

**TUSD TK CLASSROOMS, SHADE
STRUCTURES AND PLAY
APPARATUS 2024**

3595001

Tracy Unified School District
1875 W Lowell Ave., Tracy, CA 95376



May 10, 2024

**TUSD TK CLASSROOMS, SHADE STRUCTURES AND PLAY APPARATUS
2024
Tracy Unified School District
Tracy, California**

May 10, 2024

HMC # 3595001

HMC ARCHITECTS
Architect

Warren Consulting Engineers
Civil Engineer

MTW Group
Landscape Architect

BID SPEC TABLE OF CONTENTS

DSA-103s for all projects

Bid Spec for Art Freiler Elementary School - TK Portable Classroom Building

Bid Spec for Louis Bohn Elementary School - TK Portable Classroom Building

Bid Spec for Melville Jacobson Elementary School - TK Portable Classroom Building

Bid Spec for Poet-Christian Elementary School - TK Portable Classroom Building

Bid Spec for Villalovoz Elementary School - TK Portable Classroom Building

Bid Spec for Wanda Hirsch Elementary School - TK Portable Classroom Building

Bid Spec for Art Freiler Elementary School - Shade Structures and Play Apparatus

Bid Spec for Melville Jacobson Elementary School - Shade Structures and Play Apparatus

Bid Spec for George Kelly Elementary School - Shade Structures and Play Apparatus

Bid Spec for McKinley Elementary School - Shade Structures and Play Apparatus

Bid Spec for Villalovoz Elementary School - Shade Structures

Bid Spec for Wanda Hirsch Elementary School - Shade Structures

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS, 2022 CBC

General

Application Number: 02-122126	School Name: Art Freiler Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-04-11 13:47:22

IMPORTANT: This form is only a summary list of structural tests and some of the special inspections required for the project. Generally, the structural tests and special inspections noted on this form are those that will be performed by the Geotechnical Engineer of Record, Laboratory of Record, or Special Inspector. The actual complete test and inspection program must be performed as detailed on the DSA approved documents. The appendix at the bottom of this form identifies work NOT subject to DSA requirements for special inspection or structural testing. The project inspector is responsible for providing inspection of all facets of construction, including but not limited to, special inspections not listed on this form such as structural wood framing, high-load wood diaphragms, cold-formed steel framing, anchorage of non-structural components, etc., per Title 24, Part 2, Chapter 17A (2022 CBC).

****NOTE:** Undefined section and table references found in this document are from the CBC, or California Building Code.

KEY TO COLUMNS

1. TYPE	2. PERFORMED BY
Continuous – Indicates that a continuous special inspection is required	GE (Geotechnical Engineer) – Indicates that the special inspection shall be performed by a registered geotechnical engineer or his or her authorized representative.
Periodic – Indicates that a periodic special inspection is required	LOR (Laboratory of Record) – Indicates that the test or special inspection shall be performed by a testing laboratory accepted in the DSA Laboratory Evaluation and Acceptance (LEA) Program. See CAC Section 4-335.
Test – Indicates that a test is required	PI (Project Inspector) – Indicates that the special inspection may be performed by a project inspector when specifically approved by DSA.
	SI (Special Inspection) – Indicates that the special inspection shall be performed by an appropriately qualified/approved special inspector.

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (SOILS), 2022 CBC

Table 1705A.6, Table 1705A.7, Table 1705A.8

Application Number: 02-122126	School Name: Art Freiler Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-04-11 13:47:22

Geotechnical Reports: Project does NOT have and does NOT require a geotechnical report

S1. GENERAL:				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input checked="" type="checkbox"/>	a. Verify that: <ul style="list-style-type: none">• Site has been prepared properly prior to placement of controlled fill and/or excavations for foundations.• Foundation excavations are extended to proper depth and have reached proper material.• Materials below footings must not contain loose material, mud, organic silt, organic clays, or peat.	See Notes	PI	Refer to specific items identified in the Appendix listing exemptions for limitations. Placement of controlled fill exceeding 12" depth under foundations and/or within the building envelope is not permitted without a geotechnical report.

S2. SOIL COMPACTION AND FILL:				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input checked="" type="checkbox"/>	a. Perform classification and testing of fill materials.	Test	LOR*	* Under the supervision of the geotechnical engineer.
<input checked="" type="checkbox"/>	b. Verify use of proper materials, densities and inspect lift thicknesses, placement and compaction during placement of fill.	Continuous	LOR*	* Under the supervision of a geotechnical engineer or LOR's engineering manager. Refer to specific items identified in the Appendix listing exemptions for limitations.
<input checked="" type="checkbox"/>	c. Compaction testing.	Test	LOR*	* Under the supervision of a geotechnical engineer or LOR's engineering manager. Refer to specific items identified in the Appendix listing exemptions for limitations.

S3. DRIVEN DEEP FOUNDATIONS (PILES):				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Verify pile materials, sizes and lengths comply with the requirements.	Continuous	GE*	* By geotechnical engineer or his or her qualified representative.

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (SOILS), 2022 CBC

Table 1705A.6, Table 1705A.7, Table 1705A.8

Application Number: 02-122126	School Name: Art Freiler Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-04-11 13:47:22

	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	b. Determine capacities of test piles and conduct additional load tests as required.	Test	LOR*	* Under the supervision of the geotechnical engineer.
<input type="checkbox"/>	c. Inspect driving operations and maintain complete and accurate records for each pile.	Continuous	GE*	* By geotechnical engineer or his or her qualified representative.
<input type="checkbox"/>	d. Verify locations of piles and their plumbness, confirm type and size of hammer, record number of blows per foot of penetration, determine required penetrations to achieve design capacity, record tip and butt elevations and record any pile damage.	Continuous	GE*	* By geotechnical engineer or his or her qualified representative.
<input type="checkbox"/>	e. Steel piles.	Provide tests and inspections per STEEL section below.		
<input type="checkbox"/>	f. Concrete piles and concrete filled piles.	Provide tests and inspections per CONCRETE section below.		
<input type="checkbox"/>	g. For specialty piles, perform additional inspections as determined by the registered design professional in responsible charge.	*	*	* As defined on drawings or specifications.

	S4. CAST-IN-PLACE DEEP FOUNDATIONS (PIERS):			
	Test or Special Inspection	Type	Performed By	Code References and Note
<input type="checkbox"/>	a. Inspect drilling operations and maintain complete and accurate records for each pier.	Continuous	PI	Continuous inspection to be provided by project inspector. Refer to specific items identified in the Appendix listing exemptions for limitations.
<input type="checkbox"/>	b. Verify pier locations, diameters, plumbness and lengths. Record concrete or grout volumes.	Continuous	PI	Continuous inspection to be provided by project inspector. Refer to specific items identified in the Appendix listing exemptions for limitations.
<input type="checkbox"/>	c. Concrete piers.	Provide tests and inspections per CONCRETE section below.		

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (SOILS), 2022 CBC

Table 1705A.6, Table 1705A.7, Table 1705A.8

Application Number: 02-122126	School Name: Art Freiler Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-04-11 13:47:22

	Test or Special Inspection	Type	Performed By	Code References and Notes
	S5. RETAINING WALLS:			
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Placement, compaction and inspection of backfill.	Continuous	GE*	1705A.6.1. * By geotechnical engineer or his or her qualified representative. (See section S2 above).
<input type="checkbox"/>	b. Placement of soil reinforcement and/or drainage devices.	Continuous	GE*	* By geotechnical engineer or his or her qualified representative.
<input type="checkbox"/>	c. Segmental retaining walls; inspect placement of units, dowels, connectors, etc.	Continuous	GE*	* By geotechnical engineer or his or her qualified representative. See DSA IR 18-2.
<input type="checkbox"/>	d. Concrete retaining walls.	Provide tests and inspections per CONCRETE section below.		
<input type="checkbox"/>	e. Masonry retaining walls.	Provide tests and inspections per MASONRY section below.		

	S6. OTHER SOILS:			
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Soil Improvements	Test	GE*	Submit a comprehensive report documenting final soil improvements constructed, construction observation and the results of the confirmation testing and analysis to CGS (California Geological Survey) for final acceptance. * By geotechnical engineer or his or her qualified representative.
<input type="checkbox"/>	b. Inspection of Soil Improvements	Continuous	GE*	* By geotechnical engineer or his or her qualified representative.
<input type="checkbox"/>	c.			

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (CONCRETE), 2022 CBC

Table 1705A.3; ACI 318-19 Sections 26.12 & 26.13

Application Number: 02-122126	School Name: Art Freiler Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-04-11 13:47:22

C1. CAST-IN-PLACE CONCRETE				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input checked="" type="checkbox"/>	a. Verify use of required design mix.	Continuous	SI	Table 1705A.3 Item 5, 1910A.1.
<input checked="" type="checkbox"/>	b. Identify, sample, and test reinforcing steel.	Test	LOR	1910A.2; ACI 318-19 Ch.20 and Section 26.6.1.2; DSA IR 17-10. (See Appendix (end of this form) for exemptions.)
<input checked="" type="checkbox"/>	c. During concrete placement, fabricate specimens for strength tests, perform slump and air content tests, and determine the temperature of the concrete.	Test	LOR	Table 1705A.3 Item 6; ACI 318-19 Sections 26.5 & 26.12.
<input checked="" type="checkbox"/>	d. Test concrete (f' _c).	Test	LOR	1905A.1.17; ACI 318-19 Section 26.12.
<input checked="" type="checkbox"/>	e. Batch plant inspection:	See Notes	SI	Default of 'Continuous' per 1705A.3.3. If approved by DSA, batch plant inspection may be reduced to 'Periodic' subject to requirements in Section 1705A.3.3.1, or not required per 1705A.3.3.2. See IR 17-13. (See Appendix (end of this form) for exemptions.)
<input type="checkbox"/>	f. Welding of reinforcing steel.	Provide special inspection per STEEL, Category S/A4(d) & (e) and/or S/A5(g) & (h) below.		

C2. PRESTRESSED / POST-TENSIONED CONCRETE (IN ADDITION TO SECTION C1):				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Sample and test prestressing tendons and anchorages.	Test	LOR	1705A.3.4, 1910A.3
<input type="checkbox"/>	b. Inspect placement of prestressing tendons.	Periodic	SI	1705A.3.4, Table 1705A.3 Items 1 & 9.

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (CONCRETE), 2022 CBC

Table 1705A.3; ACI 318-19 Sections 26.12 & 26.13

Application Number: 02-122126	School Name: Art Freiler Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-04-11 13:47:22

	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	c. Verify in-situ concrete strength prior to stressing of post-tensioning tendons.	Periodic	SI	Table 1705A.3 Item 13. Special inspector to verify specified concrete strength test prior to stressing.
<input type="checkbox"/>	d. Inspect application of post-tensioning or prestressing forces and grouting of bonded prestressing tendons.	Continuous	SI	1705A.3.4, Table 1705A.3 Item 9; ACI 318-19 Section 26.13

	C3. PRECAST CONCRETE (IN ADDITION TO SECTION C1):			
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Inspect fabrication of precast concrete members.	Continuous	SI	ACI 318-19 Section 26.13, and PCI MNL-128 and -130.
<input type="checkbox"/>	b. Inspect erection of precast concrete members.	Periodic	SI*	Table 1705A.3 Item 10. * May be performed by PI when specifically approved by DSA.
<input type="checkbox"/>	c. For precast concrete diaphragm connections or reinforcement at joints classified as moderate or high deformability elements (MDE or HDE) in structures assigned to Seismic Design Category D, E or F, inspect such connections and reinforcement in the field for: 1. Installation of the embedded parts 2. Completion of the continuity of reinforcement across joints. 3. Completion of connections in the field.	Continuous	SI	Table 1705A.3; ACI 318-19 Section 26.13.1.3; ACI 550.5
<input type="checkbox"/>	d. Inspect installation tolerances of precast concrete diaphragm connections for compliance with ACI 550.5.	Periodic	SI	Table 1705A.3; ACI 318-19 Section 26.13.1.3; ACI 550.5

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (CONCRETE), 2022 CBC

Table 1705A.3; ACI 318-19 Sections 26.12 & 26.13

Application Number: 02-122126	School Name: Art Freiler Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-04-11 13:47:22

C4. SHOTCRETE (IN ADDITION TO SECTION C1):				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Inspect shotcrete placement for proper application techniques.	Continuous	SI	1705A.3.9, Table 1705A.3 Item 7, 1908A.1, 1908A.2, 1908A.3. See ACI 506.2-13 Section 3.4, ACI 506R-16.
<input type="checkbox"/>	b. Sample and test shotcrete (f'_c).	Test	LOR	1908A.2, 1705A.3.9

C5. POST-INSTALLED ANCHORS:				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Inspect installation of post-installed anchors	See Notes	SI*	1617A.1.19, Table 1705A.3 Item 4a (Continuous) & 4b (Periodic), 1705A.3.8 (See Appendix (end of this form) for exemptions). ACI 318-19 Section 26.13. * May be performed by the project inspector when specifically approved by DSA.
<input type="checkbox"/>	b. Test post-installed anchors.	Test	LOR	1910A.5. (See Appendix (end of this form) for exemptions.)

C6. OTHER CONCRETE:				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a.			

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (STEEL AND ALUMINUM), 2022 CBC

1705A.2.1, Table 1705A.2.1; AISC 303-16, AISC 341-16, AISC 358-16, AISC 360-16; AISI S100-20; RCSC 2014; AWS D1.1, AWS D1.2, AWS D1.3, AWS D1.4, AWS D1.8

Application Number:

02-122126

School Name:

Art Freiler Elementary School

School District:

Tracy Unified School District

DSA File Number:

39-73

Increment Number:

Date Created:

2024-04-11 13:47:22

S/A1. STRUCTURAL STEEL, COLD-FORMED STEEL AND ALUMINUM USED FOR STRUCTURAL PURPOSES				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input checked="" type="checkbox"/>	a. Verify identification of all materials and: • Mill certificates indicate material properties that comply with requirements. • Material sizes, types and grades comply with requirements.	Periodic	*	Table 1705A.2.1 Item 3a 3c. 2202A.1; AISI S100-20 Section A3.1 & A3.2, AISI S240-20 Section A3 & A5, AISI S220-20 Sections A4 & A6. * By special inspector or qualified technician when performed off-site.
<input checked="" type="checkbox"/>	b. Test unidentified materials	Test	LOR	2202A.1.
<input checked="" type="checkbox"/>	c. Examine seam welds of HSS shapes	Periodic	SI	DSA IR 17-3.
<input checked="" type="checkbox"/>	d. Verify and document steel fabrication per DSA-approved construction documents.	Periodic	SI	Not applicable to cold-formed steel light-frame construction, except for trusses (1705A.2.4).
<input type="checkbox"/>	e. Buckling restrained braces.	Test	LOR	Testing and special inspections in accordance with IR 22-4.

S/A2. HIGH-STRENGTH BOLTS:				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Verify identification markings and manufacturer's certificates of compliance conform to ASTM standards specified in the DSA-approved documents.	Periodic	SI	Table 1705A.2.1 Items 1a & 1b, 2202A.1; AISC 360-16 Section A3.3, J3.1, and N3.2; RCSC 2014 Section 1.5 & 2.1; DSA IR 17-8 & DSA IR 17-9.
<input type="checkbox"/>	b. Test high-strength bolts, nuts and washers.	Test	LOR	Table 1705A.2.1 Item 1c, 2213A.1; RCSC 2014 Section 7.2; DSA IR 17-8.
<input type="checkbox"/>	c. Bearing-type ("snug tight") connections.	Periodic	SI	Table 1705A.2.1 Item 2a, 1705A.2.6, 2204A.2; AISC 360-16 J3.1, J3.2, M2.5 & N5.6; RCSC 2014 Section 9.1; DSA IR 17-9.
<input type="checkbox"/>	d. Pretensioned and slip-critical connections.	*	SI	Table 1705A.2.1 Items 2b & 2c, 1705A.2.6, 2204A.2; AISC 360-16 J3.1, J3.2, M2.5 & N5.6; RCSC 2014 Sections 9.2 & 9.3; DSA IR 17-9. **"Continuous" or "Periodic" depends on the tightening method used.

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (STEEL AND ALUMNINUM), 2022 CBC

1705A.2.1, Table 1705A.2.1; AISC 303-16, AISC 341-16, AISC 358-16, AISC 360-16; AISI S100-20; RCSC 2014; AWS D1.1, AWS D1.2, AWS D1.3, AWS D1.4, AWS D1.8

Application Number: 02-122126	School Name: Art Freiler Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-04-11 13:47:22

S/A3. WELDING:				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input checked="" type="checkbox"/>	a. Verify weld filler material identification markings per AWS designation listed on the DSA-approved documents and the WPS.	Periodic	SI	1705A.2.5, Table 1705A.2.1 Items 4 & 5; AWS D1.1 and AWS D1.8 for structural steel; AWS D1.2 for Aluminum; AWS D1.3 for cold-formed steel; AWS D1.4 for reinforcing steel; DSA IR 17-3.
<input checked="" type="checkbox"/>	b. Verify weld filler material manufacturer's certificate of compliance.	Periodic	SI	DSA IR 17-3.
<input checked="" type="checkbox"/>	c. Verify WPS, welder qualifications and equipment.	Periodic	SI	DSA IR 17-3.

S/A4. SHOP WELDING (IN ADDITION TO SECTION S/A3):				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input checked="" type="checkbox"/>	a. Inspect groove welds, multi-pass fillet welds, single pass fillet welds > 5/16", plug and slot welds.	Continuous	SI	Table 1705A.2.1 Items 5a.1 4; AISC 360-16 (and AISC 341-16 as applicable); DSA IR 17-3.
<input checked="" type="checkbox"/>	b. Inspect single-pass fillet welds ≤ 5/16", floor and roof deck welds.	Periodic	SI	1705A.2.2, Table 1705A.2.1 Items 5a.5 & 5a.6; AISC 360-16 (and AISC 341-16 as applicable); DSA IR 17-3.
<input type="checkbox"/>	c. Inspect welding of stairs and railing systems.	Periodic	SI	1705A.2.1; AISC 360-16 (and AISC 341-16 as applicable); AWS D1.1 & D1.3; DSA IR 17-3.
<input type="checkbox"/>	d. Verification of reinforcing steel weldability other than ASTM A706.	Periodic	SI	1705A.3.1; AWS D1.4; DSA IR 17-3. Verify carbon equivalent reported on mill certificates.
<input type="checkbox"/>	e. Inspect welding of reinforcing steel.	Continuous	SI	Table 1705A.2.1 Item 5b, 1705A.3.1, Table 1705A.3 Item 2, 1903A.8; AWS D1.4; DSA IR 17-3.

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (STEEL AND ALUMNINUM), 2022 CBC

1705A.2.1, Table 1705A.2.1; AISC 303-16, AISC 341-16, AISC 358-16, AISC 360-16; AISI S100-20; RCSC 2014; AWS D1.1, AWS D1.2, AWS D1.3, AWS D1.4, AWS D1.8

Application Number: 02-122126	School Name: Art Freiler Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-04-11 13:47:22

	Test or Special Inspection	Type	Performed By	Code References and Notes
	S/A5. FIELD WELDING (IN ADDITION TO SECTION S/A3):			
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input checked="" type="checkbox"/>	a. Inspect groove welds, multi-pass fillet welds, single pass fillet welds > 5/16", plug and slot welds.	Continuous	SI	Table 1705A.2.1 Items 5a.1 4; AISC 360-16 (AISC 341-16 as applicable); DSA IR 17-3.
<input type="checkbox"/>	b. Inspect single-pass fillet welds ≤ 5/16".	Periodic	SI	Table 1705A.2.1 Item 5a.5; AISC 360-16 (AISC 341-16 as applicable); DSA IR 17-3.
<input type="checkbox"/>	c. Inspect end-welded studs (ASTM A-108) installation (including bend test).	Periodic	SI	2213A.2; AISC 360-16 (AISC 341-16 as applicable); AWS D1.1; DSA IR 17-3.
<input type="checkbox"/>	d. Inspect floor and roof deck welds.	Periodic	SI	1705A.2.2, Table 1705A.2.1 Item 5a.6; AISC 360-16 (AISC 341-16 as applicable); AWS D1.3; DSA IR 17-3.
<input type="checkbox"/>	e. Inspect welding of structural cold-formed steel.	Periodic	SI*	1705A.2.5; AWS D1.3; DSA IR 17-3. The quality control provisions of AISI S240-20 Chapter D shall also apply. * May be performed by the project inspector when specifically approved by DSA.
<input type="checkbox"/>	f. Inspect welding of stairs and railing systems.	Periodic	SI*	1705A.2.1; AISC 360-16 (AISC 341-16 as applicable); AWS D1.1 & D1.3; DSA IR 17-3. * May be performed by the project inspector when specifically approved by DSA.
<input type="checkbox"/>	g. Verification of reinforcing steel weldability.	Periodic	SI	1705A.3.1; AWS D1.4; DSA IR 17-3. Verify carbon equivalent reported on mill certificates.
<input type="checkbox"/>	h. Inspect welding of reinforcing steel.	Continuous	SI	Table 1705A.2.1 Item 5b, 1705A.3.1, Table 1705A.3 Item 2, 1903A.8; AWS D1.4; DSA IR 17-3.

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (STEEL AND ALUMNINUM), 2022 CBC

1705A.2.1, Table 1705A.2.1; AISC 303-16, AISC 341-16, AISC 358-16, AISC 360-16; AISI S100-20; RCSC 2014; AWS D1.1, AWS D1.2, AWS D1.3, AWS D1.4, AWS D1.8

Application Number:

02-122126

School Name:

Art Freiler Elementary School

School District:

Tracy Unified School District

DSA File Number:

39-73

Increment Number:

Date Created:

2024-04-11 13:47:22

	Test or Special Inspection	Type	Performed By	Code References and Notes
	S/A6. NONDESTRUCTIVE TESTING:			
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Ultrasonic	Test	LOR	1705A.2.1, 1705A.2.5; AISC 341-16 J6.2, AISC 360-16 N5.5; AWS D1.1, AWS D1.8; DSA IR 17-2.
<input checked="" type="checkbox"/>	b. Magnetic Particle	Test	LOR	1705A.2.1, 1705A.2.5; AISC 341-16 J6.2, AISC 360-16 N5.5; AWS D1.1, AWS D1.8; DSA IR 17-2.
<input type="checkbox"/>	c.	Test	LOR	

	S/A7. STEEL JOISTS AND TRUSSES:			
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Verify size, type and grade for all chord and web members as well as connectors and weld filler material; verify joist profile, dimensions and camber (if applicable); verify all weld locations, lengths and profiles; mark or tag each joist.	Continuous	SI	1705A.2.3, Table 1705A.2.3; AWS D1.1; DSA IR 22-3 for steel joists only. 1705A.2.4; AWS D1.3 for cold-formed steel trusses.

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (STEEL AND ALUMNINUM), 2022 CBC

1705A.2.1, Table 1705A.2.1; AISC 303-16, AISC 341-16, AISC 358-16, AISC 360-16; AISI S100-20; RCSC 2014; AWS D1.1, AWS D1.2, AWS D1.3, AWS D1.4, AWS D1.8

Application Number: 02-122126	School Name: Art Freiler Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-04-11 13:47:22

	Test or Special Inspection	Type	Performed By	Code References and Notes
	S/A8. SPRAYED FIRE-RESISTANT MATERIALS:			
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Examine structural steel surface conditions, inspect application, take samples, measure thickness and verify compliance of all aspects of application with DSA-approved documents.	Periodic	SI	1705A.15, 1705A.15.1, 1705A.15.2, 1705A.15.3, 1705A.15.4, 1705A.15.5, 1705A.15.6.
<input type="checkbox"/>	b. Test density.	Test	LOR	1705A.15.1, 1705A.15.5, ASTM E605
<input type="checkbox"/>	c. Bond strength adhesion/cohesion.	Test	LOR	1705A.15.1, 1705A.15.6, ASTM E736

	S/A9. ANCHOR BOLTS AND ANCHOR RODS:			
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Anchor Bolts and Anchor Rods	Test	LOR	Identify, sample and test anchor bolts and anchor rods not meeting exemptions identified in Section 1 of IR 17-11.
<input type="checkbox"/>	b. Threaded rod not used for foundation anchorage.	Test	LOR	Identify, sample and test threaded rods not meeting exemptions identified in Section 1 of IR 17-11.

	S/A10. STORAGE RACK SYSTEMS:			
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Materials used, to verify compliance with one or more of the material test reports in accordance with the approved construction documents.	Periodic	SI	Table 1705A.13.7
<input type="checkbox"/>	b. Fabricated storage rack elements.	Periodic	SI	1704A.2.5; Table 1705A.13.7

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (STEEL AND ALUMNINUM), 2022 CBC

1705A.2.1, Table 1705A.2.1; AISC 303-16, AISC 341-16, AISC 358-16, AISC 360-16; AISI S100-20; RCSC 2014; AWS D1.1, AWS D1.2, AWS D1.3, AWS D1.4, AWS D1.8

Application Number:

02-122126

School Name:

Art Freiler Elementary School

School District:

Tracy Unified School District

DSA File Number:

39-73

Increment Number:

Date Created:

2024-04-11 13:47:22

	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	c. Storage rack anchorage installation.	Periodic	SI	ANSI/MH16.1 Section 7.3.2; Table 1705A.13.7
<input type="checkbox"/>	d. Completed storage rack system to indicate compliance with the approved construction documents.	Periodic	SI*	Table 1705A.13.7; * May be preformed by the project inspector when specifically approved by DSA.

	S/A11. Other Steel			
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input checked="" type="checkbox"/>	a. Shop Welding-inspect welding of cold-formed steel periodic/special inspector	Periodic	SI	
<input checked="" type="checkbox"/>	b. Hollow bolts	Continuous	PI	Verify the torque installation torque

Appendix: Work Exempt from DSA Requirements for Structural Tests / Special Inspections

Application Number: 02-122126	School Name: Art Freiler Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-04-11 13:47:22

Exempt items given in DSA IR A-22 or the 2022 CBC (including DSA amendments) and those items identified below with a check mark by the design professional are NOT subject to DSA requirements for the structural tests / special inspections noted. **Items marked as exempt shall be identified on the approved construction documents.** The project inspector shall verify all construction complies with the approved construction documents.

	SOILS:
<input type="checkbox"/>	1. Deep foundations acting as a cantilever footing with a design based on minimum allowable pressures per CBC Table 1806A.2 and without a geotechnical report for the following cases: A) free standing sign or scoreboard, B) cell or antenna towers and poles less than 35'-0" tall (e.g., lighting poles, flag poles, poles supporting open mesh fences, etc.), C) single-story structure with dead load less than 5 psf (e.g., open fabric shade structure), or D) covered walkway structure with an apex height less than 10'-0" above adjacent grade.
<input type="checkbox"/>	2. Shallow foundations, etc. are exempt from special inspections and testing by a Geotechnical Engineer for the following cases: A) buildings without a geotechnical report and meeting the exception item #1 criteria in CBC Section 1803A.2 supported by native soil (any excavation depth) or fill soil (not exceeding 12" depth per CBC Section 1804A.6), B) soil scarification/recompaction not exceeding 12" depth, C) native or fill soil supporting exterior non-structural flatwork (e.g., sidewalks, site concrete ramps, site stairs, parking lots, driveways, etc.), D) unpaved landscaping and playground areas, or E) utility trench backfill with depth not exceeding 12".

	CONCRETE/MASONRY:
<input checked="" type="checkbox"/>	1. Post-installed anchors for the following: A) exempt non-structural components (e.g., mechanical, electrical, plumbing equipment - see item 7 for "Welding" in the Appendix below) given in CBC Section 1617A.1.18 (which replaces ASCE 7-16, Section 13.1.4) or B) interior nonstructural wall partitions meeting criteria listed in exempt item 3 for "Welding" in the Appendix below
<input checked="" type="checkbox"/>	2. Concrete batch plant inspection is not required for items given in CBC Section 1705A.3.3.2 subject to the requirements and limitations in that section.
<input type="checkbox"/>	3. Non-bearing non-shear masonry walls may be exempt from certain DSA masonry testing and special inspection items as allowed per DSA IR 21-1. Refer to construction documents for specific exemptions accordingly for each applicable wall condition shown in Appendix A of IR 21-1.
<input checked="" type="checkbox"/>	4. Epoxy shear dowels in site flatwork and/or other non-structural concrete.

Appendix: Work Exempt from DSA Requirements for Structural Tests / Special Inspections

Application Number: 02-122126	School Name: Art Freiler Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-04-11 13:47:22

	CONCRETE/MASONRY:
<input type="checkbox"/>	5. Testing of reinforcing bars is not required for items given in CBC Section 1910A.2 subject to the requirements and limitations in that section.

	WELDING:
<input type="checkbox"/>	1. Solid-clad and open-mesh fences, gates with maximum leaf span of 10', and gates with a maximum rolling section of 10' all having an apex height less than 8'-0" above lowest adjacent grade. When located above circulation or occupied space below, these gates/fences are not located within 1.5x gate/fence height (max 8'-0") to the edge of floor or roof.
<input type="checkbox"/>	2. Handrails, guardrails, and modular or relocatable ramps associated with walking surfaces less than 30" above adjacent grade (excluding post base connections per the 'Exception' language in Section 1705A.2.1); fillet welds shall not be ground flush.
<input type="checkbox"/>	3. Non-structural interior cold-formed steel framing spanning less than 15'-0", such as in interior partitions, interior soffits, etc. supporting only self weight and light-weight finishes or adhered tile, masonry, stone, or terra cotta veneer no more than 5/8" thickness and apex less than 20'-0" in height and not over an exit way. Maximum tributary load to a member shall not exceed the equivalent of that occurring from a 10'x10' opening in a 15' tall wall for a header or king stud.
<input type="checkbox"/>	4. Manufactured support frames and curbs using hot rolled or cold-formed steel (i.e., light gauge) for mechanical, electrical, or plumbing equipment weighing less than 2000# (equipment only) (connections of such frames to superstructure elements using welding will require special inspection as noted in selected item(s) for Sections S/A3, S/A4 and/or S/A5 of listing above).
<input type="checkbox"/>	5. Manufactured components (e.g., Tolco, B-Line, Afcon, etc.) for mechanical, electrical, or plumbing hanger support and bracing (connections of such components to superstructure elements using welding will require special inspection as noted in selected item(s) for Sections S/A3, S/A4 and/or S/A5 of listing above).
<input type="checkbox"/>	6. TV Brackets, projector mounts with a valid listing (see DSA IR A-5) and recreational equipment (e.g., playground structures, basketball backstops, etc.) (connections of such elements to superstructure elements using welding will require special inspection as noted in selected item(s) for sections S/A3, S/A4 and/or S/A5 located in the Steel/Aluminum category of listing above).

Appendix: Work Exempt from DSA Requirements for Structural Tests / Special Inspections

Application Number: 02-122126	School Name: Art Freiler Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-04-11 13:47:22

	WELDING:
<input type="checkbox"/>	7. Any support for exempt non-structural components given in CBC Section 1617A.1.18 (which replaces ASCE 7-16, Section 13.1.4) meeting the following: A) when supported on a floor/roof, <400# and resulting composite center of mass (including component's center of mass) $\leq 4'$ above supporting floor/roof, B) when hung from a wall or roof/floor, <20# for discrete units or <5 plf for distributed systems.

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS(SIGNATURE), 2022 CBC

Application Number:

02-122126

School Name:

Art Freiler Elementary School

School District:

Tracy Unified School District

DSA File Number:

39-73

Increment Number:

Date Created:

2024-04-11 13:47:22

Name of Architect or Engineer in general responsible charge:

Jeffrey Grau

Name of Structural Engineer (When structural design has been delegated):

Signature of Architect or Structural Engineer:

Date:

04/11/24

Note: To facilitate DSA electronic mark-ups and identification stamp application, DSA recommends against using secured electronic or digital signatures.

DSA STAMP

IDENTIFICATION STAMP
DIV. OF THE STATE ARCHITECT
APP: 02-121126 INC:
REVIEWED FOR
SS ☒ FLS ☒ ACS ☒
DATE: 04/17/2024

DSA 103-22: LIST OF REQUIRED VERIFIED REPORTS, CBC 2022

Application Number:

02-122126

DSA File Number:

39-73

School Name:

Art Freiler Elementary School

Increment Number:

School District:

Tracy Unified School District

Date Created:

2024-04-11 13:47:22

1. Structural Testing and Inspection: Laboratory Verified Report Form DSA 291

2. Shop Welding Inspection: Laboratory Verified Report Form DSA 291, or, for independently contracting SI, Special Inspection Verified Report Form DSA 292

3. Field Welding Inspection: Laboratory Verified Report Form DSA 291, or, for independently contracting SI, Special Inspection Verified Report Form DSA 292

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS, 2022 CBC

General

Application Number: 02-122127	School Name: Louis Bohn Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-04-11 13:57:37

IMPORTANT: This form is only a summary list of structural tests and some of the special inspections required for the project. Generally, the structural tests and special inspections noted on this form are those that will be performed by the Geotechnical Engineer of Record, Laboratory of Record, or Special Inspector. The actual complete test and inspection program must be performed as detailed on the DSA approved documents. The appendix at the bottom of this form identifies work NOT subject to DSA requirements for special inspection or structural testing. The project inspector is responsible for providing inspection of all facets of construction, including but not limited to, special inspections not listed on this form such as structural wood framing, high-load wood diaphragms, cold-formed steel framing, anchorage of non-structural components, etc., per Title 24, Part 2, Chapter 17A (2022 CBC).

****NOTE:** Undefined section and table references found in this document are from the CBC, or California Building Code.

KEY TO COLUMNS

1. TYPE	2. PERFORMED BY
Continuous – Indicates that a continuous special inspection is required	GE (Geotechnical Engineer) – Indicates that the special inspection shall be performed by a registered geotechnical engineer or his or her authorized representative.
Periodic – Indicates that a periodic special inspection is required	LOR (Laboratory of Record) – Indicates that the test or special inspection shall be performed by a testing laboratory accepted in the DSA Laboratory Evaluation and Acceptance (LEA) Program. See CAC Section 4-335.
Test – Indicates that a test is required	PI (Project Inspector) – Indicates that the special inspection may be performed by a project inspector when specifically approved by DSA.
	SI (Special Inspection) – Indicates that the special inspection shall be performed by an appropriately qualified/approved special inspector.

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (SOILS), 2022 CBC

Table 1705A.6, Table 1705A.7, Table 1705A.8

Application Number: 02-122127	School Name: Louis Bohn Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-04-11 13:57:37

Geotechnical Reports: Project does NOT have and does NOT require a geotechnical report

S1. GENERAL:				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input checked="" type="checkbox"/>	a. Verify that: <ul style="list-style-type: none">• Site has been prepared properly prior to placement of controlled fill and/or excavations for foundations.• Foundation excavations are extended to proper depth and have reached proper material.• Materials below footings must not contain loose material, mud, organic silt, organic clays, or peat.	See Notes	PI	Refer to specific items identified in the Appendix listing exemptions for limitations. Placement of controlled fill exceeding 12" depth under foundations and/or within the building envelope is not permitted without a geotechnical report.

S2. SOIL COMPACTION AND FILL:				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input checked="" type="checkbox"/>	a. Perform classification and testing of fill materials.	Test	LOR*	* Under the supervision of the geotechnical engineer.
<input checked="" type="checkbox"/>	b. Verify use of proper materials, densities and inspect lift thicknesses, placement and compaction during placement of fill.	Continuous	LOR*	* Under the supervision of a geotechnical engineer or LOR's engineering manager. Refer to specific items identified in the Appendix listing exemptions for limitations.
<input checked="" type="checkbox"/>	c. Compaction testing.	Test	LOR*	* Under the supervision of a geotechnical engineer or LOR's engineering manager. Refer to specific items identified in the Appendix listing exemptions for limitations.

S3. DRIVEN DEEP FOUNDATIONS (PILES):				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Verify pile materials, sizes and lengths comply with the requirements.	Continuous	GE*	* By geotechnical engineer or his or her qualified representative.

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (SOILS), 2022 CBC

Table 1705A.6, Table 1705A.7, Table 1705A.8

Application Number: 02-122127	School Name: Louis Bohn Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-04-11 13:57:37

	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	b. Determine capacities of test piles and conduct additional load tests as required.	Test	LOR*	* Under the supervision of the geotechnical engineer.
<input type="checkbox"/>	c. Inspect driving operations and maintain complete and accurate records for each pile.	Continuous	GE*	* By geotechnical engineer or his or her qualified representative.
<input type="checkbox"/>	d. Verify locations of piles and their plumbness, confirm type and size of hammer, record number of blows per foot of penetration, determine required penetrations to achieve design capacity, record tip and butt elevations and record any pile damage.	Continuous	GE*	* By geotechnical engineer or his or her qualified representative.
<input type="checkbox"/>	e. Steel piles.	Provide tests and inspections per STEEL section below.		
<input type="checkbox"/>	f. Concrete piles and concrete filled piles.	Provide tests and inspections per CONCRETE section below.		
<input type="checkbox"/>	g. For specialty piles, perform additional inspections as determined by the registered design professional in responsible charge.	*	*	* As defined on drawings or specifications.

	S4. CAST-IN-PLACE DEEP FOUNDATIONS (PIERS):			
	Test or Special Inspection	Type	Performed By	Code References and Note
<input type="checkbox"/>	a. Inspect drilling operations and maintain complete and accurate records for each pier.	Continuous	PI	Continuous inspection to be provided by project inspector. Refer to specific items identified in the Appendix listing exemptions for limitations.
<input type="checkbox"/>	b. Verify pier locations, diameters, plumbness and lengths. Record concrete or grout volumes.	Continuous	PI	Continuous inspection to be provided by project inspector. Refer to specific items identified in the Appendix listing exemptions for limitations.
<input type="checkbox"/>	c. Concrete piers.	Provide tests and inspections per CONCRETE section below.		

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (SOILS), 2022 CBC

Table 1705A.6, Table 1705A.7, Table 1705A.8

Application Number: 02-122127	School Name: Louis Bohn Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-04-11 13:57:37

	Test or Special Inspection	Type	Performed By	Code References and Notes
	S5. RETAINING WALLS:			
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Placement, compaction and inspection of backfill.	Continuous	GE*	1705A.6.1. * By geotechnical engineer or his or her qualified representative. (See section S2 above).
<input type="checkbox"/>	b. Placement of soil reinforcement and/or drainage devices.	Continuous	GE*	* By geotechnical engineer or his or her qualified representative.
<input type="checkbox"/>	c. Segmental retaining walls; inspect placement of units, dowels, connectors, etc.	Continuous	GE*	* By geotechnical engineer or his or her qualified representative. See DSA IR 18-2.
<input type="checkbox"/>	d. Concrete retaining walls.	Provide tests and inspections per CONCRETE section below.		
<input type="checkbox"/>	e. Masonry retaining walls.	Provide tests and inspections per MASONRY section below.		

	S6. OTHER SOILS:			
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Soil Improvements	Test	GE*	Submit a comprehensive report documenting final soil improvements constructed, construction observation and the results of the confirmation testing and analysis to CGS (California Geological Survey) for final acceptance. * By geotechnical engineer or his or her qualified representative.
<input type="checkbox"/>	b. Inspection of Soil Improvements	Continuous	GE*	* By geotechnical engineer or his or her qualified representative.
<input type="checkbox"/>	c.			

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (CONCRETE), 2022 CBC

Table 1705A.3; ACI 318-19 Sections 26.12 & 26.13

Application Number: 02-122127	School Name: Louis Bohn Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-04-11 13:57:37

C1. CAST-IN-PLACE CONCRETE				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input checked="" type="checkbox"/>	a. Verify use of required design mix.	Continuous	SI	Table 1705A.3 Item 5, 1910A.1.
<input checked="" type="checkbox"/>	b. Identify, sample, and test reinforcing steel.	Test	LOR	1910A.2; ACI 318-19 Ch.20 and Section 26.6.1.2; DSA IR 17-10. (See Appendix (end of this form) for exemptions.)
<input checked="" type="checkbox"/>	c. During concrete placement, fabricate specimens for strength tests, perform slump and air content tests, and determine the temperature of the concrete.	Test	LOR	Table 1705A.3 Item 6; ACI 318-19 Sections 26.5 & 26.12.
<input checked="" type="checkbox"/>	d. Test concrete (f' _c).	Test	LOR	1905A.1.17; ACI 318-19 Section 26.12.
<input checked="" type="checkbox"/>	e. Batch plant inspection:	See Notes	SI	Default of 'Continuous' per 1705A.3.3. If approved by DSA, batch plant inspection may be reduced to 'Periodic' subject to requirements in Section 1705A.3.3.1, or not required per 1705A.3.3.2. See IR 17-13. (See Appendix (end of this form) for exemptions.)
<input type="checkbox"/>	f. Welding of reinforcing steel.	Provide special inspection per STEEL, Category S/A4(d) & (e) and/or S/A5(g) & (h) below.		

C2. PRESTRESSED / POST-TENSIONED CONCRETE (IN ADDITION TO SECTION C1):				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Sample and test prestressing tendons and anchorages.	Test	LOR	1705A.3.4, 1910A.3
<input type="checkbox"/>	b. Inspect placement of prestressing tendons.	Periodic	SI	1705A.3.4, Table 1705A.3 Items 1 & 9.

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (CONCRETE), 2022 CBC

Table 1705A.3; ACI 318-19 Sections 26.12 & 26.13

Application Number: 02-122127	School Name: Louis Bohn Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-04-11 13:57:37

	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	c. Verify in-situ concrete strength prior to stressing of post-tensioning tendons.	Periodic	SI	Table 1705A.3 Item 13. Special inspector to verify specified concrete strength test prior to stressing.
<input type="checkbox"/>	d. Inspect application of post-tensioning or prestressing forces and grouting of bonded prestressing tendons.	Continuous	SI	1705A.3.4, Table 1705A.3 Item 9; ACI 318-19 Section 26.13

	C3. PRECAST CONCRETE (IN ADDITION TO SECTION C1):			
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Inspect fabrication of precast concrete members.	Continuous	SI	ACI 318-19 Section 26.13, and PCI MNL-128 and -130.
<input type="checkbox"/>	b. Inspect erection of precast concrete members.	Periodic	SI*	Table 1705A.3 Item 10. * May be performed by PI when specifically approved by DSA.
<input type="checkbox"/>	c. For precast concrete diaphragm connections or reinforcement at joints classified as moderate or high deformability elements (MDE or HDE) in structures assigned to Seismic Design Category D, E or F, inspect such connections and reinforcement in the field for: 1. Installation of the embedded parts 2. Completion of the continuity of reinforcement across joints. 3. Completion of connections in the field.	Continuous	SI	Table 1705A.3; ACI 318-19 Section 26.13.1.3; ACI 550.5
<input type="checkbox"/>	d. Inspect installation tolerances of precast concrete diaphragm connections for compliance with ACI 550.5.	Periodic	SI	Table 1705A.3; ACI 318-19 Section 26.13.1.3; ACI 550.5

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (CONCRETE), 2022 CBC

Table 1705A.3; ACI 318-19 Sections 26.12 & 26.13

Application Number: 02-122127	School Name: Louis Bohn Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-04-11 13:57:37

C4. SHOTCRETE (IN ADDITION TO SECTION C1):				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Inspect shotcrete placement for proper application techniques.	Continuous	SI	1705A.3.9, Table 1705A.3 Item 7, 1908A.1, 1908A.2, 1908A.3. See ACI 506.2-13 Section 3.4, ACI 506R-16.
<input type="checkbox"/>	b. Sample and test shotcrete (f'_c).	Test	LOR	1908A.2, 1705A.3.9

C5. POST-INSTALLED ANCHORS:				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Inspect installation of post-installed anchors	See Notes	SI*	1617A.1.19, Table 1705A.3 Item 4a (Continuous) & 4b (Periodic), 1705A.3.8 (See Appendix (end of this form) for exemptions). ACI 318-19 Section 26.13. * May be performed by the project inspector when specifically approved by DSA.
<input type="checkbox"/>	b. Test post-installed anchors.	Test	LOR	1910A.5. (See Appendix (end of this form) for exemptions.)

C6. OTHER CONCRETE:				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a.			

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (STEEL AND ALUMINUM), 2022 CBC

1705A.2.1, Table 1705A.2.1; AISC 303-16, AISC 341-16, AISC 358-16, AISC 360-16; AISI S100-20; RCSC 2014; AWS D1.1, AWS D1.2, AWS D1.3, AWS D1.4, AWS D1.8

Application Number:

02-122127

School Name:

Louis Bohn Elementary School

School District:

Tracy Unified School District

DSA File Number:

39-73

Increment Number:

Date Created:

2024-04-11 13:57:37

S/A1. STRUCTURAL STEEL, COLD-FORMED STEEL AND ALUMINUM USED FOR STRUCTURAL PURPOSES				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input checked="" type="checkbox"/>	a. Verify identification of all materials and: • Mill certificates indicate material properties that comply with requirements. • Material sizes, types and grades comply with requirements.	Periodic	*	Table 1705A.2.1 Item 3a 3c. 2202A.1; AISI S100-20 Section A3.1 & A3.2, AISI S240-20 Section A3 & A5, AISI S220-20 Sections A4 & A6. * By special inspector or qualified technician when performed off-site.
<input checked="" type="checkbox"/>	b. Test unidentified materials	Test	LOR	2202A.1.
<input checked="" type="checkbox"/>	c. Examine seam welds of HSS shapes	Periodic	SI	DSA IR 17-3.
<input checked="" type="checkbox"/>	d. Verify and document steel fabrication per DSA-approved construction documents.	Periodic	SI	Not applicable to cold-formed steel light-frame construction, except for trusses (1705A.2.4).
<input type="checkbox"/>	e. Buckling restrained braces.	Test	LOR	Testing and special inspections in accordance with IR 22-4.

S/A2. HIGH-STRENGTH BOLTS:				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Verify identification markings and manufacturer's certificates of compliance conform to ASTM standards specified in the DSA-approved documents.	Periodic	SI	Table 1705A.2.1 Items 1a & 1b, 2202A.1; AISC 360-16 Section A3.3, J3.1, and N3.2; RCSC 2014 Section 1.5 & 2.1; DSA IR 17-8 & DSA IR 17-9.
<input type="checkbox"/>	b. Test high-strength bolts, nuts and washers.	Test	LOR	Table 1705A.2.1 Item 1c, 2213A.1; RCSC 2014 Section 7.2; DSA IR 17-8.
<input type="checkbox"/>	c. Bearing-type ("snug tight") connections.	Periodic	SI	Table 1705A.2.1 Item 2a, 1705A.2.6, 2204A.2; AISC 360-16 J3.1, J3.2, M2.5 & N5.6; RCSC 2014 Section 9.1; DSA IR 17-9.
<input type="checkbox"/>	d. Pretensioned and slip-critical connections.	*	SI	Table 1705A.2.1 Items 2b & 2c, 1705A.2.6, 2204A.2; AISC 360-16 J3.1, J3.2, M2.5 & N5.6; RCSC 2014 Sections 9.2 & 9.3; DSA IR 17-9. **"Continuous" or "Periodic" depends on the tightening method used.

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (STEEL AND ALUMNINUM), 2022 CBC

1705A.2.1, Table 1705A.2.1; AISC 303-16, AISC 341-16, AISC 358-16, AISC 360-16; AISI S100-20; RCSC 2014; AWS D1.1, AWS D1.2, AWS D1.3, AWS D1.4, AWS D1.8

Application Number: 02-122127	School Name: Louis Bohn Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-04-11 13:57:37

S/A3. WELDING:				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input checked="" type="checkbox"/>	a. Verify weld filler material identification markings per AWS designation listed on the DSA-approved documents and the WPS.	Periodic	SI	1705A.2.5, Table 1705A.2.1 Items 4 & 5; AWS D1.1 and AWS D1.8 for structural steel; AWS D1.2 for Aluminum; AWS D1.3 for cold-formed steel; AWS D1.4 for reinforcing steel; DSA IR 17-3.
<input checked="" type="checkbox"/>	b. Verify weld filler material manufacturer's certificate of compliance.	Periodic	SI	DSA IR 17-3.
<input checked="" type="checkbox"/>	c. Verify WPS, welder qualifications and equipment.	Periodic	SI	DSA IR 17-3.

S/A4. SHOP WELDING (IN ADDITION TO SECTION S/A3):				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input checked="" type="checkbox"/>	a. Inspect groove welds, multi-pass fillet welds, single pass fillet welds > 5/16", plug and slot welds.	Continuous	SI	Table 1705A.2.1 Items 5a.1 4; AISC 360-16 (and AISC 341-16 as applicable); DSA IR 17-3.
<input checked="" type="checkbox"/>	b. Inspect single-pass fillet welds ≤ 5/16", floor and roof deck welds.	Periodic	SI	1705A.2.2, Table 1705A.2.1 Items 5a.5 & 5a.6; AISC 360-16 (and AISC 341-16 as applicable); DSA IR 17-3.
<input type="checkbox"/>	c. Inspect welding of stairs and railing systems.	Periodic	SI	1705A.2.1; AISC 360-16 (and AISC 341-16 as applicable); AWS D1.1 & D1.3; DSA IR 17-3.
<input type="checkbox"/>	d. Verification of reinforcing steel weldability other than ASTM A706.	Periodic	SI	1705A.3.1; AWS D1.4; DSA IR 17-3. Verify carbon equivalent reported on mill certificates.
<input type="checkbox"/>	e. Inspect welding of reinforcing steel.	Continuous	SI	Table 1705A.2.1 Item 5b, 1705A.3.1, Table 1705A.3 Item 2, 1903A.8; AWS D1.4; DSA IR 17-3.

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (STEEL AND ALUMNINUM), 2022 CBC

1705A.2.1, Table 1705A.2.1; AISC 303-16, AISC 341-16, AISC 358-16, AISC 360-16; AISI S100-20; RCSC 2014; AWS D1.1, AWS D1.2, AWS D1.3, AWS D1.4, AWS D1.8

Application Number: 02-122127	School Name: Louis Bohn Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-04-11 13:57:37

	Test or Special Inspection	Type	Performed By	Code References and Notes
	S/A5. FIELD WELDING (IN ADDITION TO SECTION S/A3):			
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input checked="" type="checkbox"/>	a. Inspect groove welds, multi-pass fillet welds, single pass fillet welds > 5/16", plug and slot welds.	Continuous	SI	Table 1705A.2.1 Items 5a.1 4; AISC 360-16 (AISC 341-16 as applicable); DSA IR 17-3.
<input type="checkbox"/>	b. Inspect single-pass fillet welds ≤ 5/16".	Periodic	SI	Table 1705A.2.1 Item 5a.5; AISC 360-16 (AISC 341-16 as applicable); DSA IR 17-3.
<input type="checkbox"/>	c. Inspect end-welded studs (ASTM A-108) installation (including bend test).	Periodic	SI	2213A.2; AISC 360-16 (AISC 341-16 as applicable); AWS D1.1; DSA IR 17-3.
<input type="checkbox"/>	d. Inspect floor and roof deck welds.	Periodic	SI	1705A.2.2, Table 1705A.2.1 Item 5a.6; AISC 360-16 (AISC 341-16 as applicable); AWS D1.3; DSA IR 17-3.
<input type="checkbox"/>	e. Inspect welding of structural cold-formed steel.	Periodic	SI*	1705A.2.5; AWS D1.3; DSA IR 17-3. The quality control provisions of AISI S240-20 Chapter D shall also apply. * May be performed by the project inspector when specifically approved by DSA.
<input type="checkbox"/>	f. Inspect welding of stairs and railing systems.	Periodic	SI*	1705A.2.1; AISC 360-16 (AISC 341-16 as applicable); AWS D1.1 & D1.3; DSA IR 17-3. * May be performed by the project inspector when specifically approved by DSA.
<input type="checkbox"/>	g. Verification of reinforcing steel weldability.	Periodic	SI	1705A.3.1; AWS D1.4; DSA IR 17-3. Verify carbon equivalent reported on mill certificates.
<input type="checkbox"/>	h. Inspect welding of reinforcing steel.	Continuous	SI	Table 1705A.2.1 Item 5b, 1705A.3.1, Table 1705A.3 Item 2, 1903A.8; AWS D1.4; DSA IR 17-3.

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (STEEL AND ALUMNINUM), 2022 CBC

1705A.2.1, Table 1705A.2.1; AISC 303-16, AISC 341-16, AISC 358-16, AISC 360-16; AISI S100-20; RCSC 2014; AWS D1.1, AWS D1.2, AWS D1.3, AWS D1.4, AWS D1.8

Application Number:

02-122127

School Name:

Louis Bohn Elementary School

School District:

Tracy Unified School District

DSA File Number:

39-73

Increment Number:

Date Created:

2024-04-11 13:57:37

	Test or Special Inspection	Type	Performed By	Code References and Notes
	S/A6. NONDESTRUCTIVE TESTING:			
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Ultrasonic	Test	LOR	1705A.2.1, 1705A.2.5; AISC 341-16 J6.2, AISC 360-16 N5.5; AWS D1.1, AWS D1.8; DSA IR 17-2.
<input checked="" type="checkbox"/>	b. Magnetic Particle	Test	LOR	1705A.2.1, 1705A.2.5; AISC 341-16 J6.2, AISC 360-16 N5.5; AWS D1.1, AWS D1.8; DSA IR 17-2.
<input type="checkbox"/>	c.	Test	LOR	

	S/A7. STEEL JOISTS AND TRUSSES:			
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Verify size, type and grade for all chord and web members as well as connectors and weld filler material; verify joist profile, dimensions and camber (if applicable); verify all weld locations, lengths and profiles; mark or tag each joist.	Continuous	SI	1705A.2.3, Table 1705A.2.3; AWS D1.1; DSA IR 22-3 for steel joists only. 1705A.2.4; AWS D1.3 for cold-formed steel trusses.

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (STEEL AND ALUMNINUM), 2022 CBC

1705A.2.1, Table 1705A.2.1; AISC 303-16, AISC 341-16, AISC 358-16, AISC 360-16; AISI S100-20; RCSC 2014; AWS D1.1, AWS D1.2, AWS D1.3, AWS D1.4, AWS D1.8

Application Number: 02-122127	School Name: Louis Bohn Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-04-11 13:57:37

	Test or Special Inspection	Type	Performed By	Code References and Notes
	S/A8. SPRAYED FIRE-RESISTANT MATERIALS:			
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Examine structural steel surface conditions, inspect application, take samples, measure thickness and verify compliance of all aspects of application with DSA-approved documents.	Periodic	SI	1705A.15, 1705A.15.1, 1705A.15.2, 1705A.15.3, 1705A.15.4, 1705A.15.5, 1705A.15.6.
<input type="checkbox"/>	b. Test density.	Test	LOR	1705A.15.1, 1705A.15.5, ASTM E605
<input type="checkbox"/>	c. Bond strength adhesion/cohesion.	Test	LOR	1705A.15.1, 1705A.15.6, ASTM E736

	S/A9. ANCHOR BOLTS AND ANCHOR RODS:			
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Anchor Bolts and Anchor Rods	Test	LOR	Identify, sample and test anchor bolts and anchor rods not meeting exemptions identified in Section 1 of IR 17-11.
<input type="checkbox"/>	b. Threaded rod not used for foundation anchorage.	Test	LOR	Identify, sample and test threaded rods not meeting exemptions identified in Section 1 of IR 17-11.

	S/A10. STORAGE RACK SYSTEMS:			
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Materials used, to verify compliance with one or more of the material test reports in accordance with the approved construction documents.	Periodic	SI	Table 1705A.13.7
<input type="checkbox"/>	b. Fabricated storage rack elements.	Periodic	SI	1704A.2.5; Table 1705A.13.7

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (STEEL AND ALUMNINUM), 2022 CBC

1705A.2.1, Table 1705A.2.1; AISC 303-16, AISC 341-16, AISC 358-16, AISC 360-16; AISI S100-20; RCSC 2014; AWS D1.1, AWS D1.2, AWS D1.3, AWS D1.4, AWS D1.8

Application Number:

02-122127

School Name:

Louis Bohn Elementary School

School District:

Tracy Unified School District

DSA File Number:

39-73

Increment Number:

Date Created:

2024-04-11 13:57:37

	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	c. Storage rack anchorage installation.	Periodic	SI	ANSI/MH16.1 Section 7.3.2; Table 1705A.13.7
<input type="checkbox"/>	d. Completed storage rack system to indicate compliance with the approved construction documents.	Periodic	SI*	Table 1705A.13.7; * May be preformed by the project inspector when specifically approved by DSA.

	S/A11. Other Steel			
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input checked="" type="checkbox"/>	a. Shop welding-inspect welding of cold-formed steel periodic/special inspector	Periodic	SI	
<input checked="" type="checkbox"/>	b. Hollow bolts	Continuous	PI	Verify the torque installation torque

Appendix: Work Exempt from DSA Requirements for Structural Tests / Special Inspections

Application Number: 02-122127	School Name: Louis Bohn Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-04-11 13:57:37

Exempt items given in DSA IR A-22 or the 2022 CBC (including DSA amendments) and those items identified below with a check mark by the design professional are NOT subject to DSA requirements for the structural tests / special inspections noted. **Items marked as exempt shall be identified on the approved construction documents.** The project inspector shall verify all construction complies with the approved construction documents.

	SOILS:
<input type="checkbox"/>	1. Deep foundations acting as a cantilever footing with a design based on minimum allowable pressures per CBC Table 1806A.2 and without a geotechnical report for the following cases: A) free standing sign or scoreboard, B) cell or antenna towers and poles less than 35'-0" tall (e.g., lighting poles, flag poles, poles supporting open mesh fences, etc.), C) single-story structure with dead load less than 5 psf (e.g., open fabric shade structure), or D) covered walkway structure with an apex height less than 10'-0" above adjacent grade.
<input type="checkbox"/>	2. Shallow foundations, etc. are exempt from special inspections and testing by a Geotechnical Engineer for the following cases: A) buildings without a geotechnical report and meeting the exception item #1 criteria in CBC Section 1803A.2 supported by native soil (any excavation depth) or fill soil (not exceeding 12" depth per CBC Section 1804A.6), B) soil scarification/recompaction not exceeding 12" depth, C) native or fill soil supporting exterior non-structural flatwork (e.g., sidewalks, site concrete ramps, site stairs, parking lots, driveways, etc.), D) unpaved landscaping and playground areas, or E) utility trench backfill with depth not exceeding 12".

	CONCRETE/MASONRY:
<input checked="" type="checkbox"/>	1. Post-installed anchors for the following: A) exempt non-structural components (e.g., mechanical, electrical, plumbing equipment - see item 7 for "Welding" in the Appendix below) given in CBC Section 1617A.1.18 (which replaces ASCE 7-16, Section 13.1.4) or B) interior nonstructural wall partitions meeting criteria listed in exempt item 3 for "Welding" in the Appendix below
<input checked="" type="checkbox"/>	2. Concrete batch plant inspection is not required for items given in CBC Section 1705A.3.3.2 subject to the requirements and limitations in that section.
<input type="checkbox"/>	3. Non-bearing non-shear masonry walls may be exempt from certain DSA masonry testing and special inspection items as allowed per DSA IR 21-1. Refer to construction documents for specific exemptions accordingly for each applicable wall condition shown in Appendix A of IR 21-1.
<input checked="" type="checkbox"/>	4. Epoxy shear dowels in site flatwork and/or other non-structural concrete.

Appendix: Work Exempt from DSA Requirements for Structural Tests / Special Inspections

Application Number: 02-122127	School Name: Louis Bohn Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-04-11 13:57:37

	CONCRETE/MASONRY:
<input type="checkbox"/>	5. Testing of reinforcing bars is not required for items given in CBC Section 1910A.2 subject to the requirements and limitations in that section.

	WELDING:
<input type="checkbox"/>	1. Solid-clad and open-mesh fences, gates with maximum leaf span of 10', and gates with a maximum rolling section of 10' all having an apex height less than 8'-0" above lowest adjacent grade. When located above circulation or occupied space below, these gates/fences are not located within 1.5x gate/fence height (max 8'-0") to the edge of floor or roof.
<input type="checkbox"/>	2. Handrails, guardrails, and modular or relocatable ramps associated with walking surfaces less than 30" above adjacent grade (excluding post base connections per the 'Exception' language in Section 1705A.2.1); fillet welds shall not be ground flush.
<input type="checkbox"/>	3. Non-structural interior cold-formed steel framing spanning less than 15'-0", such as in interior partitions, interior soffits, etc. supporting only self weight and light-weight finishes or adhered tile, masonry, stone, or terra cotta veneer no more than 5/8" thickness and apex less than 20'-0" in height and not over an exit way. Maximum tributary load to a member shall not exceed the equivalent of that occurring from a 10'x10' opening in a 15' tall wall for a header or king stud.
<input type="checkbox"/>	4. Manufactured support frames and curbs using hot rolled or cold-formed steel (i.e., light gauge) for mechanical, electrical, or plumbing equipment weighing less than 2000# (equipment only) (connections of such frames to superstructure elements using welding will require special inspection as noted in selected item(s) for Sections S/A3, S/A4 and/or S/A5 of listing above).
<input type="checkbox"/>	5. Manufactured components (e.g., Tolco, B-Line, Afcon, etc.) for mechanical, electrical, or plumbing hanger support and bracing (connections of such components to superstructure elements using welding will require special inspection as noted in selected item(s) for Sections S/A3, S/A4 and/or S/A5 of listing above).
<input type="checkbox"/>	6. TV Brackets, projector mounts with a valid listing (see DSA IR A-5) and recreational equipment (e.g., playground structures, basketball backstops, etc.) (connections of such elements to superstructure elements using welding will require special inspection as noted in selected item(s) for sections S/A3, S/A4 and/or S/A5 located in the Steel/Aluminum category of listing above).

Appendix: Work Exempt from DSA Requirements for Structural Tests / Special Inspections

Application Number: 02-122127	School Name: Louis Bohn Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-04-11 13:57:37

	WELDING:
<input type="checkbox"/>	7. Any support for exempt non-structural components given in CBC Section 1617A.1.18 (which replaces ASCE 7-16, Section 13.1.4) meeting the following: A) when supported on a floor/roof, <400# and resulting composite center of mass (including component's center of mass) $\leq 4'$ above supporting floor/roof, B) when hung from a wall or roof/floor, <20# for discrete units or <5 plf for distributed systems.

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS(SIGNATURE), 2022 CBC

Application Number:

02-122127

School Name:

Louis Bohn Elementary School

School District:

Tracy Unified School District

DSA File Number:

39-73

Increment Number:

Date Created:

2024-04-11 13:57:37

Name of Architect or Engineer in general responsible charge:

Jeffrey Grau

Name of Structural Engineer (When structural design has been delegated):

Signature of Architect or Structural Engineer:

Date:

04/11/24

Note: To facilitate DSA electronic mark-ups and identification stamp application, DSA recommends against using secured electronic or digital signatures.

DSA STAMP

IDENTIFICATION STAMP
DIV. OF THE STATE ARCHITECT
APP: 02-122127 INC:
REVIEWED FOR
SS ☒ FLS ☒ ACS ☒
DATE: 04/12/2024

DSA 103-22: LIST OF REQUIRED VERIFIED REPORTS, CBC 2022

Application Number:

02-122127

DSA File Number:

39-73

School Name:

Louis Bohn Elementary School

Increment Number:

School District:

Tracy Unified School District

Date Created:

2024-04-11 13:57:37

1. Structural Testing and Inspection: Laboratory Verified Report Form DSA 291

2. Shop Welding Inspection: Laboratory Verified Report Form DSA 291, or, for independently contracting SI, Special Inspection Verified Report Form DSA 292

3. Field Welding Inspection: Laboratory Verified Report Form DSA 291, or, for independently contracting SI, Special Inspection Verified Report Form DSA 292

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS, 2022 CBC

General

Application Number: 02-122129	School Name: Jacobson Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-04-17 11:04:18

IMPORTANT: This form is only a summary list of structural tests and some of the special inspections required for the project. Generally, the structural tests and special inspections noted on this form are those that will be performed by the Geotechnical Engineer of Record, Laboratory of Record, or Special Inspector. The actual complete test and inspection program must be performed as detailed on the DSA approved documents. The appendix at the bottom of this form identifies work NOT subject to DSA requirements for special inspection or structural testing. The project inspector is responsible for providing inspection of all facets of construction, including but not limited to, special inspections not listed on this form such as structural wood framing, high-load wood diaphragms, cold-formed steel framing, anchorage of non-structural components, etc., per Title 24, Part 2, Chapter 17A (2022 CBC).

****NOTE:** Undefined section and table references found in this document are from the CBC, or California Building Code.

KEY TO COLUMNS

1. TYPE	2. PERFORMED BY
Continuous – Indicates that a continuous special inspection is required	GE (Geotechnical Engineer) – Indicates that the special inspection shall be performed by a registered geotechnical engineer or his or her authorized representative.
Periodic – Indicates that a periodic special inspection is required	LOR (Laboratory of Record) – Indicates that the test or special inspection shall be performed by a testing laboratory accepted in the DSA Laboratory Evaluation and Acceptance (LEA) Program. See CAC Section 4-335.
Test – Indicates that a test is required	PI (Project Inspector) – Indicates that the special inspection may be performed by a project inspector when specifically approved by DSA.
	SI (Special Inspection) – Indicates that the special inspection shall be performed by an appropriately qualified/approved special inspector.

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (SOILS), 2022 CBC

Table 1705A.6, Table 1705A.7, Table 1705A.8

Application Number: 02-122129	School Name: Jacobson Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-04-17 11:04:18

Geotechnical Reports: Project does NOT have and does NOT require a geotechnical report

S1. GENERAL:				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input checked="" type="checkbox"/>	a. Verify that: <ul style="list-style-type: none">• Site has been prepared properly prior to placement of controlled fill and/or excavations for foundations.• Foundation excavations are extended to proper depth and have reached proper material.• Materials below footings must not contain loose material, mud, organic silt, organic clays, or peat.	See Notes	PI	Refer to specific items identified in the Appendix listing exemptions for limitations. Placement of controlled fill exceeding 12" depth under foundations and/or within the building envelope is not permitted without a geotechnical report.

S2. SOIL COMPACTION AND FILL:				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input checked="" type="checkbox"/>	a. Perform classification and testing of fill materials.	Test	LOR*	* Under the supervision of the geotechnical engineer.
<input checked="" type="checkbox"/>	b. Verify use of proper materials, densities and inspect lift thicknesses, placement and compaction during placement of fill.	Continuous	LOR*	* Under the supervision of a geotechnical engineer or LOR's engineering manager. Refer to specific items identified in the Appendix listing exemptions for limitations.
<input checked="" type="checkbox"/>	c. Compaction testing.	Test	LOR*	* Under the supervision of a geotechnical engineer or LOR's engineering manager. Refer to specific items identified in the Appendix listing exemptions for limitations.

S3. DRIVEN DEEP FOUNDATIONS (PILES):				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Verify pile materials, sizes and lengths comply with the requirements.	Continuous	GE*	* By geotechnical engineer or his or her qualified representative.

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (SOILS), 2022 CBC

Table 1705A.6, Table 1705A.7, Table 1705A.8

Application Number: 02-122129	School Name: Jacobson Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-04-17 11:04:18

	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	b. Determine capacities of test piles and conduct additional load tests as required.	Test	LOR*	* Under the supervision of the geotechnical engineer.
<input type="checkbox"/>	c. Inspect driving operations and maintain complete and accurate records for each pile.	Continuous	GE*	* By geotechnical engineer or his or her qualified representative.
<input type="checkbox"/>	d. Verify locations of piles and their plumbness, confirm type and size of hammer, record number of blows per foot of penetration, determine required penetrations to achieve design capacity, record tip and butt elevations and record any pile damage.	Continuous	GE*	* By geotechnical engineer or his or her qualified representative.
<input type="checkbox"/>	e. Steel piles.	Provide tests and inspections per STEEL section below.		
<input type="checkbox"/>	f. Concrete piles and concrete filled piles.	Provide tests and inspections per CONCRETE section below.		
<input type="checkbox"/>	g. For specialty piles, perform additional inspections as determined by the registered design professional in responsible charge.	*	*	* As defined on drawings or specifications.

	S4. CAST-IN-PLACE DEEP FOUNDATIONS (PIERS):			
	Test or Special Inspection	Type	Performed By	Code References and Note
<input type="checkbox"/>	a. Inspect drilling operations and maintain complete and accurate records for each pier.	Continuous	PI	Continuous inspection to be provided by project inspector. Refer to specific items identified in the Appendix listing exemptions for limitations.
<input type="checkbox"/>	b. Verify pier locations, diameters, plumbness and lengths. Record concrete or grout volumes.	Continuous	PI	Continuous inspection to be provided by project inspector. Refer to specific items identified in the Appendix listing exemptions for limitations.
<input type="checkbox"/>	c. Concrete piers.	Provide tests and inspections per CONCRETE section below.		

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (SOILS), 2022 CBC

Table 1705A.6, Table 1705A.7, Table 1705A.8

Application Number: 02-122129	School Name: Jacobson Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-04-17 11:04:18

	Test or Special Inspection	Type	Performed By	Code References and Notes
	S5. RETAINING WALLS:			
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Placement, compaction and inspection of backfill.	Continuous	GE*	1705A.6.1. * By geotechnical engineer or his or her qualified representative. (See section S2 above).
<input type="checkbox"/>	b. Placement of soil reinforcement and/or drainage devices.	Continuous	GE*	* By geotechnical engineer or his or her qualified representative.
<input type="checkbox"/>	c. Segmental retaining walls; inspect placement of units, dowels, connectors, etc.	Continuous	GE*	* By geotechnical engineer or his or her qualified representative. See DSA IR 18-2.
<input type="checkbox"/>	d. Concrete retaining walls.	Provide tests and inspections per CONCRETE section below.		
<input type="checkbox"/>	e. Masonry retaining walls.	Provide tests and inspections per MASONRY section below.		

	S6. OTHER SOILS:			
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Soil Improvements	Test	GE*	Submit a comprehensive report documenting final soil improvements constructed, construction observation and the results of the confirmation testing and analysis to CGS (California Geological Survey) for final acceptance. * By geotechnical engineer or his or her qualified representative.
<input type="checkbox"/>	b. Inspection of Soil Improvements	Continuous	GE*	* By geotechnical engineer or his or her qualified representative.
<input type="checkbox"/>	c.			

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (CONCRETE), 2022 CBC

Table 1705A.3; ACI 318-19 Sections 26.12 & 26.13

Application Number: 02-122129	School Name: Jacobson Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-04-17 11:04:18

C1. CAST-IN-PLACE CONCRETE				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input checked="" type="checkbox"/>	a. Verify use of required design mix.	Continuous	SI	Table 1705A.3 Item 5, 1910A.1.
<input checked="" type="checkbox"/>	b. Identify, sample, and test reinforcing steel.	Test	LOR	1910A.2; ACI 318-19 Ch.20 and Section 26.6.1.2; DSA IR 17-10. (See Appendix (end of this form) for exemptions.)
<input checked="" type="checkbox"/>	c. During concrete placement, fabricate specimens for strength tests, perform slump and air content tests, and determine the temperature of the concrete.	Test	LOR	Table 1705A.3 Item 6; ACI 318-19 Sections 26.5 & 26.12.
<input checked="" type="checkbox"/>	d. Test concrete (f'c).	Test	LOR	1905A.1.17; ACI 318-19 Section 26.12.
<input checked="" type="checkbox"/>	e. Batch plant inspection:	See Notes	SI	Default of 'Continuous' per 1705A.3.3. If approved by DSA, batch plant inspection may be reduced to 'Periodic' subject to requirements in Section 1705A.3.3.1, or not required per 1705A.3.3.2. See IR 17-13. (See Appendix (end of this form) for exemptions.)
<input type="checkbox"/>	f. Welding of reinforcing steel.	Provide special inspection per STEEL, Category S/A4(d) & (e) and/or S/A5(g) & (h) below.		

C2. PRESTRESSED / POST-TENSIONED CONCRETE (IN ADDITION TO SECTION C1):				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Sample and test prestressing tendons and anchorages.	Test	LOR	1705A.3.4, 1910A.3
<input type="checkbox"/>	b. Inspect placement of prestressing tendons.	Periodic	SI	1705A.3.4, Table 1705A.3 Items 1 & 9.

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (CONCRETE), 2022 CBC

Table 1705A.3; ACI 318-19 Sections 26.12 & 26.13

Application Number: 02-122129	School Name: Jacobson Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-04-17 11:04:18

	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	c. Verify in-situ concrete strength prior to stressing of post-tensioning tendons.	Periodic	SI	Table 1705A.3 Item 13. Special inspector to verify specified concrete strength test prior to stressing.
<input type="checkbox"/>	d. Inspect application of post-tensioning or prestressing forces and grouting of bonded prestressing tendons.	Continuous	SI	1705A.3.4, Table 1705A.3 Item 9; ACI 318-19 Section 26.13

	C3. PRECAST CONCRETE (IN ADDITION TO SECTION C1):			
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Inspect fabrication of precast concrete members.	Continuous	SI	ACI 318-19 Section 26.13, and PCI MNL-128 and -130.
<input type="checkbox"/>	b. Inspect erection of precast concrete members.	Periodic	SI*	Table 1705A.3 Item 10. * May be performed by PI when specifically approved by DSA.
<input type="checkbox"/>	c. For precast concrete diaphragm connections or reinforcement at joints classified as moderate or high deformability elements (MDE or HDE) in structures assigned to Seismic Design Category D, E or F, inspect such connections and reinforcement in the field for: 1. Installation of the embedded parts 2. Completion of the continuity of reinforcement across joints. 3. Completion of connections in the field.	Continuous	SI	Table 1705A.3; ACI 318-19 Section 26.13.1.3; ACI 550.5
<input type="checkbox"/>	d. Inspect installation tolerances of precast concrete diaphragm connections for compliance with ACI 550.5.	Periodic	SI	Table 1705A.3; ACI 318-19 Section 26.13.1.3; ACI 550.5

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (CONCRETE), 2022 CBC

Table 1705A.3; ACI 318-19 Sections 26.12 & 26.13

Application Number: 02-122129	School Name: Jacobson Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-04-17 11:04:18

C4. SHOTCRETE (IN ADDITION TO SECTION C1):				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Inspect shotcrete placement for proper application techniques.	Continuous	SI	1705A.3.9, Table 1705A.3 Item 7, 1908A.1, 1908A.2, 1908A.3. See ACI 506.2-13 Section 3.4, ACI 506R-16.
<input type="checkbox"/>	b. Sample and test shotcrete (f'_c).	Test	LOR	1908A.2, 1705A.3.9

C5. POST-INSTALLED ANCHORS:				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Inspect installation of post-installed anchors	See Notes	SI*	1617A.1.19, Table 1705A.3 Item 4a (Continuous) & 4b (Periodic), 1705A.3.8 (See Appendix (end of this form) for exemptions). ACI 318-19 Section 26.13. * May be performed by the project inspector when specifically approved by DSA.
<input type="checkbox"/>	b. Test post-installed anchors.	Test	LOR	1910A.5. (See Appendix (end of this form) for exemptions.)

C6. OTHER CONCRETE:				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a.			

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (STEEL AND ALUMINUM), 2022 CBC

1705A.2.1, Table 1705A.2.1; AISC 303-16, AISC 341-16, AISC 358-16, AISC 360-16; AISI S100-20; RCSC 2014; AWS D1.1, AWS D1.2, AWS D1.3, AWS D1.4, AWS D1.8

Application Number: 02-122129	School Name: Jacobson Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-04-17 11:04:18

S/A1. STRUCTURAL STEEL, COLD-FORMED STEEL AND ALUMINUM USED FOR STRUCTURAL PURPOSES				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input checked="" type="checkbox"/>	a. Verify identification of all materials and: • Mill certificates indicate material properties that comply with requirements. • Material sizes, types and grades comply with requirements.	Periodic	*	Table 1705A.2.1 Item 3a 3c. 2202A.1; AISI S100-20 Section A3.1 & A3.2, AISI S240-20 Section A3 & A5, AISI S220-20 Sections A4 & A6. * By special inspector or qualified technician when performed off-site.
<input checked="" type="checkbox"/>	b. Test unidentified materials	Test	LOR	2202A.1.
<input checked="" type="checkbox"/>	c. Examine seam welds of HSS shapes	Periodic	SI	DSA IR 17-3.
<input checked="" type="checkbox"/>	d. Verify and document steel fabrication per DSA-approved construction documents.	Periodic	SI	Not applicable to cold-formed steel light-frame construction, except for trusses (1705A.2.4).
<input type="checkbox"/>	e. Buckling restrained braces.	Test	LOR	Testing and special inspections in accordance with IR 22-4.

S/A2. HIGH-STRENGTH BOLTS:				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Verify identification markings and manufacturer's certificates of compliance conform to ASTM standards specified in the DSA-approved documents.	Periodic	SI	Table 1705A.2.1 Items 1a & 1b, 2202A.1; AISC 360-16 Section A3.3, J3.1, and N3.2; RCSC 2014 Section 1.5 & 2.1; DSA IR 17-8 & DSA IR 17-9.
<input type="checkbox"/>	b. Test high-strength bolts, nuts and washers.	Test	LOR	Table 1705A.2.1 Item 1c, 2213A.1; RCSC 2014 Section 7.2; DSA IR 17-8.
<input type="checkbox"/>	c. Bearing-type ("snug tight") connections.	Periodic	SI	Table 1705A.2.1 Item 2a, 1705A.2.6, 2204A.2; AISC 360-16 J3.1, J3.2, M2.5 & N5.6; RCSC 2014 Section 9.1; DSA IR 17-9.
<input type="checkbox"/>	d. Pretensioned and slip-critical connections.	*	SI	Table 1705A.2.1 Items 2b & 2c, 1705A.2.6, 2204A.2; AISC 360-16 J3.1, J3.2, M2.5 & N5.6; RCSC 2014 Sections 9.2 & 9.3; DSA IR 17-9. **"Continuous" or "Periodic" depends on the tightening method used.

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (STEEL AND ALUMNINUM), 2022 CBC

1705A.2.1, Table 1705A.2.1; AISC 303-16, AISC 341-16, AISC 358-16, AISC 360-16; AISI S100-20; RCSC 2014; AWS D1.1, AWS D1.2, AWS D1.3, AWS D1.4, AWS D1.8

Application Number: 02-122129	School Name: Jacobson Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-04-17 11:04:18

S/A3. WELDING:				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input checked="" type="checkbox"/>	a. Verify weld filler material identification markings per AWS designation listed on the DSA-approved documents and the WPS.	Periodic	SI	1705A.2.5, Table 1705A.2.1 Items 4 & 5; AWS D1.1 and AWS D1.8 for structural steel; AWS D1.2 for Aluminum; AWS D1.3 for cold-formed steel; AWS D1.4 for reinforcing steel; DSA IR 17-3.
<input checked="" type="checkbox"/>	b. Verify weld filler material manufacturer's certificate of compliance.	Periodic	SI	DSA IR 17-3.
<input checked="" type="checkbox"/>	c. Verify WPS, welder qualifications and equipment.	Periodic	SI	DSA IR 17-3.

S/A4. SHOP WELDING (IN ADDITION TO SECTION S/A3):				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input checked="" type="checkbox"/>	a. Inspect groove welds, multi-pass fillet welds, single pass fillet welds > 5/16", plug and slot welds.	Continuous	SI	Table 1705A.2.1 Items 5a.1 4; AISC 360-16 (and AISC 341-16 as applicable); DSA IR 17-3.
<input checked="" type="checkbox"/>	b. Inspect single-pass fillet welds ≤ 5/16", floor and roof deck welds.	Periodic	SI	1705A.2.2, Table 1705A.2.1 Items 5a.5 & 5a.6; AISC 360-16 (and AISC 341-16 as applicable); DSA IR 17-3.
<input type="checkbox"/>	c. Inspect welding of stairs and railing systems.	Periodic	SI	1705A.2.1; AISC 360-16 (and AISC 341-16 as applicable); AWS D1.1 & D1.3; DSA IR 17-3.
<input type="checkbox"/>	d. Verification of reinforcing steel weldability other than ASTM A706.	Periodic	SI	1705A.3.1; AWS D1.4; DSA IR 17-3. Verify carbon equivalent reported on mill certificates.
<input type="checkbox"/>	e. Inspect welding of reinforcing steel.	Continuous	SI	Table 1705A.2.1 Item 5b, 1705A.3.1, Table 1705A.3 Item 2, 1903A.8; AWS D1.4; DSA IR 17-3.

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (STEEL AND ALUMNINUM), 2022 CBC

1705A.2.1, Table 1705A.2.1; AISC 303-16, AISC 341-16, AISC 358-16, AISC 360-16; AISI S100-20; RCSC 2014; AWS D1.1, AWS D1.2, AWS D1.3, AWS D1.4, AWS D1.8

Application Number: 02-122129	School Name: Jacobson Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-04-17 11:04:18

	Test or Special Inspection	Type	Performed By	Code References and Notes
	S/A5. FIELD WELDING (IN ADDITION TO SECTION S/A3):			
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Inspect groove welds, multi-pass fillet welds, single pass fillet welds > 5/16", plug and slot welds.	Continuous	SI	Table 1705A.2.1 Items 5a.1 4; AISC 360-16 (AISC 341-16 as applicable); DSA IR 17-3.
<input type="checkbox"/>	b. Inspect single-pass fillet welds ≤ 5/16".	Periodic	SI	Table 1705A.2.1 Item 5a.5; AISC 360-16 (AISC 341-16 as applicable); DSA IR 17-3.
<input type="checkbox"/>	c. Inspect end-welded studs (ASTM A-108) installation (including bend test).	Periodic	SI	2213A.2; AISC 360-16 (AISC 341-16 as applicable); AWS D1.1; DSA IR 17-3.
<input type="checkbox"/>	d. Inspect floor and roof deck welds.	Periodic	SI	1705A.2.2, Table 1705A.2.1 Item 5a.6; AISC 360-16 (AISC 341-16 as applicable); AWS D1.3; DSA IR 17-3.
<input type="checkbox"/>	e. Inspect welding of structural cold-formed steel.	Periodic	SI*	1705A.2.5; AWS D1.3; DSA IR 17-3. The quality control provisions of AISI S240-20 Chapter D shall also apply. * May be performed by the project inspector when specifically approved by DSA.
<input type="checkbox"/>	f. Inspect welding of stairs and railing systems.	Periodic	SI*	1705A.2.1; AISC 360-16 (AISC 341-16 as applicable); AWS D1.1 & D1.3; DSA IR 17-3. * May be performed by the project inspector when specifically approved by DSA.
<input type="checkbox"/>	g. Verification of reinforcing steel weldability.	Periodic	SI	1705A.3.1; AWS D1.4; DSA IR 17-3. Verify carbon equivalent reported on mill certificates.
<input type="checkbox"/>	h. Inspect welding of reinforcing steel.	Continuous	SI	Table 1705A.2.1 Item 5b, 1705A.3.1, Table 1705A.3 Item 2, 1903A.8; AWS D1.4; DSA IR 17-3.

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (STEEL AND ALUMNINUM), 2022 CBC

1705A.2.1, Table 1705A.2.1; AISC 303-16, AISC 341-16, AISC 358-16, AISC 360-16; AISI S100-20; RCSC 2014; AWS D1.1, AWS D1.2, AWS D1.3, AWS D1.4, AWS D1.8

Application Number:

02-122129

School Name:

Jacobson Elementary School

School District:

Tracy Unified School District

DSA File Number:

39-73

Increment Number:

Date Created:

2024-04-17 11:04:18

	Test or Special Inspection	Type	Performed By	Code References and Notes
	S/A6. NONDESTRUCTIVE TESTING:			
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Ultrasonic	Test	LOR	1705A.2.1, 1705A.2.5; AISC 341-16 J6.2, AISC 360-16 N5.5; AWS D1.1, AWS D1.8; DSA IR 17-2.
<input checked="" type="checkbox"/>	b. Magnetic Particle	Test	LOR	1705A.2.1, 1705A.2.5; AISC 341-16 J6.2, AISC 360-16 N5.5; AWS D1.1, AWS D1.8; DSA IR 17-2.
<input type="checkbox"/>	c.	Test	LOR	

	S/A7. STEEL JOISTS AND TRUSSES:			
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Verify size, type and grade for all chord and web members as well as connectors and weld filler material; verify joist profile, dimensions and camber (if applicable); verify all weld locations, lengths and profiles; mark or tag each joist.	Continuous	SI	1705A.2.3, Table 1705A.2.3; AWS D1.1; DSA IR 22-3 for steel joists only. 1705A.2.4; AWS D1.3 for cold-formed steel trusses.

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (STEEL AND ALUMNINUM), 2022 CBC

1705A.2.1, Table 1705A.2.1; AISC 303-16, AISC 341-16, AISC 358-16, AISC 360-16; AISI S100-20; RCSC 2014; AWS D1.1, AWS D1.2, AWS D1.3, AWS D1.4, AWS D1.8

Application Number: 02-122129	School Name: Jacobson Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-04-17 11:04:18

	Test or Special Inspection	Type	Performed By	Code References and Notes
	S/A8. SPRAYED FIRE-RESISTANT MATERIALS:			
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Examine structural steel surface conditions, inspect application, take samples, measure thickness and verify compliance of all aspects of application with DSA-approved documents.	Periodic	SI	1705A.15, 1705A.15.1, 1705A.15.2, 1705A.15.3, 1705A.15.4, 1705A.15.5, 1705A.15.6.
<input type="checkbox"/>	b. Test density.	Test	LOR	1705A.15.1, 1705A.15.5, ASTM E605
<input type="checkbox"/>	c. Bond strength adhesion/cohesion.	Test	LOR	1705A.15.1, 1705A.15.6, ASTM E736

	S/A9. ANCHOR BOLTS AND ANCHOR RODS:			
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Anchor Bolts and Anchor Rods	Test	LOR	Identify, sample and test anchor bolts and anchor rods not meeting exemptions identified in Section 1 of IR 17-11.
<input type="checkbox"/>	b. Threaded rod not used for foundation anchorage.	Test	LOR	Identify, sample and test threaded rods not meeting exemptions identified in Section 1 of IR 17-11.

	S/A10. STORAGE RACK SYSTEMS:			
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Materials used, to verify compliance with one or more of the material test reports in accordance with the approved construction documents.	Periodic	SI	Table 1705A.13.7
<input type="checkbox"/>	b. Fabricated storage rack elements.	Periodic	SI	1704A.2.5; Table 1705A.13.7

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (STEEL AND ALUMNINUM), 2022 CBC

1705A.2.1, Table 1705A.2.1; AISC 303-16, AISC 341-16, AISC 358-16, AISC 360-16; AISI S100-20; RCSC 2014; AWS D1.1, AWS D1.2, AWS D1.3, AWS D1.4, AWS D1.8

Application Number:

02-122129

School Name:

Jacobson Elementary School

School District:

Tracy Unified School District

DSA File Number:

39-73

Increment Number:

Date Created:

2024-04-17 11:04:18

	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	c. Storage rack anchorage installation.	Periodic	SI	ANSI/MH16.1 Section 7.3.2; Table 1705A.13.7
<input type="checkbox"/>	d. Completed storage rack system to indicate compliance with the approved construction documents.	Periodic	SI*	Table 1705A.13.7; * May be preformed by the project inspector when specifically approved by DSA.

	S/A11. Other Steel			
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input checked="" type="checkbox"/>	a. Shop Welding - inspect welding of cold-formed steel periodic/special inspector	Periodic	SI	
<input checked="" type="checkbox"/>	b. Hollow bolts	Continuous	PI	verify the torque installation torque

Appendix: Work Exempt from DSA Requirements for Structural Tests / Special Inspections

Application Number: 02-122129	School Name: Jacobson Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-04-17 11:04:18

Exempt items given in DSA IR A-22 or the 2022 CBC (including DSA amendments) and those items identified below with a check mark by the design professional are NOT subject to DSA requirements for the structural tests / special inspections noted. **Items marked as exempt shall be identified on the approved construction documents.** The project inspector shall verify all construction complies with the approved construction documents.

SOILS:	
<input type="checkbox"/>	1. Deep foundations acting as a cantilever footing with a design based on minimum allowable pressures per CBC Table 1806A.2 and without a geotechnical report for the following cases: A) free standing sign or scoreboard, B) cell or antenna towers and poles less than 35'-0" tall (e.g., lighting poles, flag poles, poles supporting open mesh fences, etc.), C) single-story structure with dead load less than 5 psf (e.g., open fabric shade structure), or D) covered walkway structure with an apex height less than 10'-0" above adjacent grade.
<input type="checkbox"/>	2. Shallow foundations, etc. are exempt from special inspections and testing by a Geotechnical Engineer for the following cases: A) buildings without a geotechnical report and meeting the exception item #1 criteria in CBC Section 1803A.2 supported by native soil (any excavation depth) or fill soil (not exceeding 12" depth per CBC Section 1804A.6), B) soil scarification/recompaction not exceeding 12" depth, C) native or fill soil supporting exterior non-structural flatwork (e.g., sidewalks, site concrete ramps, site stairs, parking lots, driveways, etc.), D) unpaved landscaping and playground areas, or E) utility trench backfill with depth not exceeding 12".

CONCRETE/MASONRY:	
<input type="checkbox"/>	1. Post-installed anchors for the following: A) exempt non-structural components (e.g., mechanical, electrical, plumbing equipment - see item 7 for "Welding" in the Appendix below) given in CBC Section 1617A.1.18 (which replaces ASCE 7-16, Section 13.1.4) or B) interior nonstructural wall partitions meeting criteria listed in exempt item 3 for "Welding" in the Appendix below
<input checked="" type="checkbox"/>	2. Concrete batch plant inspection is not required for items given in CBC Section 1705A.3.3.2 subject to the requirements and limitations in that section.
<input type="checkbox"/>	3. Non-bearing non-shear masonry walls may be exempt from certain DSA masonry testing and special inspection items as allowed per DSA IR 21-1. Refer to construction documents for specific exemptions accordingly for each applicable wall condition shown in Appendix A of IR 21-1.
<input checked="" type="checkbox"/>	4. Epoxy shear dowels in site flatwork and/or other non-structural concrete.

Appendix: Work Exempt from DSA Requirements for Structural Tests / Special Inspections

Application Number: 02-122129	School Name: Jacobson Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-04-17 11:04:18

	CONCRETE/MASONRY:
<input type="checkbox"/>	5. Testing of reinforcing bars is not required for items given in CBC Section 1910A.2 subject to the requirements and limitations in that section.

	WELDING:
<input type="checkbox"/>	1. Solid-clad and open-mesh fences, gates with maximum leaf span of 10', and gates with a maximum rolling section of 10' all having an apex height less than 8'-0" above lowest adjacent grade. When located above circulation or occupied space below, these gates/fences are not located within 1.5x gate/fence height (max 8'-0") to the edge of floor or roof.
<input type="checkbox"/>	2. Handrails, guardrails, and modular or relocatable ramps associated with walking surfaces less than 30" above adjacent grade (excluding post base connections per the 'Exception' language in Section 1705A.2.1); fillet welds shall not be ground flush.
<input type="checkbox"/>	3. Non-structural interior cold-formed steel framing spanning less than 15'-0", such as in interior partitions, interior soffits, etc. supporting only self weight and light-weight finishes or adhered tile, masonry, stone, or terra cotta veneer no more than 5/8" thickness and apex less than 20'-0" in height and not over an exit way. Maximum tributary load to a member shall not exceed the equivalent of that occurring from a 10'x10' opening in a 15' tall wall for a header or king stud.
<input type="checkbox"/>	4. Manufactured support frames and curbs using hot rolled or cold-formed steel (i.e., light gauge) for mechanical, electrical, or plumbing equipment weighing less than 2000# (equipment only) (connections of such frames to superstructure elements using welding will require special inspection as noted in selected item(s) for Sections S/A3, S/A4 and/or S/A5 of listing above).
<input type="checkbox"/>	5. Manufactured components (e.g., Tolco, B-Line, Afcon, etc.) for mechanical, electrical, or plumbing hanger support and bracing (connections of such components to superstructure elements using welding will require special inspection as noted in selected item(s) for Sections S/A3, S/A4 and/or S/A5 of listing above).
<input type="checkbox"/>	6. TV Brackets, projector mounts with a valid listing (see DSA IR A-5) and recreational equipment (e.g., playground structures, basketball backstops, etc.) (connections of such elements to superstructure elements using welding will require special inspection as noted in selected item(s) for sections S/A3, S/A4 and/or S/A5 located in the Steel/Aluminum category of listing above).

Appendix: Work Exempt from DSA Requirements for Structural Tests / Special Inspections

Application Number: 02-122129	School Name: Jacobson Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-04-17 11:04:18

	WELDING:
<input type="checkbox"/>	7. Any support for exempt non-structural components given in CBC Section 1617A.1.18 (which replaces ASCE 7-16, Section 13.1.4) meeting the following: A) when supported on a floor/roof, <400# and resulting composite center of mass (including component's center of mass) ≤4' above supporting floor/roof, B) when hung from a wall or roof/floor, <20# for discrete units or <5 plf for distributed systems.

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS(SIGNATURE), 2022 CBC

Application Number:

02-122129

School Name:

Jacobson Elementary School

School District:

Tracy Unified School District

DSA File Number:

39-73

Increment Number:

Date Created:

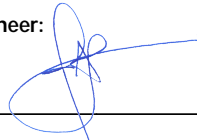
2024-04-17 11:04:18

Name of Architect or Engineer in general responsible charge:

Jeffrey Grau

Name of Structural Engineer (When structural design has been delegated):

Signature of Architect or Structural Engineer:



Date:

04/17/24

Note: To facilitate DSA electronic mark-ups and identification stamp application, DSA recommends against using secured electronic or digital signatures.

DSA STAMP

IDENTIFICATION STAMP
DIV. OF THE STATE ARCHITECT
APP: 02-122129 INC:
REVIEWED FOR
SS ☒ FLS ☒ ACS ☒
DATE: 04/17/2024

DSA 103-22: LIST OF REQUIRED VERIFIED REPORTS, CBC 2022

Application Number:

02-122129

DSA File Number:

39-73

School Name:

Jacobson Elementary School

Increment Number:

School District:

Tracy Unified School District

Date Created:

2024-04-17 11:04:18

1. Structural Testing and Inspection: Laboratory Verified Report Form DSA 291

2. Shop Welding Inspection: Laboratory Verified Report Form DSA 291, or, for independently contracting SI, Special Inspection Verified Report Form DSA 292

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS, 2022 CBC

General

Application Number: 02-122130	School Name: Gladys Poet Christian Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-04-17 11:05:22

IMPORTANT: This form is only a summary list of structural tests and some of the special inspections required for the project. Generally, the structural tests and special inspections noted on this form are those that will be performed by the Geotechnical Engineer of Record, Laboratory of Record, or Special Inspector. The actual complete test and inspection program must be performed as detailed on the DSA approved documents. The appendix at the bottom of this form identifies work NOT subject to DSA requirements for special inspection or structural testing. The project inspector is responsible for providing inspection of all facets of construction, including but not limited to, special inspections not listed on this form such as structural wood framing, high-load wood diaphragms, cold-formed steel framing, anchorage of non-structural components, etc., per Title 24, Part 2, Chapter 17A (2022 CBC).

****NOTE:** Undefined section and table references found in this document are from the CBC, or California Building Code.

KEY TO COLUMNS

1. TYPE	2. PERFORMED BY
Continuous – Indicates that a continuous special inspection is required	GE (Geotechnical Engineer) – Indicates that the special inspection shall be performed by a registered geotechnical engineer or his or her authorized representative.
Periodic – Indicates that a periodic special inspection is required	LOR (Laboratory of Record) – Indicates that the test or special inspection shall be performed by a testing laboratory accepted in the DSA Laboratory Evaluation and Acceptance (LEA) Program. See CAC Section 4-335.
Test – Indicates that a test is required	PI (Project Inspector) – Indicates that the special inspection may be performed by a project inspector when specifically approved by DSA.
	SI (Special Inspection) – Indicates that the special inspection shall be performed by an appropriately qualified/approved special inspector.

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (SOILS), 2022 CBC

Table 1705A.6, Table 1705A.7, Table 1705A.8

Application Number: 02-122130	School Name: Gladys Poet Christian Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-04-17 11:05:22

Geotechnical Reports: Project does NOT have and does NOT require a geotechnical report

S1. GENERAL:				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input checked="" type="checkbox"/>	a. Verify that: <ul style="list-style-type: none">• Site has been prepared properly prior to placement of controlled fill and/or excavations for foundations.• Foundation excavations are extended to proper depth and have reached proper material.• Materials below footings must not contain loose material, mud, organic silt, organic clays, or peat.	See Notes	PI	Refer to specific items identified in the Appendix listing exemptions for limitations. Placement of controlled fill exceeding 12" depth under foundations and/or within the building envelope is not permitted without a geotechnical report.

S2. SOIL COMPACTION AND FILL:				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input checked="" type="checkbox"/>	a. Perform classification and testing of fill materials.	Test	LOR*	* Under the supervision of the geotechnical engineer.
<input checked="" type="checkbox"/>	b. Verify use of proper materials, densities and inspect lift thicknesses, placement and compaction during placement of fill.	Continuous	LOR*	* Under the supervision of a geotechnical engineer or LOR's engineering manager. Refer to specific items identified in the Appendix listing exemptions for limitations.
<input checked="" type="checkbox"/>	c. Compaction testing.	Test	LOR*	* Under the supervision of a geotechnical engineer or LOR's engineering manager. Refer to specific items identified in the Appendix listing exemptions for limitations.

S3. DRIVEN DEEP FOUNDATIONS (PILES):				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Verify pile materials, sizes and lengths comply with the requirements.	Continuous	GE*	* By geotechnical engineer or his or her qualified representative.

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (SOILS), 2022 CBC

Table 1705A.6, Table 1705A.7, Table 1705A.8

Application Number: 02-122130	School Name: Gladys Poet Christian Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-04-17 11:05:22

	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	b. Determine capacities of test piles and conduct additional load tests as required.	Test	LOR*	* Under the supervision of the geotechnical engineer.
<input type="checkbox"/>	c. Inspect driving operations and maintain complete and accurate records for each pile.	Continuous	GE*	* By geotechnical engineer or his or her qualified representative.
<input type="checkbox"/>	d. Verify locations of piles and their plumbness, confirm type and size of hammer, record number of blows per foot of penetration, determine required penetrations to achieve design capacity, record tip and butt elevations and record any pile damage.	Continuous	GE*	* By geotechnical engineer or his or her qualified representative.
<input type="checkbox"/>	e. Steel piles.	Provide tests and inspections per STEEL section below.		
<input type="checkbox"/>	f. Concrete piles and concrete filled piles.	Provide tests and inspections per CONCRETE section below.		
<input type="checkbox"/>	g. For specialty piles, perform additional inspections as determined by the registered design professional in responsible charge.	*	*	* As defined on drawings or specifications.

	S4. CAST-IN-PLACE DEEP FOUNDATIONS (PIERS):			
	Test or Special Inspection	Type	Performed By	Code References and Note
<input type="checkbox"/>	a. Inspect drilling operations and maintain complete and accurate records for each pier.	Continuous	PI	Continuous inspection to be provided by project inspector. Refer to specific items identified in the Appendix listing exemptions for limitations.
<input type="checkbox"/>	b. Verify pier locations, diameters, plumbness and lengths. Record concrete or grout volumes.	Continuous	PI	Continuous inspection to be provided by project inspector. Refer to specific items identified in the Appendix listing exemptions for limitations.
<input type="checkbox"/>	c. Concrete piers.	Provide tests and inspections per CONCRETE section below.		

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (SOILS), 2022 CBC

Table 1705A.6, Table 1705A.7, Table 1705A.8

Application Number: 02-122130	School Name: Gladys Poet Christian Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-04-17 11:05:22

	Test or Special Inspection	Type	Performed By	Code References and Notes
	S5. RETAINING WALLS:			
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Placement, compaction and inspection of backfill.	Continuous	GE*	1705A.6.1. * By geotechnical engineer or his or her qualified representative. (See section S2 above).
<input type="checkbox"/>	b. Placement of soil reinforcement and/or drainage devices.	Continuous	GE*	* By geotechnical engineer or his or her qualified representative.
<input type="checkbox"/>	c. Segmental retaining walls; inspect placement of units, dowels, connectors, etc.	Continuous	GE*	* By geotechnical engineer or his or her qualified representative. See DSA IR 18-2.
<input type="checkbox"/>	d. Concrete retaining walls.	Provide tests and inspections per CONCRETE section below.		
<input type="checkbox"/>	e. Masonry retaining walls.	Provide tests and inspections per MASONRY section below.		

	S6. OTHER SOILS:			
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Soil Improvements	Test	GE*	Submit a comprehensive report documenting final soil improvements constructed, construction observation and the results of the confirmation testing and analysis to CGS (California Geological Survey) for final acceptance. * By geotechnical engineer or his or her qualified representative.
<input type="checkbox"/>	b. Inspection of Soil Improvements	Continuous	GE*	* By geotechnical engineer or his or her qualified representative.
<input type="checkbox"/>	c.			

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (CONCRETE), 2022 CBC

Table 1705A.3; ACI 318-19 Sections 26.12 & 26.13

Application Number: 02-122130	School Name: Gladys Poet Christian Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-04-17 11:05:22

C1. CAST-IN-PLACE CONCRETE				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input checked="" type="checkbox"/>	a. Verify use of required design mix.	Continuous	SI	Table 1705A.3 Item 5, 1910A.1.
<input checked="" type="checkbox"/>	b. Identify, sample, and test reinforcing steel.	Test	LOR	1910A.2; ACI 318-19 Ch.20 and Section 26.6.1.2; DSA IR 17-10. (See Appendix (end of this form) for exemptions.)
<input checked="" type="checkbox"/>	c. During concrete placement, fabricate specimens for strength tests, perform slump and air content tests, and determine the temperature of the concrete.	Test	LOR	Table 1705A.3 Item 6; ACI 318-19 Sections 26.5 & 26.12.
<input checked="" type="checkbox"/>	d. Test concrete (f'c).	Test	LOR	1905A.1.17; ACI 318-19 Section 26.12.
<input checked="" type="checkbox"/>	e. Batch plant inspection:	See Notes	SI	Default of 'Continuous' per 1705A.3.3. If approved by DSA, batch plant inspection may be reduced to 'Periodic' subject to requirements in Section 1705A.3.3.1, or not required per 1705A.3.3.2. See IR 17-13. (See Appendix (end of this form) for exemptions.)
<input type="checkbox"/>	f. Welding of reinforcing steel.	Provide special inspection per STEEL, Category S/A4(d) & (e) and/or S/A5(g) & (h) below.		

C2. PRESTRESSED / POST-TENSIONED CONCRETE (IN ADDITION TO SECTION C1):				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Sample and test prestressing tendons and anchorages.	Test	LOR	1705A.3.4, 1910A.3
<input type="checkbox"/>	b. Inspect placement of prestressing tendons.	Periodic	SI	1705A.3.4, Table 1705A.3 Items 1 & 9.

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (CONCRETE), 2022 CBC

Table 1705A.3; ACI 318-19 Sections 26.12 & 26.13

Application Number: 02-122130	School Name: Gladys Poet Christian Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-04-17 11:05:22

	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	c. Verify in-situ concrete strength prior to stressing of post-tensioning tendons.	Periodic	SI	Table 1705A.3 Item 13. Special inspector to verify specified concrete strength test prior to stressing.
<input type="checkbox"/>	d. Inspect application of post-tensioning or prestressing forces and grouting of bonded prestressing tendons.	Continuous	SI	1705A.3.4, Table 1705A.3 Item 9; ACI 318-19 Section 26.13

	C3. PRECAST CONCRETE (IN ADDITION TO SECTION C1):			
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Inspect fabrication of precast concrete members.	Continuous	SI	ACI 318-19 Section 26.13, and PCI MNL-128 and -130.
<input type="checkbox"/>	b. Inspect erection of precast concrete members.	Periodic	SI*	Table 1705A.3 Item 10. * May be performed by PI when specifically approved by DSA.
<input type="checkbox"/>	c. For precast concrete diaphragm connections or reinforcement at joints classified as moderate or high deformability elements (MDE or HDE) in structures assigned to Seismic Design Category D, E or F, inspect such connections and reinforcement in the field for: 1. Installation of the embedded parts 2. Completion of the continuity of reinforcement across joints. 3. Completion of connections in the field.	Continuous	SI	Table 1705A.3; ACI 318-19 Section 26.13.1.3; ACI 550.5
<input type="checkbox"/>	d. Inspect installation tolerances of precast concrete diaphragm connections for compliance with ACI 550.5.	Periodic	SI	Table 1705A.3; ACI 318-19 Section 26.13.1.3; ACI 550.5

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (CONCRETE), 2022 CBC

Table 1705A.3; ACI 318-19 Sections 26.12 & 26.13

Application Number: 02-122130	School Name: Gladys Poet Christian Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-04-17 11:05:22

C4. SHOTCRETE (IN ADDITION TO SECTION C1):				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Inspect shotcrete placement for proper application techniques.	Continuous	SI	1705A.3.9, Table 1705A.3 Item 7, 1908A.1, 1908A.2, 1908A.3. See ACI 506.2-13 Section 3.4, ACI 506R-16.
<input type="checkbox"/>	b. Sample and test shotcrete (f'_c).	Test	LOR	1908A.2, 1705A.3.9

C5. POST-INSTALLED ANCHORS:				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Inspect installation of post-installed anchors	See Notes	SI*	1617A.1.19, Table 1705A.3 Item 4a (Continuous) & 4b (Periodic), 1705A.3.8 (See Appendix (end of this form) for exemptions). ACI 318-19 Section 26.13. * May be performed by the project inspector when specifically approved by DSA.
<input type="checkbox"/>	b. Test post-installed anchors.	Test	LOR	1910A.5. (See Appendix (end of this form) for exemptions.)

C6. OTHER CONCRETE:				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a.			

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (STEEL AND ALUMINUM), 2022 CBC

1705A.2.1, Table 1705A.2.1; AISC 303-16, AISC 341-16, AISC 358-16, AISC 360-16; AISI S100-20; RCSC 2014; AWS D1.1, AWS D1.2, AWS D1.3, AWS D1.4, AWS D1.8

Application Number: 02-122130	School Name: Gladys Poet Christian Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-04-17 11:05:22

S/A1. STRUCTURAL STEEL, COLD-FORMED STEEL AND ALUMINUM USED FOR STRUCTURAL PURPOSES				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input checked="" type="checkbox"/>	a. Verify identification of all materials and: • Mill certificates indicate material properties that comply with requirements. • Material sizes, types and grades comply with requirements.	Periodic	*	Table 1705A.2.1 Item 3a 3c. 2202A.1; AISI S100-20 Section A3.1 & A3.2, AISI S240-20 Section A3 & A5, AISI S220-20 Sections A4 & A6. * By special inspector or qualified technician when performed off-site.
<input checked="" type="checkbox"/>	b. Test unidentified materials	Test	LOR	2202A.1.
<input checked="" type="checkbox"/>	c. Examine seam welds of HSS shapes	Periodic	SI	DSA IR 17-3.
<input checked="" type="checkbox"/>	d. Verify and document steel fabrication per DSA-approved construction documents.	Periodic	SI	Not applicable to cold-formed steel light-frame construction, except for trusses (1705A.2.4).
<input type="checkbox"/>	e. Buckling restrained braces.	Test	LOR	Testing and special inspections in accordance with IR 22-4.

S/A2. HIGH-STRENGTH BOLTS:				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Verify identification markings and manufacturer's certificates of compliance conform to ASTM standards specified in the DSA-approved documents.	Periodic	SI	Table 1705A.2.1 Items 1a & 1b, 2202A.1; AISC 360-16 Section A3.3, J3.1, and N3.2; RCSC 2014 Section 1.5 & 2.1; DSA IR 17-8 & DSA IR 17-9.
<input type="checkbox"/>	b. Test high-strength bolts, nuts and washers.	Test	LOR	Table 1705A.2.1 Item 1c, 2213A.1; RCSC 2014 Section 7.2; DSA IR 17-8.
<input type="checkbox"/>	c. Bearing-type ("snug tight") connections.	Periodic	SI	Table 1705A.2.1 Item 2a, 1705A.2.6, 2204A.2; AISC 360-16 J3.1, J3.2, M2.5 & N5.6; RCSC 2014 Section 9.1; DSA IR 17-9.
<input type="checkbox"/>	d. Pretensioned and slip-critical connections.	*	SI	Table 1705A.2.1 Items 2b & 2c, 1705A.2.6, 2204A.2; AISC 360-16 J3.1, J3.2, M2.5 & N5.6; RCSC 2014 Sections 9.2 & 9.3; DSA IR 17-9. **"Continuous" or "Periodic" depends on the tightening method used.

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (STEEL AND ALUMNINUM), 2022 CBC

1705A.2.1, Table 1705A.2.1; AISC 303-16, AISC 341-16, AISC 358-16, AISC 360-16; AISI S100-20; RCSC 2014; AWS D1.1, AWS D1.2, AWS D1.3, AWS D1.4, AWS D1.8

Application Number: 02-122130	School Name: Gladys Poet Christian Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-04-17 11:05:22

S/A3. WELDING:				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input checked="" type="checkbox"/>	a. Verify weld filler material identification markings per AWS designation listed on the DSA-approved documents and the WPS.	Periodic	SI	1705A.2.5, Table 1705A.2.1 Items 4 & 5; AWS D1.1 and AWS D1.8 for structural steel; AWS D1.2 for Aluminum; AWS D1.3 for cold-formed steel; AWS D1.4 for reinforcing steel; DSA IR 17-3.
<input checked="" type="checkbox"/>	b. Verify weld filler material manufacturer's certificate of compliance.	Periodic	SI	DSA IR 17-3.
<input checked="" type="checkbox"/>	c. Verify WPS, welder qualifications and equipment.	Periodic	SI	DSA IR 17-3.

S/A4. SHOP WELDING (IN ADDITION TO SECTION S/A3):				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input checked="" type="checkbox"/>	a. Inspect groove welds, multi-pass fillet welds, single pass fillet welds > 5/16", plug and slot welds.	Continuous	SI	Table 1705A.2.1 Items 5a.1 4; AISC 360-16 (and AISC 341-16 as applicable); DSA IR 17-3.
<input checked="" type="checkbox"/>	b. Inspect single-pass fillet welds ≤ 5/16", floor and roof deck welds.	Periodic	SI	1705A.2.2, Table 1705A.2.1 Items 5a.5 & 5a.6; AISC 360-16 (and AISC 341-16 as applicable); DSA IR 17-3.
<input type="checkbox"/>	c. Inspect welding of stairs and railing systems.	Periodic	SI	1705A.2.1; AISC 360-16 (and AISC 341-16 as applicable); AWS D1.1 & D1.3; DSA IR 17-3.
<input type="checkbox"/>	d. Verification of reinforcing steel weldability other than ASTM A706.	Periodic	SI	1705A.3.1; AWS D1.4; DSA IR 17-3. Verify carbon equivalent reported on mill certificates.
<input type="checkbox"/>	e. Inspect welding of reinforcing steel.	Continuous	SI	Table 1705A.2.1 Item 5b, 1705A.3.1, Table 1705A.3 Item 2, 1903A.8; AWS D1.4; DSA IR 17-3.

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (STEEL AND ALUMNINUM), 2022 CBC

1705A.2.1, Table 1705A.2.1; AISC 303-16, AISC 341-16, AISC 358-16, AISC 360-16; AISI S100-20; RCSC 2014; AWS D1.1, AWS D1.2, AWS D1.3, AWS D1.4, AWS D1.8

Application Number: 02-122130	School Name: Gladys Poet Christian Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-04-17 11:05:22

	Test or Special Inspection	Type	Performed By	Code References and Notes
	S/A5. FIELD WELDING (IN ADDITION TO SECTION S/A3):			
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Inspect groove welds, multi-pass fillet welds, single pass fillet welds > 5/16", plug and slot welds.	Continuous	SI	Table 1705A.2.1 Items 5a.1 4; AISC 360-16 (AISC 341-16 as applicable); DSA IR 17-3.
<input type="checkbox"/>	b. Inspect single-pass fillet welds ≤ 5/16".	Periodic	SI	Table 1705A.2.1 Item 5a.5; AISC 360-16 (AISC 341-16 as applicable); DSA IR 17-3.
<input type="checkbox"/>	c. Inspect end-welded studs (ASTM A-108) installation (including bend test).	Periodic	SI	2213A.2; AISC 360-16 (AISC 341-16 as applicable); AWS D1.1; DSA IR 17-3.
<input type="checkbox"/>	d. Inspect floor and roof deck welds.	Periodic	SI	1705A.2.2, Table 1705A.2.1 Item 5a.6; AISC 360-16 (AISC 341-16 as applicable); AWS D1.3; DSA IR 17-3.
<input type="checkbox"/>	e. Inspect welding of structural cold-formed steel.	Periodic	SI*	1705A.2.5; AWS D1.3; DSA IR 17-3. The quality control provisions of AISI S240-20 Chapter D shall also apply. * May be performed by the project inspector when specifically approved by DSA.
<input type="checkbox"/>	f. Inspect welding of stairs and railing systems.	Periodic	SI*	1705A.2.1; AISC 360-16 (AISC 341-16 as applicable); AWS D1.1 & D1.3; DSA IR 17-3. * May be performed by the project inspector when specifically approved by DSA.
<input type="checkbox"/>	g. Verification of reinforcing steel weldability.	Periodic	SI	1705A.3.1; AWS D1.4; DSA IR 17-3. Verify carbon equivalent reported on mill certificates.
<input type="checkbox"/>	h. Inspect welding of reinforcing steel.	Continuous	SI	Table 1705A.2.1 Item 5b, 1705A.3.1, Table 1705A.3 Item 2, 1903A.8; AWS D1.4; DSA IR 17-3.

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (STEEL AND ALUMNINUM), 2022 CBC

1705A.2.1, Table 1705A.2.1; AISC 303-16, AISC 341-16, AISC 358-16, AISC 360-16; AISI S100-20; RCSC 2014; AWS D1.1, AWS D1.2, AWS D1.3, AWS D1.4, AWS D1.8

Application Number:

02-122130

School Name:

Gladys Poet Christian Elementary School

School District:

Tracy Unified School District

DSA File Number:

39-73

Increment Number:

Date Created:

2024-04-17 11:05:22

	Test or Special Inspection	Type	Performed By	Code References and Notes
	S/A6. NONDESTRUCTIVE TESTING:			
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Ultrasonic	Test	LOR	1705A.2.1, 1705A.2.5; AISC 341-16 J6.2, AISC 360-16 N5.5; AWS D1.1, AWS D1.8; DSA IR 17-2.
<input checked="" type="checkbox"/>	b. Magnetic Particle	Test	LOR	1705A.2.1, 1705A.2.5; AISC 341-16 J6.2, AISC 360-16 N5.5; AWS D1.1, AWS D1.8; DSA IR 17-2.
<input type="checkbox"/>	c.	Test	LOR	

	S/A7. STEEL JOISTS AND TRUSSES:			
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Verify size, type and grade for all chord and web members as well as connectors and weld filler material; verify joist profile, dimensions and camber (if applicable); verify all weld locations, lengths and profiles; mark or tag each joist.	Continuous	SI	1705A.2.3, Table 1705A.2.3; AWS D1.1; DSA IR 22-3 for steel joists only. 1705A.2.4; AWS D1.3 for cold-formed steel trusses.

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (STEEL AND ALUMNINUM), 2022 CBC

1705A.2.1, Table 1705A.2.1; AISC 303-16, AISC 341-16, AISC 358-16, AISC 360-16; AISI S100-20; RCSC 2014; AWS D1.1, AWS D1.2, AWS D1.3, AWS D1.4, AWS D1.8

Application Number: 02-122130	School Name: Gladys Poet Christian Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-04-17 11:05:22

	Test or Special Inspection	Type	Performed By	Code References and Notes
	S/A8. SPRAYED FIRE-RESISTANT MATERIALS:			
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Examine structural steel surface conditions, inspect application, take samples, measure thickness and verify compliance of all aspects of application with DSA-approved documents.	Periodic	SI	1705A.15, 1705A.15.1, 1705A.15.2, 1705A.15.3, 1705A.15.4, 1705A.15.5, 1705A.15.6.
<input type="checkbox"/>	b. Test density.	Test	LOR	1705A.15.1, 1705A.15.5, ASTM E605
<input type="checkbox"/>	c. Bond strength adhesion/cohesion.	Test	LOR	1705A.15.1, 1705A.15.6, ASTM E736

	S/A9. ANCHOR BOLTS AND ANCHOR RODS:			
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Anchor Bolts and Anchor Rods	Test	LOR	Identify, sample and test anchor bolts and anchor rods not meeting exemptions identified in Section 1 of IR 17-11.
<input type="checkbox"/>	b. Threaded rod not used for foundation anchorage.	Test	LOR	Identify, sample and test threaded rods not meeting exemptions identified in Section 1 of IR 17-11.

	S/A10. STORAGE RACK SYSTEMS:			
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Materials used, to verify compliance with one or more of the material test reports in accordance with the approved construction documents.	Periodic	SI	Table 1705A.13.7
<input type="checkbox"/>	b. Fabricated storage rack elements.	Periodic	SI	1704A.2.5; Table 1705A.13.7

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (STEEL AND ALUMNINUM), 2022 CBC

1705A.2.1, Table 1705A.2.1; AISC 303-16, AISC 341-16, AISC 358-16, AISC 360-16; AISI S100-20; RCSC 2014; AWS D1.1, AWS D1.2, AWS D1.3, AWS D1.4, AWS D1.8

Application Number:

02-122130

School Name:

Gladys Poet Christian Elementary School

School District:

Tracy Unified School District

DSA File Number:

39-73

Increment Number:

Date Created:

2024-04-17 11:05:22

	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	c. Storage rack anchorage installation.	Periodic	SI	ANSI/MH16.1 Section 7.3.2; Table 1705A.13.7
<input type="checkbox"/>	d. Completed storage rack system to indicate compliance with the approved construction documents.	Periodic	SI*	Table 1705A.13.7; * May be preformed by the project inspector when specifically approved by DSA.

	S/A11. Other Steel			
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input checked="" type="checkbox"/>	a. Shop welding-inspect welding of cold-formed steel periodic /special inspector	Periodic	SI	
<input checked="" type="checkbox"/>	b. Hollow bolts	Continuous	PI	Verify the torque installation torque

Appendix: Work Exempt from DSA Requirements for Structural Tests / Special Inspections

Application Number: 02-122130	School Name: Gladys Poet Christian Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-04-17 11:05:22

Exempt items given in DSA IR A-22 or the 2022 CBC (including DSA amendments) and those items identified below with a check mark by the design professional are NOT subject to DSA requirements for the structural tests / special inspections noted. **Items marked as exempt shall be identified on the approved construction documents.** The project inspector shall verify all construction complies with the approved construction documents.

	SOILS:
<input type="checkbox"/>	1. Deep foundations acting as a cantilever footing with a design based on minimum allowable pressures per CBC Table 1806A.2 and without a geotechnical report for the following cases: A) free standing sign or scoreboard, B) cell or antenna towers and poles less than 35'-0" tall (e.g., lighting poles, flag poles, poles supporting open mesh fences, etc.), C) single-story structure with dead load less than 5 psf (e.g., open fabric shade structure), or D) covered walkway structure with an apex height less than 10'-0" above adjacent grade.
<input type="checkbox"/>	2. Shallow foundations, etc. are exempt from special inspections and testing by a Geotechnical Engineer for the following cases: A) buildings without a geotechnical report and meeting the exception item #1 criteria in CBC Section 1803A.2 supported by native soil (any excavation depth) or fill soil (not exceeding 12" depth per CBC Section 1804A.6), B) soil scarification/recompaction not exceeding 12" depth, C) native or fill soil supporting exterior non-structural flatwork (e.g., sidewalks, site concrete ramps, site stairs, parking lots, driveways, etc.), D) unpaved landscaping and playground areas, or E) utility trench backfill with depth not exceeding 12".

	CONCRETE/MASONRY:
<input type="checkbox"/>	1. Post-installed anchors for the following: A) exempt non-structural components (e.g., mechanical, electrical, plumbing equipment - see item 7 for "Welding" in the Appendix below) given in CBC Section 1617A.1.18 (which replaces ASCE 7-16, Section 13.1.4) or B) interior nonstructural wall partitions meeting criteria listed in exempt item 3 for "Welding" in the Appendix below
<input checked="" type="checkbox"/>	2. Concrete batch plant inspection is not required for items given in CBC Section 1705A.3.3.2 subject to the requirements and limitations in that section.
<input type="checkbox"/>	3. Non-bearing non-shear masonry walls may be exempt from certain DSA masonry testing and special inspection items as allowed per DSA IR 21-1. Refer to construction documents for specific exemptions accordingly for each applicable wall condition shown in Appendix A of IR 21-1.
<input checked="" type="checkbox"/>	4. Epoxy shear dowels in site flatwork and/or other non-structural concrete.

Appendix: Work Exempt from DSA Requirements for Structural Tests / Special Inspections

Application Number: 02-122130	School Name: Gladys Poet Christian Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-04-17 11:05:22

	CONCRETE/MASONRY:
<input type="checkbox"/>	5. Testing of reinforcing bars is not required for items given in CBC Section 1910A.2 subject to the requirements and limitations in that section.

	WELDING:
<input type="checkbox"/>	1. Solid-clad and open-mesh fences, gates with maximum leaf span of 10', and gates with a maximum rolling section of 10' all having an apex height less than 8'-0" above lowest adjacent grade. When located above circulation or occupied space below, these gates/fences are not located within 1.5x gate/fence height (max 8'-0") to the edge of floor or roof.
<input type="checkbox"/>	2. Handrails, guardrails, and modular or relocatable ramps associated with walking surfaces less than 30" above adjacent grade (excluding post base connections per the 'Exception' language in Section 1705A.2.1); fillet welds shall not be ground flush.
<input type="checkbox"/>	3. Non-structural interior cold-formed steel framing spanning less than 15'-0", such as in interior partitions, interior soffits, etc. supporting only self weight and light-weight finishes or adhered tile, masonry, stone, or terra cotta veneer no more than 5/8" thickness and apex less than 20'-0" in height and not over an exit way. Maximum tributary load to a member shall not exceed the equivalent of that occurring from a 10'x10' opening in a 15' tall wall for a header or king stud.
<input type="checkbox"/>	4. Manufactured support frames and curbs using hot rolled or cold-formed steel (i.e., light gauge) for mechanical, electrical, or plumbing equipment weighing less than 2000# (equipment only) (connections of such frames to superstructure elements using welding will require special inspection as noted in selected item(s) for Sections S/A3, S/A4 and/or S/A5 of listing above).
<input type="checkbox"/>	5. Manufactured components (e.g., Tolco, B-Line, Afcon, etc.) for mechanical, electrical, or plumbing hanger support and bracing (connections of such components to superstructure elements using welding will require special inspection as noted in selected item(s) for Sections S/A3, S/A4 and/or S/A5 of listing above).
<input type="checkbox"/>	6. TV Brackets, projector mounts with a valid listing (see DSA IR A-5) and recreational equipment (e.g., playground structures, basketball backstops, etc.) (connections of such elements to superstructure elements using welding will require special inspection as noted in selected item(s) for sections S/A3, S/A4 and/or S/A5 located in the Steel/Aluminum category of listing above).

Appendix: Work Exempt from DSA Requirements for Structural Tests / Special Inspections

Application Number: 02-122130	School Name: Gladys Poet Christian Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-04-17 11:05:22

	WELDING:
<input type="checkbox"/>	7. Any support for exempt non-structural components given in CBC Section 1617A.1.18 (which replaces ASCE 7-16, Section 13.1.4) meeting the following: A) when supported on a floor/roof, <400# and resulting composite center of mass (including component's center of mass) $\leq 4'$ above supporting floor/roof, B) when hung from a wall or roof/floor, <20# for discrete units or <5 plf for distributed systems.

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS(SIGNATURE), 2022 CBC

Application Number:

02-122130

DSA File Number:

39-73

School Name:

Gladys Poet Christian Elementary School

Increment Number:

School District:

Tracy Unified School District

Date Created:

2024-04-17 11:05:22

Name of Architect or Engineer in general responsible charge:

Jeffrey Grau

Name of Structural Engineer (When structural design has been delegated):

Signature of Architect or Structural Engineer:

Date:

04/17/24

Note: To facilitate DSA electronic mark-ups and identification stamp application, DSA recommends against using secured electronic or digital signatures.

DSA STAMP

IDENTIFICATION STAMP
DIV. OF THE STATE ARCHITECT
APP: 02-122130 INC:
REVIEWED FOR
SS ☒ FLS ☒ ACS ☒
DATE: 04/17/2024

DSA 103-22: LIST OF REQUIRED VERIFIED REPORTS, CBC 2022

Application Number: 02-122130	School Name: Gladys Poet Christian Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-04-17 11:05:22

1. Structural Testing and Inspection: Laboratory Verified Report Form DSA 291

2. Shop Welding Inspection: Laboratory Verified Report Form DSA 291, or, for independently contracting SI, Special Inspection Verified Report Form DSA 292

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS, 2022 CBC

General

Application Number: 02-122131	School Name: Villalovoz Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-05-09 12:12:26

IMPORTANT: This form is only a summary list of structural tests and some of the special inspections required for the project. Generally, the structural tests and special inspections noted on this form are those that will be performed by the Geotechnical Engineer of Record, Laboratory of Record, or Special Inspector. The actual complete test and inspection program must be performed as detailed on the DSA approved documents. The appendix at the bottom of this form identifies work NOT subject to DSA requirements for special inspection or structural testing. The project inspector is responsible for providing inspection of all facets of construction, including but not limited to, special inspections not listed on this form such as structural wood framing, high-load wood diaphragms, cold-formed steel framing, anchorage of non-structural components, etc., per Title 24, Part 2, Chapter 17A (2022 CBC).

****NOTE:** Undefined section and table references found in this document are from the CBC, or California Building Code.

KEY TO COLUMNS

1. TYPE	2. PERFORMED BY
Continuous – Indicates that a continuous special inspection is required	GE (Geotechnical Engineer) – Indicates that the special inspection shall be performed by a registered geotechnical engineer or his or her authorized representative.
Periodic – Indicates that a periodic special inspection is required	LOR (Laboratory of Record) – Indicates that the test or special inspection shall be performed by a testing laboratory accepted in the DSA Laboratory Evaluation and Acceptance (LEA) Program. See CAC Section 4-335.
Test – Indicates that a test is required	PI (Project Inspector) – Indicates that the special inspection may be performed by a project inspector when specifically approved by DSA.
	SI (Special Inspection) – Indicates that the special inspection shall be performed by an appropriately qualified/approved special inspector.

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (SOILS), 2022 CBC

Table 1705A.6, Table 1705A.7, Table 1705A.8

Application Number: 02-122131	School Name: Villalovoz Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-05-09 12:12:26

Geotechnical Reports: Project does NOT have and does NOT require a geotechnical report

S1. GENERAL:				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input checked="" type="checkbox"/>	a. Verify that: <ul style="list-style-type: none">• Site has been prepared properly prior to placement of controlled fill and/or excavations for foundations.• Foundation excavations are extended to proper depth and have reached proper material.• Materials below footings must not contain loose material, mud, organic silt, organic clays, or peat.	See Notes	PI	Refer to specific items identified in the Appendix listing exemptions for limitations. Placement of controlled fill exceeding 12" depth under foundations and/or within the building envelope is not permitted without a geotechnical report.

S2. SOIL COMPACTION AND FILL:				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input checked="" type="checkbox"/>	a. Perform classification and testing of fill materials.	Test	LOR*	* Under the supervision of the geotechnical engineer.
<input checked="" type="checkbox"/>	b. Verify use of proper materials, densities and inspect lift thicknesses, placement and compaction during placement of fill.	Continuous	LOR*	* Under the supervision of a geotechnical engineer or LOR's engineering manager. Refer to specific items identified in the Appendix listing exemptions for limitations.
<input checked="" type="checkbox"/>	c. Compaction testing.	Test	LOR*	* Under the supervision of a geotechnical engineer or LOR's engineering manager. Refer to specific items identified in the Appendix listing exemptions for limitations.

S3. DRIVEN DEEP FOUNDATIONS (PILES):				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Verify pile materials, sizes and lengths comply with the requirements.	Continuous	GE*	* By geotechnical engineer or his or her qualified representative.

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (SOILS), 2022 CBC

Table 1705A.6, Table 1705A.7, Table 1705A.8

Application Number: 02-122131	School Name: Villalovoz Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-05-09 12:12:26

	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	b. Determine capacities of test piles and conduct additional load tests as required.	Test	LOR*	* Under the supervision of the geotechnical engineer.
<input type="checkbox"/>	c. Inspect driving operations and maintain complete and accurate records for each pile.	Continuous	GE*	* By geotechnical engineer or his or her qualified representative.
<input type="checkbox"/>	d. Verify locations of piles and their plumbness, confirm type and size of hammer, record number of blows per foot of penetration, determine required penetrations to achieve design capacity, record tip and butt elevations and record any pile damage.	Continuous	GE*	* By geotechnical engineer or his or her qualified representative.
<input type="checkbox"/>	e. Steel piles.	Provide tests and inspections per STEEL section below.		
<input type="checkbox"/>	f. Concrete piles and concrete filled piles.	Provide tests and inspections per CONCRETE section below.		
<input type="checkbox"/>	g. For specialty piles, perform additional inspections as determined by the registered design professional in responsible charge.	*	*	* As defined on drawings or specifications.

	S4. CAST-IN-PLACE DEEP FOUNDATIONS (PIERS):			
	Test or Special Inspection	Type	Performed By	Code References and Note
<input type="checkbox"/>	a. Inspect drilling operations and maintain complete and accurate records for each pier.	Continuous	PI	Continuous inspection to be provided by project inspector. Refer to specific items identified in the Appendix listing exemptions for limitations.
<input type="checkbox"/>	b. Verify pier locations, diameters, plumbness and lengths. Record concrete or grout volumes.	Continuous	PI	Continuous inspection to be provided by project inspector. Refer to specific items identified in the Appendix listing exemptions for limitations.
<input type="checkbox"/>	c. Concrete piers.	Provide tests and inspections per CONCRETE section below.		

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (SOILS), 2022 CBC

Table 1705A.6, Table 1705A.7, Table 1705A.8

Application Number: 02-122131	School Name: Villalovoz Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-05-09 12:12:26

	Test or Special Inspection	Type	Performed By	Code References and Notes
	S5. RETAINING WALLS:			
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Placement, compaction and inspection of backfill.	Continuous	GE*	1705A.6.1. * By geotechnical engineer or his or her qualified representative. (See section S2 above).
<input type="checkbox"/>	b. Placement of soil reinforcement and/or drainage devices.	Continuous	GE*	* By geotechnical engineer or his or her qualified representative.
<input type="checkbox"/>	c. Segmental retaining walls; inspect placement of units, dowels, connectors, etc.	Continuous	GE*	* By geotechnical engineer or his or her qualified representative. See DSA IR 18-2.
<input type="checkbox"/>	d. Concrete retaining walls.	Provide tests and inspections per CONCRETE section below.		
<input type="checkbox"/>	e. Masonry retaining walls.	Provide tests and inspections per MASONRY section below.		

	S6. OTHER SOILS:			
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Soil Improvements	Test	GE*	Submit a comprehensive report documenting final soil improvements constructed, construction observation and the results of the confirmation testing and analysis to CGS (California Geological Survey) for final acceptance. * By geotechnical engineer or his or her qualified representative.
<input type="checkbox"/>	b. Inspection of Soil Improvements	Continuous	GE*	* By geotechnical engineer or his or her qualified representative.
<input type="checkbox"/>	c.			

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (CONCRETE), 2022 CBC

Table 1705A.3; ACI 318-19 Sections 26.12 & 26.13

Application Number: 02-122131	School Name: Villalovoz Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-05-09 12:12:26

C1. CAST-IN-PLACE CONCRETE				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input checked="" type="checkbox"/>	a. Verify use of required design mix.	Continuous	SI	Table 1705A.3 Item 5, 1910A.1.
<input checked="" type="checkbox"/>	b. Identify, sample, and test reinforcing steel.	Test	LOR	1910A.2; ACI 318-19 Ch.20 and Section 26.6.1.2; DSA IR 17-10. (See Appendix (end of this form) for exemptions.)
<input checked="" type="checkbox"/>	c. During concrete placement, fabricate specimens for strength tests, perform slump and air content tests, and determine the temperature of the concrete.	Test	LOR	Table 1705A.3 Item 6; ACI 318-19 Sections 26.5 & 26.12.
<input checked="" type="checkbox"/>	d. Test concrete (f'c).	Test	LOR	1905A.1.17; ACI 318-19 Section 26.12.
<input checked="" type="checkbox"/>	e. Batch plant inspection:	See Notes	SI	Default of 'Continuous' per 1705A.3.3. If approved by DSA, batch plant inspection may be reduced to 'Periodic' subject to requirements in Section 1705A.3.3.1, or not required per 1705A.3.3.2. See IR 17-13. (See Appendix (end of this form) for exemptions.)
<input type="checkbox"/>	f. Welding of reinforcing steel.	Provide special inspection per STEEL, Category S/A4(d) & (e) and/or S/A5(g) & (h) below.		

C2. PRESTRESSED / POST-TENSIONED CONCRETE (IN ADDITION TO SECTION C1):				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Sample and test prestressing tendons and anchorages.	Test	LOR	1705A.3.4, 1910A.3
<input type="checkbox"/>	b. Inspect placement of prestressing tendons.	Periodic	SI	1705A.3.4, Table 1705A.3 Items 1 & 9.

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (CONCRETE), 2022 CBC

Table 1705A.3; ACI 318-19 Sections 26.12 & 26.13

Application Number: 02-122131	School Name: Villalovoz Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-05-09 12:12:26

	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	c. Verify in-situ concrete strength prior to stressing of post-tensioning tendons.	Periodic	SI	Table 1705A.3 Item 13. Special inspector to verify specified concrete strength test prior to stressing.
<input type="checkbox"/>	d. Inspect application of post-tensioning or prestressing forces and grouting of bonded prestressing tendons.	Continuous	SI	1705A.3.4, Table 1705A.3 Item 9; ACI 318-19 Section 26.13

	C3. PRECAST CONCRETE (IN ADDITION TO SECTION C1):			
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Inspect fabrication of precast concrete members.	Continuous	SI	ACI 318-19 Section 26.13, and PCI MNL-128 and -130.
<input type="checkbox"/>	b. Inspect erection of precast concrete members.	Periodic	SI*	Table 1705A.3 Item 10. * May be performed by PI when specifically approved by DSA.
<input type="checkbox"/>	c. For precast concrete diaphragm connections or reinforcement at joints classified as moderate or high deformability elements (MDE or HDE) in structures assigned to Seismic Design Category D, E or F, inspect such connections and reinforcement in the field for: 1. Installation of the embedded parts 2. Completion of the continuity of reinforcement across joints. 3. Completion of connections in the field.	Continuous	SI	Table 1705A.3; ACI 318-19 Section 26.13.1.3; ACI 550.5
<input type="checkbox"/>	d. Inspect installation tolerances of precast concrete diaphragm connections for compliance with ACI 550.5.	Periodic	SI	Table 1705A.3; ACI 318-19 Section 26.13.1.3; ACI 550.5

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (CONCRETE), 2022 CBC

Table 1705A.3; ACI 318-19 Sections 26.12 & 26.13

Application Number: 02-122131	School Name: Villalovoz Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-05-09 12:12:26

C4. SHOTCRETE (IN ADDITION TO SECTION C1):				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Inspect shotcrete placement for proper application techniques.	Continuous	SI	1705A.3.9, Table 1705A.3 Item 7, 1908A.1, 1908A.2, 1908A.3. See ACI 506.2-13 Section 3.4, ACI 506R-16.
<input type="checkbox"/>	b. Sample and test shotcrete (f'_c).	Test	LOR	1908A.2, 1705A.3.9

C5. POST-INSTALLED ANCHORS:				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Inspect installation of post-installed anchors	See Notes	SI*	1617A.1.19, Table 1705A.3 Item 4a (Continuous) & 4b (Periodic), 1705A.3.8 (See Appendix (end of this form) for exemptions). ACI 318-19 Section 26.13. * May be performed by the project inspector when specifically approved by DSA.
<input type="checkbox"/>	b. Test post-installed anchors.	Test	LOR	1910A.5. (See Appendix (end of this form) for exemptions.)

C6. OTHER CONCRETE:				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a.			

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (STEEL AND ALUMINUM), 2022 CBC

1705A.2.1, Table 1705A.2.1; AISC 303-16, AISC 341-16, AISC 358-16, AISC 360-16; AISI S100-20; RCSC 2014; AWS D1.1, AWS D1.2, AWS D1.3, AWS D1.4, AWS D1.8

Application Number: 02-122131	School Name: Villalovoz Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-05-09 12:12:26

S/A1. STRUCTURAL STEEL, COLD-FORMED STEEL AND ALUMINUM USED FOR STRUCTURAL PURPOSES				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input checked="" type="checkbox"/>	a. Verify identification of all materials and: • Mill certificates indicate material properties that comply with requirements. • Material sizes, types and grades comply with requirements.	Periodic	*	Table 1705A.2.1 Item 3a 3c. 2202A.1; AISI S100-20 Section A3.1 & A3.2, AISI S240-20 Section A3 & A5, AISI S220-20 Sections A4 & A6. * By special inspector or qualified technician when performed off-site.
<input checked="" type="checkbox"/>	b. Test unidentified materials	Test	LOR	2202A.1.
<input checked="" type="checkbox"/>	c. Examine seam welds of HSS shapes	Periodic	SI	DSA IR 17-3.
<input checked="" type="checkbox"/>	d. Verify and document steel fabrication per DSA-approved construction documents.	Periodic	SI	Not applicable to cold-formed steel light-frame construction, except for trusses (1705A.2.4).
<input type="checkbox"/>	e. Buckling restrained braces.	Test	LOR	Testing and special inspections in accordance with IR 22-4.

S/A2. HIGH-STRENGTH BOLTS:				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Verify identification markings and manufacturer's certificates of compliance conform to ASTM standards specified in the DSA-approved documents.	Periodic	SI	Table 1705A.2.1 Items 1a & 1b, 2202A.1; AISC 360-16 Section A3.3, J3.1, and N3.2; RCSC 2014 Section 1.5 & 2.1; DSA IR 17-8 & DSA IR 17-9.
<input type="checkbox"/>	b. Test high-strength bolts, nuts and washers.	Test	LOR	Table 1705A.2.1 Item 1c, 2213A.1; RCSC 2014 Section 7.2; DSA IR 17-8.
<input type="checkbox"/>	c. Bearing-type ("snug tight") connections.	Periodic	SI	Table 1705A.2.1 Item 2a, 1705A.2.6, 2204A.2; AISC 360-16 J3.1, J3.2, M2.5 & N5.6; RCSC 2014 Section 9.1; DSA IR 17-9.
<input type="checkbox"/>	d. Pretensioned and slip-critical connections.	*	SI	Table 1705A.2.1 Items 2b & 2c, 1705A.2.6, 2204A.2; AISC 360-16 J3.1, J3.2, M2.5 & N5.6; RCSC 2014 Sections 9.2 & 9.3; DSA IR 17-9. **"Continuous" or "Periodic" depends on the tightening method used.

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (STEEL AND ALUMNINUM), 2022 CBC

1705A.2.1, Table 1705A.2.1; AISC 303-16, AISC 341-16, AISC 358-16, AISC 360-16; AISI S100-20; RCSC 2014; AWS D1.1, AWS D1.2, AWS D1.3, AWS D1.4, AWS D1.8

Application Number: 02-122131	School Name: Villalovoz Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-05-09 12:12:26

S/A3. WELDING:				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input checked="" type="checkbox"/>	a. Verify weld filler material identification markings per AWS designation listed on the DSA-approved documents and the WPS.	Periodic	SI	1705A.2.5, Table 1705A.2.1 Items 4 & 5; AWS D1.1 and AWS D1.8 for structural steel; AWS D1.2 for Aluminum; AWS D1.3 for cold-formed steel; AWS D1.4 for reinforcing steel; DSA IR 17-3.
<input checked="" type="checkbox"/>	b. Verify weld filler material manufacturer's certificate of compliance.	Periodic	SI	DSA IR 17-3.
<input checked="" type="checkbox"/>	c. Verify WPS, welder qualifications and equipment.	Periodic	SI	DSA IR 17-3.

S/A4. SHOP WELDING (IN ADDITION TO SECTION S/A3):				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input checked="" type="checkbox"/>	a. Inspect groove welds, multi-pass fillet welds, single pass fillet welds > 5/16", plug and slot welds.	Continuous	SI	Table 1705A.2.1 Items 5a.1 4; AISC 360-16 (and AISC 341-16 as applicable); DSA IR 17-3.
<input checked="" type="checkbox"/>	b. Inspect single-pass fillet welds ≤ 5/16", floor and roof deck welds.	Periodic	SI	1705A.2.2, Table 1705A.2.1 Items 5a.5 & 5a.6; AISC 360-16 (and AISC 341-16 as applicable); DSA IR 17-3.
<input type="checkbox"/>	c. Inspect welding of stairs and railing systems.	Periodic	SI	1705A.2.1; AISC 360-16 (and AISC 341-16 as applicable); AWS D1.1 & D1.3; DSA IR 17-3.
<input type="checkbox"/>	d. Verification of reinforcing steel weldability other than ASTM A706.	Periodic	SI	1705A.3.1; AWS D1.4; DSA IR 17-3. Verify carbon equivalent reported on mill certificates.
<input type="checkbox"/>	e. Inspect welding of reinforcing steel.	Continuous	SI	Table 1705A.2.1 Item 5b, 1705A.3.1, Table 1705A.3 Item 2, 1903A.8; AWS D1.4; DSA IR 17-3.

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (STEEL AND ALUMNINUM), 2022 CBC

1705A.2.1, Table 1705A.2.1; AISC 303-16, AISC 341-16, AISC 358-16, AISC 360-16; AISI S100-20; RCSC 2014; AWS D1.1, AWS D1.2, AWS D1.3, AWS D1.4, AWS D1.8

Application Number: 02-122131	School Name: Villalovoz Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-05-09 12:12:26

	Test or Special Inspection	Type	Performed By	Code References and Notes
	S/A5. FIELD WELDING (IN ADDITION TO SECTION S/A3):			
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input checked="" type="checkbox"/>	a. Inspect groove welds, multi-pass fillet welds, single pass fillet welds > 5/16", plug and slot welds.	Continuous	SI	Table 1705A.2.1 Items 5a.1 4; AISC 360-16 (AISC 341-16 as applicable); DSA IR 17-3.
<input type="checkbox"/>	b. Inspect single-pass fillet welds ≤ 5/16".	Periodic	SI	Table 1705A.2.1 Item 5a.5; AISC 360-16 (AISC 341-16 as applicable); DSA IR 17-3.
<input type="checkbox"/>	c. Inspect end-welded studs (ASTM A-108) installation (including bend test).	Periodic	SI	2213A.2; AISC 360-16 (AISC 341-16 as applicable); AWS D1.1; DSA IR 17-3.
<input type="checkbox"/>	d. Inspect floor and roof deck welds.	Periodic	SI	1705A.2.2, Table 1705A.2.1 Item 5a.6; AISC 360-16 (AISC 341-16 as applicable); AWS D1.3; DSA IR 17-3.
<input type="checkbox"/>	e. Inspect welding of structural cold-formed steel.	Periodic	SI*	1705A.2.5; AWS D1.3; DSA IR 17-3. The quality control provisions of AISI S240-20 Chapter D shall also apply. * May be performed by the project inspector when specifically approved by DSA.
<input type="checkbox"/>	f. Inspect welding of stairs and railing systems.	Periodic	SI*	1705A.2.1; AISC 360-16 (AISC 341-16 as applicable); AWS D1.1 & D1.3; DSA IR 17-3. * May be performed by the project inspector when specifically approved by DSA.
<input type="checkbox"/>	g. Verification of reinforcing steel weldability.	Periodic	SI	1705A.3.1; AWS D1.4; DSA IR 17-3. Verify carbon equivalent reported on mill certificates.
<input type="checkbox"/>	h. Inspect welding of reinforcing steel.	Continuous	SI	Table 1705A.2.1 Item 5b, 1705A.3.1, Table 1705A.3 Item 2, 1903A.8; AWS D1.4; DSA IR 17-3.

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (STEEL AND ALUMNINUM), 2022 CBC

1705A.2.1, Table 1705A.2.1; AISC 303-16, AISC 341-16, AISC 358-16, AISC 360-16; AISI S100-20; RCSC 2014; AWS D1.1, AWS D1.2, AWS D1.3, AWS D1.4, AWS D1.8

Application Number:

02-122131

School Name:

Villalovoz Elementary School

School District:

Tracy Unified School District

DSA File Number:

39-73

Increment Number:

Date Created:

2024-05-09 12:12:26

	Test or Special Inspection	Type	Performed By	Code References and Notes
	S/A6. NONDESTRUCTIVE TESTING:			
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Ultrasonic	Test	LOR	1705A.2.1, 1705A.2.5; AISC 341-16 J6.2, AISC 360-16 N5.5; AWS D1.1, AWS D1.8; DSA IR 17-2.
<input checked="" type="checkbox"/>	b. Magnetic Particle	Test	LOR	1705A.2.1, 1705A.2.5; AISC 341-16 J6.2, AISC 360-16 N5.5; AWS D1.1, AWS D1.8; DSA IR 17-2.
<input type="checkbox"/>	c.	Test	LOR	

	S/A7. STEEL JOISTS AND TRUSSES:			
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Verify size, type and grade for all chord and web members as well as connectors and weld filler material; verify joist profile, dimensions and camber (if applicable); verify all weld locations, lengths and profiles; mark or tag each joist.	Continuous	SI	1705A.2.3, Table 1705A.2.3; AWS D1.1; DSA IR 22-3 for steel joists only. 1705A.2.4; AWS D1.3 for cold-formed steel trusses.

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (STEEL AND ALUMNINUM), 2022 CBC

1705A.2.1, Table 1705A.2.1; AISC 303-16, AISC 341-16, AISC 358-16, AISC 360-16; AISI S100-20; RCSC 2014; AWS D1.1, AWS D1.2, AWS D1.3, AWS D1.4, AWS D1.8

Application Number: 02-122131	School Name: Villalovoz Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-05-09 12:12:26

	Test or Special Inspection	Type	Performed By	Code References and Notes
	S/A8. SPRAYED FIRE-RESISTANT MATERIALS:			
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Examine structural steel surface conditions, inspect application, take samples, measure thickness and verify compliance of all aspects of application with DSA-approved documents.	Periodic	SI	1705A.15, 1705A.15.1, 1705A.15.2, 1705A.15.3, 1705A.15.4, 1705A.15.5, 1705A.15.6.
<input type="checkbox"/>	b. Test density.	Test	LOR	1705A.15.1, 1705A.15.5, ASTM E605
<input type="checkbox"/>	c. Bond strength adhesion/cohesion.	Test	LOR	1705A.15.1, 1705A.15.6, ASTM E736

	S/A9. ANCHOR BOLTS AND ANCHOR RODS:			
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Anchor Bolts and Anchor Rods	Test	LOR	Identify, sample and test anchor bolts and anchor rods not meeting exemptions identified in Section 1 of IR 17-11.
<input type="checkbox"/>	b. Threaded rod not used for foundation anchorage.	Test	LOR	Identify, sample and test threaded rods not meeting exemptions identified in Section 1 of IR 17-11.

	S/A10. STORAGE RACK SYSTEMS:			
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Materials used, to verify compliance with one or more of the material test reports in accordance with the approved construction documents.	Periodic	SI	Table 1705A.13.7
<input type="checkbox"/>	b. Fabricated storage rack elements.	Periodic	SI	1704A.2.5; Table 1705A.13.7

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (STEEL AND ALUMNINUM), 2022 CBC

1705A.2.1, Table 1705A.2.1; AISC 303-16, AISC 341-16, AISC 358-16, AISC 360-16; AISI S100-20; RCSC 2014; AWS D1.1, AWS D1.2, AWS D1.3, AWS D1.4, AWS D1.8

Application Number:

02-122131

School Name:

Villalovoz Elementary School

School District:

Tracy Unified School District

DSA File Number:

39-73

Increment Number:

Date Created:

2024-05-09 12:12:26

	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	c. Storage rack anchorage installation.	Periodic	SI	ANSI/MH16.1 Section 7.3.2; Table 1705A.13.7
<input type="checkbox"/>	d. Completed storage rack system to indicate compliance with the approved construction documents.	Periodic	SI*	Table 1705A.13.7; * May be preformed by the project inspector when specifically approved by DSA.

	S/A11. Other Steel			
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input checked="" type="checkbox"/>	a. Shop welding-inspect welding of cold-formed steel periodic/special inspector	Periodic	SI	
<input checked="" type="checkbox"/>	b. Hollow bolts	Continuous	PI	Verify the torque installation torque

Appendix: Work Exempt from DSA Requirements for Structural Tests / Special Inspections

Application Number: 02-122131	School Name: Villalovoz Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-05-09 12:12:26

Exempt items given in DSA IR A-22 or the 2022 CBC (including DSA amendments) and those items identified below with a check mark by the design professional are NOT subject to DSA requirements for the structural tests / special inspections noted. **Items marked as exempt shall be identified on the approved construction documents.** The project inspector shall verify all construction complies with the approved construction documents.

	SOILS:
<input type="checkbox"/>	1. Deep foundations acting as a cantilever footing with a design based on minimum allowable pressures per CBC Table 1806A.2 and without a geotechnical report for the following cases: A) free standing sign or scoreboard, B) cell or antenna towers and poles less than 35'-0" tall (e.g., lighting poles, flag poles, poles supporting open mesh fences, etc.), C) single-story structure with dead load less than 5 psf (e.g., open fabric shade structure), or D) covered walkway structure with an apex height less than 10'-0" above adjacent grade.
<input type="checkbox"/>	2. Shallow foundations, etc. are exempt from special inspections and testing by a Geotechnical Engineer for the following cases: A) buildings without a geotechnical report and meeting the exception item #1 criteria in CBC Section 1803A.2 supported by native soil (any excavation depth) or fill soil (not exceeding 12" depth per CBC Section 1804A.6), B) soil scarification/recompaction not exceeding 12" depth, C) native or fill soil supporting exterior non-structural flatwork (e.g., sidewalks, site concrete ramps, site stairs, parking lots, driveways, etc.), D) unpaved landscaping and playground areas, or E) utility trench backfill with depth not exceeding 12".

	CONCRETE/MASONRY:
<input type="checkbox"/>	1. Post-installed anchors for the following: A) exempt non-structural components (e.g., mechanical, electrical, plumbing equipment - see item 7 for "Welding" in the Appendix below) given in CBC Section 1617A.1.18 (which replaces ASCE 7-16, Section 13.1.4) or B) interior nonstructural wall partitions meeting criteria listed in exempt item 3 for "Welding" in the Appendix below
<input type="checkbox"/>	2. Concrete batch plant inspection is not required for items given in CBC Section 1705A.3.3.2 subject to the requirements and limitations in that section.
<input type="checkbox"/>	3. Non-bearing non-shear masonry walls may be exempt from certain DSA masonry testing and special inspection items as allowed per DSA IR 21-1. Refer to construction documents for specific exemptions accordingly for each applicable wall condition shown in Appendix A of IR 21-1.
<input type="checkbox"/>	4. Epoxy shear dowels in site flatwork and/or other non-structural concrete.

Appendix: Work Exempt from DSA Requirements for Structural Tests / Special Inspections

Application Number: 02-122131	School Name: Villalovoz Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-05-09 12:12:26

	CONCRETE/MASONRY:
<input type="checkbox"/>	5. Testing of reinforcing bars is not required for items given in CBC Section 1910A.2 subject to the requirements and limitations in that section.

	WELDING:
<input type="checkbox"/>	1. Solid-clad and open-mesh fences, gates with maximum leaf span of 10', and gates with a maximum rolling section of 10' all having an apex height less than 8'-0" above lowest adjacent grade. When located above circulation or occupied space below, these gates/fences are not located within 1.5x gate/fence height (max 8'-0") to the edge of floor or roof.
<input type="checkbox"/>	2. Handrails, guardrails, and modular or relocatable ramps associated with walking surfaces less than 30" above adjacent grade (excluding post base connections per the 'Exception' language in Section 1705A.2.1); fillet welds shall not be ground flush.
<input type="checkbox"/>	3. Non-structural interior cold-formed steel framing spanning less than 15'-0", such as in interior partitions, interior soffits, etc. supporting only self weight and light-weight finishes or adhered tile, masonry, stone, or terra cotta veneer no more than 5/8" thickness and apex less than 20'-0" in height and not over an exit way. Maximum tributary load to a member shall not exceed the equivalent of that occurring from a 10'x10' opening in a 15' tall wall for a header or king stud.
<input type="checkbox"/>	4. Manufactured support frames and curbs using hot rolled or cold-formed steel (i.e., light gauge) for mechanical, electrical, or plumbing equipment weighing less than 2000# (equipment only) (connections of such frames to superstructure elements using welding will require special inspection as noted in selected item(s) for Sections S/A3, S/A4 and/or S/A5 of listing above).
<input type="checkbox"/>	5. Manufactured components (e.g., Tolco, B-Line, Afcon, etc.) for mechanical, electrical, or plumbing hanger support and bracing (connections of such components to superstructure elements using welding will require special inspection as noted in selected item(s) for Sections S/A3, S/A4 and/or S/A5 of listing above).
<input type="checkbox"/>	6. TV Brackets, projector mounts with a valid listing (see DSA IR A-5) and recreational equipment (e.g., playground structures, basketball backstops, etc.) (connections of such elements to superstructure elements using welding will require special inspection as noted in selected item(s) for sections S/A3, S/A4 and/or S/A5 located in the Steel/Aluminum category of listing above).

Appendix: Work Exempt from DSA Requirements for Structural Tests / Special Inspections

Application Number: 02-122131	School Name: Villalovoz Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-05-09 12:12:26

	WELDING:
<input type="checkbox"/>	7. Any support for exempt non-structural components given in CBC Section 1617A.1.18 (which replaces ASCE 7-16, Section 13.1.4) meeting the following: A) when supported on a floor/roof, <400# and resulting composite center of mass (including component's center of mass) ≤4' above supporting floor/roof, B) when hung from a wall or roof/floor, <20# for discrete units or <5 plf for distributed systems.

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS(SIGNATURE), 2022 CBC

Application Number:

02-122131

School Name:

Villalovoz Elementary School

School District:

Tracy Unified School District

DSA File Number:

39-73

Increment Number:

Date Created:

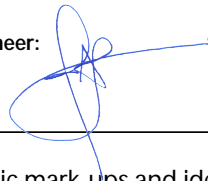
2024-05-09 12:12:26

Name of Architect or Engineer in general responsible charge:

Jeffrey Grau

Name of Structural Engineer (When structural design has been delegated):

Signature of Architect or Structural Engineer:



Date:

05/09/24

Note: To facilitate DSA electronic mark-ups and identification stamp application, DSA recommends against using secured electronic or digital signatures.

DSA STAMP

DSA 103-22: LIST OF REQUIRED VERIFIED REPORTS, CBC 2022

Application Number:

02-122131

DSA File Number:

39-73

School Name:

Villalovoz Elementary School

Increment Number:

School District:

Tracy Unified School District

Date Created:

2024-05-09 12:12:26

1. Structural Testing and Inspection: Laboratory Verified Report Form DSA 291

2. Shop Welding Inspection: Laboratory Verified Report Form DSA 291, or, for independently contracting SI, Special Inspection Verified Report Form DSA 292

3. Field Welding Inspection: Laboratory Verified Report Form DSA 291, or, for independently contracting SI, Special Inspection Verified Report Form DSA 292

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS, 2022 CBC

General

Application Number: 02-122128	School Name: Wanda Hirsch Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-04-11 14:09:51

IMPORTANT: This form is only a summary list of structural tests and some of the special inspections required for the project. Generally, the structural tests and special inspections noted on this form are those that will be performed by the Geotechnical Engineer of Record, Laboratory of Record, or Special Inspector. The actual complete test and inspection program must be performed as detailed on the DSA approved documents. The appendix at the bottom of this form identifies work NOT subject to DSA requirements for special inspection or structural testing. The project inspector is responsible for providing inspection of all facets of construction, including but not limited to, special inspections not listed on this form such as structural wood framing, high-load wood diaphragms, cold-formed steel framing, anchorage of non-structural components, etc., per Title 24, Part 2, Chapter 17A (2022 CBC).

****NOTE:** Undefined section and table references found in this document are from the CBC, or California Building Code.

KEY TO COLUMNS

1. TYPE	2. PERFORMED BY
Continuous – Indicates that a continuous special inspection is required	GE (Geotechnical Engineer) – Indicates that the special inspection shall be performed by a registered geotechnical engineer or his or her authorized representative.
Periodic – Indicates that a periodic special inspection is required	LOR (Laboratory of Record) – Indicates that the test or special inspection shall be performed by a testing laboratory accepted in the DSA Laboratory Evaluation and Acceptance (LEA) Program. See CAC Section 4-335.
Test – Indicates that a test is required	PI (Project Inspector) – Indicates that the special inspection may be performed by a project inspector when specifically approved by DSA.
	SI (Special Inspection) – Indicates that the special inspection shall be performed by an appropriately qualified/approved special inspector.

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (SOILS), 2022 CBC

Table 1705A.6, Table 1705A.7, Table 1705A.8

Application Number: 02-122128	School Name: Wanda Hirsch Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-04-11 14:09:51

Geotechnical Reports: Project does NOT have and does NOT require a geotechnical report

S1. GENERAL:				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input checked="" type="checkbox"/>	a. Verify that: <ul style="list-style-type: none">• Site has been prepared properly prior to placement of controlled fill and/or excavations for foundations.• Foundation excavations are extended to proper depth and have reached proper material.• Materials below footings must not contain loose material, mud, organic silt, organic clays, or peat.	See Notes	PI	Refer to specific items identified in the Appendix listing exemptions for limitations. Placement of controlled fill exceeding 12" depth under foundations and/or within the building envelope is not permitted without a geotechnical report.

S2. SOIL COMPACTION AND FILL:				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input checked="" type="checkbox"/>	a. Perform classification and testing of fill materials.	Test	LOR*	* Under the supervision of the geotechnical engineer.
<input checked="" type="checkbox"/>	b. Verify use of proper materials, densities and inspect lift thicknesses, placement and compaction during placement of fill.	Continuous	LOR*	* Under the supervision of a geotechnical engineer or LOR's engineering manager. Refer to specific items identified in the Appendix listing exemptions for limitations.
<input checked="" type="checkbox"/>	c. Compaction testing.	Test	LOR*	* Under the supervision of a geotechnical engineer or LOR's engineering manager. Refer to specific items identified in the Appendix listing exemptions for limitations.

S3. DRIVEN DEEP FOUNDATIONS (PILES):				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Verify pile materials, sizes and lengths comply with the requirements.	Continuous	GE*	* By geotechnical engineer or his or her qualified representative.

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (SOILS), 2022 CBC

Table 1705A.6, Table 1705A.7, Table 1705A.8

Application Number: 02-122128	School Name: Wanda Hirsch Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-04-11 14:09:51

	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	b. Determine capacities of test piles and conduct additional load tests as required.	Test	LOR*	* Under the supervision of the geotechnical engineer.
<input type="checkbox"/>	c. Inspect driving operations and maintain complete and accurate records for each pile.	Continuous	GE*	* By geotechnical engineer or his or her qualified representative.
<input type="checkbox"/>	d. Verify locations of piles and their plumbness, confirm type and size of hammer, record number of blows per foot of penetration, determine required penetrations to achieve design capacity, record tip and butt elevations and record any pile damage.	Continuous	GE*	* By geotechnical engineer or his or her qualified representative.
<input type="checkbox"/>	e. Steel piles.	Provide tests and inspections per STEEL section below.		
<input type="checkbox"/>	f. Concrete piles and concrete filled piles.	Provide tests and inspections per CONCRETE section below.		
<input type="checkbox"/>	g. For specialty piles, perform additional inspections as determined by the registered design professional in responsible charge.	*	*	* As defined on drawings or specifications.

	S4. CAST-IN-PLACE DEEP FOUNDATIONS (PIERS):			
	Test or Special Inspection	Type	Performed By	Code References and Note
<input type="checkbox"/>	a. Inspect drilling operations and maintain complete and accurate records for each pier.	Continuous	PI	Continuous inspection to be provided by project inspector. Refer to specific items identified in the Appendix listing exemptions for limitations.
<input type="checkbox"/>	b. Verify pier locations, diameters, plumbness and lengths. Record concrete or grout volumes.	Continuous	PI	Continuous inspection to be provided by project inspector. Refer to specific items identified in the Appendix listing exemptions for limitations.
<input type="checkbox"/>	c. Concrete piers.	Provide tests and inspections per CONCRETE section below.		

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (SOILS), 2022 CBC

Table 1705A.6, Table 1705A.7, Table 1705A.8

Application Number: 02-122128	School Name: Wanda Hirsch Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-04-11 14:09:51

	Test or Special Inspection	Type	Performed By	Code References and Notes
	S5. RETAINING WALLS:			
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Placement, compaction and inspection of backfill.	Continuous	GE*	1705A.6.1. * By geotechnical engineer or his or her qualified representative. (See section S2 above).
<input type="checkbox"/>	b. Placement of soil reinforcement and/or drainage devices.	Continuous	GE*	* By geotechnical engineer or his or her qualified representative.
<input type="checkbox"/>	c. Segmental retaining walls; inspect placement of units, dowels, connectors, etc.	Continuous	GE*	* By geotechnical engineer or his or her qualified representative. See DSA IR 18-2.
<input type="checkbox"/>	d. Concrete retaining walls.	Provide tests and inspections per CONCRETE section below.		
<input type="checkbox"/>	e. Masonry retaining walls.	Provide tests and inspections per MASONRY section below.		

	S6. OTHER SOILS:			
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Soil Improvements	Test	GE*	Submit a comprehensive report documenting final soil improvements constructed, construction observation and the results of the confirmation testing and analysis to CGS (California Geological Survey) for final acceptance. * By geotechnical engineer or his or her qualified representative.
<input type="checkbox"/>	b. Inspection of Soil Improvements	Continuous	GE*	* By geotechnical engineer or his or her qualified representative.
<input type="checkbox"/>	c.			

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (CONCRETE), 2022 CBC

Table 1705A.3; ACI 318-19 Sections 26.12 & 26.13

Application Number: 02-122128	School Name: Wanda Hirsch Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-04-11 14:09:51

C1. CAST-IN-PLACE CONCRETE				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input checked="" type="checkbox"/>	a. Verify use of required design mix.	Continuous	SI	Table 1705A.3 Item 5, 1910A.1.
<input checked="" type="checkbox"/>	b. Identify, sample, and test reinforcing steel.	Test	LOR	1910A.2; ACI 318-19 Ch.20 and Section 26.6.1.2; DSA IR 17-10. (See Appendix (end of this form) for exemptions.)
<input checked="" type="checkbox"/>	c. During concrete placement, fabricate specimens for strength tests, perform slump and air content tests, and determine the temperature of the concrete.	Test	LOR	Table 1705A.3 Item 6; ACI 318-19 Sections 26.5 & 26.12.
<input checked="" type="checkbox"/>	d. Test concrete (f'c).	Test	LOR	1905A.1.17; ACI 318-19 Section 26.12.
<input checked="" type="checkbox"/>	e. Batch plant inspection:	See Notes	SI	Default of 'Continuous' per 1705A.3.3. If approved by DSA, batch plant inspection may be reduced to 'Periodic' subject to requirements in Section 1705A.3.3.1, or not required per 1705A.3.3.2. See IR 17-13. (See Appendix (end of this form) for exemptions.)
<input type="checkbox"/>	f. Welding of reinforcing steel.	Provide special inspection per STEEL, Category S/A4(d) & (e) and/or S/A5(g) & (h) below.		

C2. PRESTRESSED / POST-TENSIONED CONCRETE (IN ADDITION TO SECTION C1):				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Sample and test prestressing tendons and anchorages.	Test	LOR	1705A.3.4, 1910A.3
<input type="checkbox"/>	b. Inspect placement of prestressing tendons.	Periodic	SI	1705A.3.4, Table 1705A.3 Items 1 & 9.

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (CONCRETE), 2022 CBC

Table 1705A.3; ACI 318-19 Sections 26.12 & 26.13

Application Number: 02-122128	School Name: Wanda Hirsch Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-04-11 14:09:51

	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	c. Verify in-situ concrete strength prior to stressing of post-tensioning tendons.	Periodic	SI	Table 1705A.3 Item 13. Special inspector to verify specified concrete strength test prior to stressing.
<input type="checkbox"/>	d. Inspect application of post-tensioning or prestressing forces and grouting of bonded prestressing tendons.	Continuous	SI	1705A.3.4, Table 1705A.3 Item 9; ACI 318-19 Section 26.13

	C3. PRECAST CONCRETE (IN ADDITION TO SECTION C1):			
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Inspect fabrication of precast concrete members.	Continuous	SI	ACI 318-19 Section 26.13, and PCI MNL-128 and -130.
<input type="checkbox"/>	b. Inspect erection of precast concrete members.	Periodic	SI*	Table 1705A.3 Item 10. * May be performed by PI when specifically approved by DSA.
<input type="checkbox"/>	c. For precast concrete diaphragm connections or reinforcement at joints classified as moderate or high deformability elements (MDE or HDE) in structures assigned to Seismic Design Category D, E or F, inspect such connections and reinforcement in the field for: 1. Installation of the embedded parts 2. Completion of the continuity of reinforcement across joints. 3. Completion of connections in the field.	Continuous	SI	Table 1705A.3; ACI 318-19 Section 26.13.1.3; ACI 550.5
<input type="checkbox"/>	d. Inspect installation tolerances of precast concrete diaphragm connections for compliance with ACI 550.5.	Periodic	SI	Table 1705A.3; ACI 318-19 Section 26.13.1.3; ACI 550.5

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (CONCRETE), 2022 CBC

Table 1705A.3; ACI 318-19 Sections 26.12 & 26.13

Application Number: 02-122128	School Name: Wanda Hirsch Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-04-11 14:09:51

C4. SHOTCRETE (IN ADDITION TO SECTION C1):				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Inspect shotcrete placement for proper application techniques.	Continuous	SI	1705A.3.9, Table 1705A.3 Item 7, 1908A.1, 1908A.2, 1908A.3. See ACI 506.2-13 Section 3.4, ACI 506R-16.
<input type="checkbox"/>	b. Sample and test shotcrete (f'_c).	Test	LOR	1908A.2, 1705A.3.9

C5. POST-INSTALLED ANCHORS:				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Inspect installation of post-installed anchors	See Notes	SI*	1617A.1.19, Table 1705A.3 Item 4a (Continuous) & 4b (Periodic), 1705A.3.8 (See Appendix (end of this form) for exemptions). ACI 318-19 Section 26.13. * May be performed by the project inspector when specifically approved by DSA.
<input type="checkbox"/>	b. Test post-installed anchors.	Test	LOR	1910A.5. (See Appendix (end of this form) for exemptions.)

C6. OTHER CONCRETE:				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a.			

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (STEEL AND ALUMINUM), 2022 CBC

1705A.2.1, Table 1705A.2.1; AISC 303-16, AISC 341-16, AISC 358-16, AISC 360-16; AISI S100-20; RCSC 2014; AWS D1.1, AWS D1.2, AWS D1.3, AWS D1.4, AWS D1.8

Application Number: 02-122128	School Name: Wanda Hirsch Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-04-11 14:09:51

S/A1. STRUCTURAL STEEL, COLD-FORMED STEEL AND ALUMINUM USED FOR STRUCTURAL PURPOSES				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input checked="" type="checkbox"/>	a. Verify identification of all materials and: • Mill certificates indicate material properties that comply with requirements. • Material sizes, types and grades comply with requirements.	Periodic	*	Table 1705A.2.1 Item 3a 3c. 2202A.1; AISI S100-20 Section A3.1 & A3.2, AISI S240-20 Section A3 & A5, AISI S220-20 Sections A4 & A6. * By special inspector or qualified technician when performed off-site.
<input checked="" type="checkbox"/>	b. Test unidentified materials	Test	LOR	2202A.1.
<input checked="" type="checkbox"/>	c. Examine seam welds of HSS shapes	Periodic	SI	DSA IR 17-3.
<input checked="" type="checkbox"/>	d. Verify and document steel fabrication per DSA-approved construction documents.	Periodic	SI	Not applicable to cold-formed steel light-frame construction, except for trusses (1705A.2.4).
<input type="checkbox"/>	e. Buckling restrained braces.	Test	LOR	Testing and special inspections in accordance with IR 22-4.

S/A2. HIGH-STRENGTH BOLTS:				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Verify identification markings and manufacturer's certificates of compliance conform to ASTM standards specified in the DSA-approved documents.	Periodic	SI	Table 1705A.2.1 Items 1a & 1b, 2202A.1; AISC 360-16 Section A3.3, J3.1, and N3.2; RCSC 2014 Section 1.5 & 2.1; DSA IR 17-8 & DSA IR 17-9.
<input type="checkbox"/>	b. Test high-strength bolts, nuts and washers.	Test	LOR	Table 1705A.2.1 Item 1c, 2213A.1; RCSC 2014 Section 7.2; DSA IR 17-8.
<input type="checkbox"/>	c. Bearing-type ("snug tight") connections.	Periodic	SI	Table 1705A.2.1 Item 2a, 1705A.2.6, 2204A.2; AISC 360-16 J3.1, J3.2, M2.5 & N5.6; RCSC 2014 Section 9.1; DSA IR 17-9.
<input type="checkbox"/>	d. Pretensioned and slip-critical connections.	*	SI	Table 1705A.2.1 Items 2b & 2c, 1705A.2.6, 2204A.2; AISC 360-16 J3.1, J3.2, M2.5 & N5.6; RCSC 2014 Sections 9.2 & 9.3; DSA IR 17-9. **"Continuous" or "Periodic" depends on the tightening method used.

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (STEEL AND ALUMINUM), 2022 CBC

1705A.2.1, Table 1705A.2.1; AISC 303-16, AISC 341-16, AISC 358-16, AISC 360-16; AISI S100-20; RCSC 2014; AWS D1.1, AWS D1.2, AWS D1.3, AWS D1.4, AWS D1.8

Application Number: 02-122128	School Name: Wanda Hirsch Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-04-11 14:09:51

S/A3. WELDING:				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input checked="" type="checkbox"/>	a. Verify weld filler material identification markings per AWS designation listed on the DSA-approved documents and the WPS.	Periodic	SI	1705A.2.5, Table 1705A.2.1 Items 4 & 5; AWS D1.1 and AWS D1.8 for structural steel; AWS D1.2 for Aluminum; AWS D1.3 for cold-formed steel; AWS D1.4 for reinforcing steel; DSA IR 17-3.
<input checked="" type="checkbox"/>	b. Verify weld filler material manufacturer's certificate of compliance.	Periodic	SI	DSA IR 17-3.
<input checked="" type="checkbox"/>	c. Verify WPS, welder qualifications and equipment.	Periodic	SI	DSA IR 17-3.

S/A4. SHOP WELDING (IN ADDITION TO SECTION S/A3):				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input checked="" type="checkbox"/>	a. Inspect groove welds, multi-pass fillet welds, single pass fillet welds > 5/16", plug and slot welds.	Continuous	SI	Table 1705A.2.1 Items 5a.1 4; AISC 360-16 (and AISC 341-16 as applicable); DSA IR 17-3.
<input checked="" type="checkbox"/>	b. Inspect single-pass fillet welds ≤ 5/16", floor and roof deck welds.	Periodic	SI	1705A.2.2, Table 1705A.2.1 Items 5a.5 & 5a.6; AISC 360-16 (and AISC 341-16 as applicable); DSA IR 17-3.
<input type="checkbox"/>	c. Inspect welding of stairs and railing systems.	Periodic	SI	1705A.2.1; AISC 360-16 (and AISC 341-16 as applicable); AWS D1.1 & D1.3; DSA IR 17-3.
<input type="checkbox"/>	d. Verification of reinforcing steel weldability other than ASTM A706.	Periodic	SI	1705A.3.1; AWS D1.4; DSA IR 17-3. Verify carbon equivalent reported on mill certificates.
<input type="checkbox"/>	e. Inspect welding of reinforcing steel.	Continuous	SI	Table 1705A.2.1 Item 5b, 1705A.3.1, Table 1705A.3 Item 2, 1903A.8; AWS D1.4; DSA IR 17-3.

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (STEEL AND ALUMNINUM), 2022 CBC

1705A.2.1, Table 1705A.2.1; AISC 303-16, AISC 341-16, AISC 358-16, AISC 360-16; AISI S100-20; RCSC 2014; AWS D1.1, AWS D1.2, AWS D1.3, AWS D1.4, AWS D1.8

Application Number: 02-122128	School Name: Wanda Hirsch Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-04-11 14:09:51

	Test or Special Inspection	Type	Performed By	Code References and Notes
	S/A5. FIELD WELDING (IN ADDITION TO SECTION S/A3):			
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input checked="" type="checkbox"/>	a. Inspect groove welds, multi-pass fillet welds, single pass fillet welds > 5/16", plug and slot welds.	Continuous	SI	Table 1705A.2.1 Items 5a.1 4; AISC 360-16 (AISC 341-16 as applicable); DSA IR 17-3.
<input type="checkbox"/>	b. Inspect single-pass fillet welds ≤ 5/16".	Periodic	SI	Table 1705A.2.1 Item 5a.5; AISC 360-16 (AISC 341-16 as applicable); DSA IR 17-3.
<input type="checkbox"/>	c. Inspect end-welded studs (ASTM A-108) installation (including bend test).	Periodic	SI	2213A.2; AISC 360-16 (AISC 341-16 as applicable); AWS D1.1; DSA IR 17-3.
<input type="checkbox"/>	d. Inspect floor and roof deck welds.	Periodic	SI	1705A.2.2, Table 1705A.2.1 Item 5a.6; AISC 360-16 (AISC 341-16 as applicable); AWS D1.3; DSA IR 17-3.
<input type="checkbox"/>	e. Inspect welding of structural cold-formed steel.	Periodic	SI*	1705A.2.5; AWS D1.3; DSA IR 17-3. The quality control provisions of AISI S240-20 Chapter D shall also apply. * May be performed by the project inspector when specifically approved by DSA.
<input type="checkbox"/>	f. Inspect welding of stairs and railing systems.	Periodic	SI*	1705A.2.1; AISC 360-16 (AISC 341-16 as applicable); AWS D1.1 & D1.3; DSA IR 17-3. * May be performed by the project inspector when specifically approved by DSA.
<input type="checkbox"/>	g. Verification of reinforcing steel weldability.	Periodic	SI	1705A.3.1; AWS D1.4; DSA IR 17-3. Verify carbon equivalent reported on mill certificates.
<input type="checkbox"/>	h. Inspect welding of reinforcing steel.	Continuous	SI	Table 1705A.2.1 Item 5b, 1705A.3.1, Table 1705A.3 Item 2, 1903A.8; AWS D1.4; DSA IR 17-3.

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (STEEL AND ALUMNINUM), 2022 CBC

1705A.2.1, Table 1705A.2.1; AISC 303-16, AISC 341-16, AISC 358-16, AISC 360-16; AISI S100-20; RCSC 2014; AWS D1.1, AWS D1.2, AWS D1.3, AWS D1.4, AWS D1.8

Application Number:

02-122128

School Name:

Wanda Hirsch Elementary School

School District:

Tracy Unified School District

DSA File Number:

39-73

Increment Number:

Date Created:

2024-04-11 14:09:51

	Test or Special Inspection	Type	Performed By	Code References and Notes
	S/A6. NONDESTRUCTIVE TESTING:			
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Ultrasonic	Test	LOR	1705A.2.1, 1705A.2.5; AISC 341-16 J6.2, AISC 360-16 N5.5; AWS D1.1, AWS D1.8; DSA IR 17-2.
<input checked="" type="checkbox"/>	b. Magnetic Particle	Test	LOR	1705A.2.1, 1705A.2.5; AISC 341-16 J6.2, AISC 360-16 N5.5; AWS D1.1, AWS D1.8; DSA IR 17-2.
<input type="checkbox"/>	c.	Test	LOR	

	S/A7. STEEL JOISTS AND TRUSSES:			
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Verify size, type and grade for all chord and web members as well as connectors and weld filler material; verify joist profile, dimensions and camber (if applicable); verify all weld locations, lengths and profiles; mark or tag each joist.	Continuous	SI	1705A.2.3, Table 1705A.2.3; AWS D1.1; DSA IR 22-3 for steel joists only. 1705A.2.4; AWS D1.3 for cold-formed steel trusses.

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (STEEL AND ALUMNINUM), 2022 CBC

1705A.2.1, Table 1705A.2.1; AISC 303-16, AISC 341-16, AISC 358-16, AISC 360-16; AISI S100-20; RCSC 2014; AWS D1.1, AWS D1.2, AWS D1.3, AWS D1.4, AWS D1.8

Application Number: 02-122128	School Name: Wanda Hirsch Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-04-11 14:09:51

	Test or Special Inspection	Type	Performed By	Code References and Notes
	S/A8. SPRAYED FIRE-RESISTANT MATERIALS:			
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Examine structural steel surface conditions, inspect application, take samples, measure thickness and verify compliance of all aspects of application with DSA-approved documents.	Periodic	SI	1705A.15, 1705A.15.1, 1705A.15.2, 1705A.15.3, 1705A.15.4, 1705A.15.5, 1705A.15.6.
<input type="checkbox"/>	b. Test density.	Test	LOR	1705A.15.1, 1705A.15.5, ASTM E605
<input type="checkbox"/>	c. Bond strength adhesion/cohesion.	Test	LOR	1705A.15.1, 1705A.15.6, ASTM E736

	S/A9. ANCHOR BOLTS AND ANCHOR RODS:			
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Anchor Bolts and Anchor Rods	Test	LOR	Identify, sample and test anchor bolts and anchor rods not meeting exemptions identified in Section 1 of IR 17-11.
<input type="checkbox"/>	b. Threaded rod not used for foundation anchorage.	Test	LOR	Identify, sample and test threaded rods not meeting exemptions identified in Section 1 of IR 17-11.

	S/A10. STORAGE RACK SYSTEMS:			
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Materials used, to verify compliance with one or more of the material test reports in accordance with the approved construction documents.	Periodic	SI	Table 1705A.13.7
<input type="checkbox"/>	b. Fabricated storage rack elements.	Periodic	SI	1704A.2.5; Table 1705A.13.7

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (STEEL AND ALUMNINUM), 2022 CBC

1705A.2.1, Table 1705A.2.1; AISC 303-16, AISC 341-16, AISC 358-16, AISC 360-16; AISI S100-20; RCSC 2014; AWS D1.1, AWS D1.2, AWS D1.3, AWS D1.4, AWS D1.8

Application Number:

02-122128

School Name:

Wanda Hirsch Elementary School

School District:

Tracy Unified School District

DSA File Number:

39-73

Increment Number:

Date Created:

2024-04-11 14:09:51

	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	c. Storage rack anchorage installation.	Periodic	SI	ANSI/MH16.1 Section 7.3.2; Table 1705A.13.7
<input type="checkbox"/>	d. Completed storage rack system to indicate compliance with the approved construction documents.	Periodic	SI*	Table 1705A.13.7; * May be preformed by the project inspector when specifically approved by DSA.

	S/A11. Other Steel			
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input checked="" type="checkbox"/>	a. Shop welding-inspect welding of cold-formed steel periodic/special inspector	Periodic	SI	
<input checked="" type="checkbox"/>	b. Hollow bolts	Continuous	PI	Verify the torque installation torque

Appendix: Work Exempt from DSA Requirements for Structural Tests / Special Inspections

Application Number: 02-122128	School Name: Wanda Hirsch Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-04-11 14:09:51

Exempt items given in DSA IR A-22 or the 2022 CBC (including DSA amendments) and those items identified below with a check mark by the design professional are NOT subject to DSA requirements for the structural tests / special inspections noted. **Items marked as exempt shall be identified on the approved construction documents.** The project inspector shall verify all construction complies with the approved construction documents.

	SOILS:
<input type="checkbox"/>	1. Deep foundations acting as a cantilever footing with a design based on minimum allowable pressures per CBC Table 1806A.2 and without a geotechnical report for the following cases: A) free standing sign or scoreboard, B) cell or antenna towers and poles less than 35'-0" tall (e.g., lighting poles, flag poles, poles supporting open mesh fences, etc.), C) single-story structure with dead load less than 5 psf (e.g., open fabric shade structure), or D) covered walkway structure with an apex height less than 10'-0" above adjacent grade.
<input type="checkbox"/>	2. Shallow foundations, etc. are exempt from special inspections and testing by a Geotechnical Engineer for the following cases: A) buildings without a geotechnical report and meeting the exception item #1 criteria in CBC Section 1803A.2 supported by native soil (any excavation depth) or fill soil (not exceeding 12" depth per CBC Section 1804A.6), B) soil scarification/recompaction not exceeding 12" depth, C) native or fill soil supporting exterior non-structural flatwork (e.g., sidewalks, site concrete ramps, site stairs, parking lots, driveways, etc.), D) unpaved landscaping and playground areas, or E) utility trench backfill with depth not exceeding 12".

	CONCRETE/MASONRY:
<input type="checkbox"/>	1. Post-installed anchors for the following: A) exempt non-structural components (e.g., mechanical, electrical, plumbing equipment - see item 7 for "Welding" in the Appendix below) given in CBC Section 1617A.1.18 (which replaces ASCE 7-16, Section 13.1.4) or B) interior nonstructural wall partitions meeting criteria listed in exempt item 3 for "Welding" in the Appendix below
<input checked="" type="checkbox"/>	2. Concrete batch plant inspection is not required for items given in CBC Section 1705A.3.3.2 subject to the requirements and limitations in that section.
<input type="checkbox"/>	3. Non-bearing non-shear masonry walls may be exempt from certain DSA masonry testing and special inspection items as allowed per DSA IR 21-1. Refer to construction documents for specific exemptions accordingly for each applicable wall condition shown in Appendix A of IR 21-1.
<input checked="" type="checkbox"/>	4. Epoxy shear dowels in site flatwork and/or other non-structural concrete.

Appendix: Work Exempt from DSA Requirements for Structural Tests / Special Inspections

Application Number: 02-122128	School Name: Wanda Hirsch Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-04-11 14:09:51

	CONCRETE/MASONRY:
<input type="checkbox"/>	5. Testing of reinforcing bars is not required for items given in CBC Section 1910A.2 subject to the requirements and limitations in that section.

	WELDING:
<input type="checkbox"/>	1. Solid-clad and open-mesh fences, gates with maximum leaf span of 10', and gates with a maximum rolling section of 10' all having an apex height less than 8'-0" above lowest adjacent grade. When located above circulation or occupied space below, these gates/fences are not located within 1.5x gate/fence height (max 8'-0") to the edge of floor or roof.
<input type="checkbox"/>	2. Handrails, guardrails, and modular or relocatable ramps associated with walking surfaces less than 30" above adjacent grade (excluding post base connections per the 'Exception' language in Section 1705A.2.1); fillet welds shall not be ground flush.
<input type="checkbox"/>	3. Non-structural interior cold-formed steel framing spanning less than 15'-0", such as in interior partitions, interior soffits, etc. supporting only self weight and light-weight finishes or adhered tile, masonry, stone, or terra cotta veneer no more than 5/8" thickness and apex less than 20'-0" in height and not over an exit way. Maximum tributary load to a member shall not exceed the equivalent of that occurring from a 10'x10' opening in a 15' tall wall for a header or king stud.
<input type="checkbox"/>	4. Manufactured support frames and curbs using hot rolled or cold-formed steel (i.e., light gauge) for mechanical, electrical, or plumbing equipment weighing less than 2000# (equipment only) (connections of such frames to superstructure elements using welding will require special inspection as noted in selected item(s) for Sections S/A3, S/A4 and/or S/A5 of listing above).
<input type="checkbox"/>	5. Manufactured components (e.g., Tolco, B-Line, Afcon, etc.) for mechanical, electrical, or plumbing hanger support and bracing (connections of such components to superstructure elements using welding will require special inspection as noted in selected item(s) for Sections S/A3, S/A4 and/or S/A5 of listing above).
<input type="checkbox"/>	6. TV Brackets, projector mounts with a valid listing (see DSA IR A-5) and recreational equipment (e.g., playground structures, basketball backstops, etc.) (connections of such elements to superstructure elements using welding will require special inspection as noted in selected item(s) for sections S/A3, S/A4 and/or S/A5 located in the Steel/Aluminum category of listing above).

Appendix: Work Exempt from DSA Requirements for Structural Tests / Special Inspections

Application Number: 02-122128	School Name: Wanda Hirsch Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-04-11 14:09:51

	WELDING:
<input type="checkbox"/>	7. Any support for exempt non-structural components given in CBC Section 1617A.1.18 (which replaces ASCE 7-16, Section 13.1.4) meeting the following: A) when supported on a floor/roof, <400# and resulting composite center of mass (including component's center of mass) ≤4' above supporting floor/roof, B) when hung from a wall or roof/floor, <20# for discrete units or <5 plf for distributed systems.

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS(SIGNATURE), 2022 CBC

Application Number:

02-122128

School Name:

Wanda Hirsch Elementary School

School District:

Tracy Unified School District

DSA File Number:

39-73

Increment Number:

Date Created:

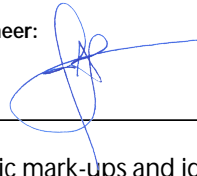
2024-04-11 14:09:51

Name of Architect or Engineer in general responsible charge:

Jeffrey Grau

Name of Structural Engineer (When structural design has been delegated):

Signature of Architect or Structural Engineer:



Date:

04/11/24

Note: To facilitate DSA electronic mark-ups and identification stamp application, DSA recommends against using secured electronic or digital signatures.

DSA STAMP

DSA 103-22: LIST OF REQUIRED VERIFIED REPORTS, CBC 2022

Application Number:

02-122128

DSA File Number:

39-73

School Name:

Wanda Hirsch Elementary School

Increment Number:**School District:**

Tracy Unified School District

Date Created:

2024-04-11 14:09:51

1. Structural Testing and Inspection: Laboratory Verified Report Form DSA 291

2. Shop Welding Inspection: Laboratory Verified Report Form DSA 291, or, for independently contracting SI, Special Inspection Verified Report Form DSA 292

3. Field Welding Inspection: Laboratory Verified Report Form DSA 291, or, for independently contracting SI, Special Inspection Verified Report Form DSA 292

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS, 2022 CBC

General

Application Number: 02-122547	School Name: Art Freiler Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-05-06 21:21:36

IMPORTANT: This form is only a summary list of structural tests and some of the special inspections required for the project. Generally, the structural tests and special inspections noted on this form are those that will be performed by the Geotechnical Engineer of Record, Laboratory of Record, or Special Inspector. The actual complete test and inspection program must be performed as detailed on the DSA approved documents. The appendix at the bottom of this form identifies work NOT subject to DSA requirements for special inspection or structural testing. The project inspector is responsible for providing inspection of all facets of construction, including but not limited to, special inspections not listed on this form such as structural wood framing, high-load wood diaphragms, cold-formed steel framing, anchorage of non-structural components, etc., per Title 24, Part 2, Chapter 17A (2022 CBC).

****NOTE:** Undefined section and table references found in this document are from the CBC, or California Building Code.

KEY TO COLUMNS

1. TYPE	2. PERFORMED BY
Continuous – Indicates that a continuous special inspection is required	GE (Geotechnical Engineer) – Indicates that the special inspection shall be performed by a registered geotechnical engineer or his or her authorized representative.
Periodic – Indicates that a periodic special inspection is required	LOR (Laboratory of Record) – Indicates that the test or special inspection shall be performed by a testing laboratory accepted in the DSA Laboratory Evaluation and Acceptance (LEA) Program. See CAC Section 4-335.
Test – Indicates that a test is required	PI (Project Inspector) – Indicates that the special inspection may be performed by a project inspector when specifically approved by DSA.
	SI (Special Inspection) – Indicates that the special inspection shall be performed by an appropriately qualified/approved special inspector.

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (SOILS), 2022 CBC

Table 1705A.6, Table 1705A.7, Table 1705A.8

Application Number: 02-122547	School Name: Art Freiler Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-05-06 21:21:36

Geotechnical Reports: Project does NOT have and does NOT require a geotechnical report

S1. GENERAL:				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input checked="" type="checkbox"/>	a. Verify that: <ul style="list-style-type: none">• Site has been prepared properly prior to placement of controlled fill and/or excavations for foundations.• Foundation excavations are extended to proper depth and have reached proper material.• Materials below footings must not contain loose material, mud, organic silt, organic clays, or peat.	See Notes	PI	Refer to specific items identified in the Appendix listing exemptions for limitations. Placement of controlled fill exceeding 12" depth under foundations and/or within the building envelope is not permitted without a geotechnical report.

S2. SOIL COMPACTION AND FILL:				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Perform classification and testing of fill materials.	Test	LOR*	* Under the supervision of the geotechnical engineer.
<input checked="" type="checkbox"/>	b. Verify use of proper materials, densities and inspect lift thicknesses, placement and compaction during placement of fill.	Continuous	LOR*	* Under the supervision of a geotechnical engineer or LOR's engineering manager. Refer to specific items identified in the Appendix listing exemptions for limitations.
<input checked="" type="checkbox"/>	c. Compaction testing.	Test	LOR*	* Under the supervision of a geotechnical engineer or LOR's engineering manager. Refer to specific items identified in the Appendix listing exemptions for limitations.

S3. DRIVEN DEEP FOUNDATIONS (PILES):				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Verify pile materials, sizes and lengths comply with the requirements.	Continuous	GE*	* By geotechnical engineer or his or her qualified representative.

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (SOILS), 2022 CBC

Table 1705A.6, Table 1705A.7, Table 1705A.8

Application Number: 02-122547	School Name: Art Freiler Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-05-06 21:21:36

	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	b. Determine capacities of test piles and conduct additional load tests as required.	Test	LOR*	* Under the supervision of the geotechnical engineer.
<input type="checkbox"/>	c. Inspect driving operations and maintain complete and accurate records for each pile.	Continuous	GE*	* By geotechnical engineer or his or her qualified representative.
<input type="checkbox"/>	d. Verify locations of piles and their plumbness, confirm type and size of hammer, record number of blows per foot of penetration, determine required penetrations to achieve design capacity, record tip and butt elevations and record any pile damage.	Continuous	GE*	* By geotechnical engineer or his or her qualified representative.
<input type="checkbox"/>	e. Steel piles.	Provide tests and inspections per STEEL section below.		
<input type="checkbox"/>	f. Concrete piles and concrete filled piles.	Provide tests and inspections per CONCRETE section below.		
<input type="checkbox"/>	g. For specialty piles, perform additional inspections as determined by the registered design professional in responsible charge.	*	*	* As defined on drawings or specifications.

	S4. CAST-IN-PLACE DEEP FOUNDATIONS (PIERS):			
	Test or Special Inspection	Type	Performed By	Code References and Note
<input checked="" type="checkbox"/>	a. Inspect drilling operations and maintain complete and accurate records for each pier.	Continuous	PI	Continuous inspection to be provided by project inspector. Refer to specific items identified in the Appendix listing exemptions for limitations.
<input checked="" type="checkbox"/>	b. Verify pier locations, diameters, plumbness and lengths. Record concrete or grout volumes.	Continuous	PI	Continuous inspection to be provided by project inspector. Refer to specific items identified in the Appendix listing exemptions for limitations.
<input checked="" type="checkbox"/>	c. Concrete piers.	Provide tests and inspections per CONCRETE section below.		

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (SOILS), 2022 CBC

Table 1705A.6, Table 1705A.7, Table 1705A.8

Application Number: 02-122547	School Name: Art Freiler Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-05-06 21:21:36

	Test or Special Inspection	Type	Performed By	Code References and Notes
	S5. RETAINING WALLS:			
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Placement, compaction and inspection of backfill.	Continuous	GE*	1705A.6.1. * By geotechnical engineer or his or her qualified representative. (See section S2 above).
<input type="checkbox"/>	b. Placement of soil reinforcement and/or drainage devices.	Continuous	GE*	* By geotechnical engineer or his or her qualified representative.
<input type="checkbox"/>	c. Segmental retaining walls; inspect placement of units, dowels, connectors, etc.	Continuous	GE*	* By geotechnical engineer or his or her qualified representative. See DSA IR 18-2.
<input type="checkbox"/>	d. Concrete retaining walls.	Provide tests and inspections per CONCRETE section below.		
<input type="checkbox"/>	e. Masonry retaining walls.	Provide tests and inspections per MASONRY section below.		

	S6. OTHER SOILS:			
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Soil Improvements	Test	GE*	Submit a comprehensive report documenting final soil improvements constructed, construction observation and the results of the confirmation testing and analysis to CGS (California Geological Survey) for final acceptance. * By geotechnical engineer or his or her qualified representative.
<input type="checkbox"/>	b. Inspection of Soil Improvements	Continuous	GE*	* By geotechnical engineer or his or her qualified representative.
<input type="checkbox"/>	c.			

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (CONCRETE), 2022 CBC

Table 1705A.3; ACI 318-19 Sections 26.12 & 26.13

Application Number: 02-122547	School Name: Art Freiler Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-05-06 21:21:36

C1. CAST-IN-PLACE CONCRETE				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input checked="" type="checkbox"/>	a. Verify use of required design mix.	Continuous	SI	Table 1705A.3 Item 5, 1910A.1.
<input checked="" type="checkbox"/>	b. Identify, sample, and test reinforcing steel.	Test	LOR	1910A.2; ACI 318-19 Ch.20 and Section 26.6.1.2; DSA IR 17-10. (See Appendix (end of this form) for exemptions.)
<input checked="" type="checkbox"/>	c. During concrete placement, fabricate specimens for strength tests, perform slump and air content tests, and determine the temperature of the concrete.	Test	LOR	Table 1705A.3 Item 6; ACI 318-19 Sections 26.5 & 26.12.
<input checked="" type="checkbox"/>	d. Test concrete (f' _c).	Test	LOR	1905A.1.17; ACI 318-19 Section 26.12.
<input checked="" type="checkbox"/>	e. Batch plant inspection:	See Notes	SI	Default of 'Continuous' per 1705A.3.3. If approved by DSA, batch plant inspection may be reduced to 'Periodic' subject to requirements in Section 1705A.3.3.1, or not required per 1705A.3.3.2. See IR 17-13. (See Appendix (end of this form) for exemptions.)
<input type="checkbox"/>	f. Welding of reinforcing steel.	Provide special inspection per STEEL, Category S/A4(d) & (e) and/or S/A5(g) & (h) below.		

C2. PRESTRESSED / POST-TENSIONED CONCRETE (IN ADDITION TO SECTION C1):				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Sample and test prestressing tendons and anchorages.	Test	LOR	1705A.3.4, 1910A.3
<input type="checkbox"/>	b. Inspect placement of prestressing tendons.	Periodic	SI	1705A.3.4, Table 1705A.3 Items 1 & 9.

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (CONCRETE), 2022 CBC

Table 1705A.3; ACI 318-19 Sections 26.12 & 26.13

Application Number: 02-122547	School Name: Art Freiler Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-05-06 21:21:36

	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	c. Verify in-situ concrete strength prior to stressing of post-tensioning tendons.	Periodic	SI	Table 1705A.3 Item 13. Special inspector to verify specified concrete strength test prior to stressing.
<input type="checkbox"/>	d. Inspect application of post-tensioning or prestressing forces and grouting of bonded prestressing tendons.	Continuous	SI	1705A.3.4, Table 1705A.3 Item 9; ACI 318-19 Section 26.13

	C3. PRECAST CONCRETE (IN ADDITION TO SECTION C1):			
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Inspect fabrication of precast concrete members.	Continuous	SI	ACI 318-19 Section 26.13, and PCI MNL-128 and -130.
<input type="checkbox"/>	b. Inspect erection of precast concrete members.	Periodic	SI*	Table 1705A.3 Item 10. * May be performed by PI when specifically approved by DSA.
<input type="checkbox"/>	c. For precast concrete diaphragm connections or reinforcement at joints classified as moderate or high deformability elements (MDE or HDE) in structures assigned to Seismic Design Category D, E or F, inspect such connections and reinforcement in the field for: 1. Installation of the embedded parts 2. Completion of the continuity of reinforcement across joints. 3. Completion of connections in the field.	Continuous	SI	Table 1705A.3; ACI 318-19 Section 26.13.1.3; ACI 550.5
<input type="checkbox"/>	d. Inspect installation tolerances of precast concrete diaphragm connections for compliance with ACI 550.5.	Periodic	SI	Table 1705A.3; ACI 318-19 Section 26.13.1.3; ACI 550.5

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (CONCRETE), 2022 CBC

Table 1705A.3; ACI 318-19 Sections 26.12 & 26.13

Application Number: 02-122547	School Name: Art Freiler Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-05-06 21:21:36

C4. SHOTCRETE (IN ADDITION TO SECTION C1):				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Inspect shotcrete placement for proper application techniques.	Continuous	SI	1705A.3.9, Table 1705A.3 Item 7, 1908A.1, 1908A.2, 1908A.3. See ACI 506.2-13 Section 3.4, ACI 506R-16.
<input type="checkbox"/>	b. Sample and test shotcrete (f'_c).	Test	LOR	1908A.2, 1705A.3.9

C5. POST-INSTALLED ANCHORS:				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Inspect installation of post-installed anchors	See Notes	SI*	1617A.1.19, Table 1705A.3 Item 4a (Continuous) & 4b (Periodic), 1705A.3.8 (See Appendix (end of this form) for exemptions). ACI 318-19 Section 26.13. * May be performed by the project inspector when specifically approved by DSA.
<input type="checkbox"/>	b. Test post-installed anchors.	Test	LOR	1910A.5. (See Appendix (end of this form) for exemptions.)

C6. OTHER CONCRETE:				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a.			

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (STEEL AND ALUMINUM), 2022 CBC

1705A.2.1, Table 1705A.2.1; AISC 303-16, AISC 341-16, AISC 358-16, AISC 360-16; AISI S100-20; RCSC 2014; AWS D1.1, AWS D1.2, AWS D1.3, AWS D1.4, AWS D1.8

Application Number: 02-122547	School Name: Art Freiler Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-05-06 21:21:36

S/A1. STRUCTURAL STEEL, COLD-FORMED STEEL AND ALUMINUM USED FOR STRUCTURAL PURPOSES				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input checked="" type="checkbox"/>	a. Verify identification of all materials and: • Mill certificates indicate material properties that comply with requirements. • Material sizes, types and grades comply with requirements.	Periodic	*	Table 1705A.2.1 Item 3a 3c. 2202A.1; AISI S100-20 Section A3.1 & A3.2, AISI S240-20 Section A3 & A5, AISI S220-20 Sections A4 & A6. * By special inspector or qualified technician when performed off-site.
<input checked="" type="checkbox"/>	b. Test unidentified materials	Test	LOR	2202A.1.
<input checked="" type="checkbox"/>	c. Examine seam welds of HSS shapes	Periodic	SI	DSA IR 17-3.
<input checked="" type="checkbox"/>	d. Verify and document steel fabrication per DSA-approved construction documents.	Periodic	SI	Not applicable to cold-formed steel light-frame construction, except for trusses (1705A.2.4).
<input type="checkbox"/>	e. Buckling restrained braces.	Test	LOR	Testing and special inspections in accordance with IR 22-4.

S/A2. HIGH-STRENGTH BOLTS:				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input checked="" type="checkbox"/>	a. Verify identification markings and manufacturer's certificates of compliance conform to ASTM standards specified in the DSA-approved documents.	Periodic	SI	Table 1705A.2.1 Items 1a & 1b, 2202A.1; AISC 360-16 Section A3.3, J3.1, and N3.2; RCSC 2014 Section 1.5 & 2.1; DSA IR 17-8 & DSA IR 17-9.
<input checked="" type="checkbox"/>	b. Test high-strength bolts, nuts and washers.	Test	LOR	Table 1705A.2.1 Item 1c, 2213A.1; RCSC 2014 Section 7.2; DSA IR 17-8.
<input checked="" type="checkbox"/>	c. Bearing-type ("snug tight") connections.	Periodic	SI	Table 1705A.2.1 Item 2a, 1705A.2.6, 2204A.2; AISC 360-16 J3.1, J3.2, M2.5 & N5.6; RCSC 2014 Section 9.1; DSA IR 17-9.
<input checked="" type="checkbox"/>	d. Pretensioned and slip-critical connections.	*	SI	Table 1705A.2.1 Items 2b & 2c, 1705A.2.6, 2204A.2; AISC 360-16 J3.1, J3.2, M2.5 & N5.6; RCSC 2014 Sections 9.2 & 9.3; DSA IR 17-9. **"Continuous" or "Periodic" depends on the tightening method used.

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (STEEL AND ALUMNINUM), 2022 CBC

1705A.2.1, Table 1705A.2.1; AISC 303-16, AISC 341-16, AISC 358-16, AISC 360-16; AISI S100-20; RCSC 2014; AWS D1.1, AWS D1.2, AWS D1.3, AWS D1.4, AWS D1.8

Application Number: 02-122547	School Name: Art Freiler Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-05-06 21:21:36

S/A3. WELDING:				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input checked="" type="checkbox"/>	a. Verify weld filler material identification markings per AWS designation listed on the DSA-approved documents and the WPS.	Periodic	SI	1705A.2.5, Table 1705A.2.1 Items 4 & 5; AWS D1.1 and AWS D1.8 for structural steel; AWS D1.2 for Aluminum; AWS D1.3 for cold-formed steel; AWS D1.4 for reinforcing steel; DSA IR 17-3.
<input checked="" type="checkbox"/>	b. Verify weld filler material manufacturer's certificate of compliance.	Periodic	SI	DSA IR 17-3.
<input checked="" type="checkbox"/>	c. Verify WPS, welder qualifications and equipment.	Periodic	SI	DSA IR 17-3.

S/A4. SHOP WELDING (IN ADDITION TO SECTION S/A3):				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input checked="" type="checkbox"/>	a. Inspect groove welds, multi-pass fillet welds, single pass fillet welds > 5/16", plug and slot welds.	Continuous	SI	Table 1705A.2.1 Items 5a.1 4; AISC 360-16 (and AISC 341-16 as applicable); DSA IR 17-3.
<input checked="" type="checkbox"/>	b. Inspect single-pass fillet welds ≤ 5/16", floor and roof deck welds.	Periodic	SI	1705A.2.2, Table 1705A.2.1 Items 5a.5 & 5a.6; AISC 360-16 (and AISC 341-16 as applicable); DSA IR 17-3.
<input type="checkbox"/>	c. Inspect welding of stairs and railing systems.	Periodic	SI	1705A.2.1; AISC 360-16 (and AISC 341-16 as applicable); AWS D1.1 & D1.3; DSA IR 17-3.
<input type="checkbox"/>	d. Verification of reinforcing steel weldability other than ASTM A706.	Periodic	SI	1705A.3.1; AWS D1.4; DSA IR 17-3. Verify carbon equivalent reported on mill certificates.
<input type="checkbox"/>	e. Inspect welding of reinforcing steel.	Continuous	SI	Table 1705A.2.1 Item 5b, 1705A.3.1, Table 1705A.3 Item 2, 1903A.8; AWS D1.4; DSA IR 17-3.

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (STEEL AND ALUMNINUM), 2022 CBC

1705A.2.1, Table 1705A.2.1; AISC 303-16, AISC 341-16, AISC 358-16, AISC 360-16; AISI S100-20; RCSC 2014; AWS D1.1, AWS D1.2, AWS D1.3, AWS D1.4, AWS D1.8

Application Number: 02-122547	School Name: Art Freiler Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-05-06 21:21:36

	Test or Special Inspection	Type	Performed By	Code References and Notes
	S/A5. FIELD WELDING (IN ADDITION TO SECTION S/A3):			
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Inspect groove welds, multi-pass fillet welds, single pass fillet welds > 5/16", plug and slot welds.	Continuous	SI	Table 1705A.2.1 Items 5a.1 4; AISC 360-16 (AISC 341-16 as applicable); DSA IR 17-3.
<input type="checkbox"/>	b. Inspect single-pass fillet welds ≤ 5/16".	Periodic	SI	Table 1705A.2.1 Item 5a.5; AISC 360-16 (AISC 341-16 as applicable); DSA IR 17-3.
<input type="checkbox"/>	c. Inspect end-welded studs (ASTM A-108) installation (including bend test).	Periodic	SI	2213A.2; AISC 360-16 (AISC 341-16 as applicable); AWS D1.1; DSA IR 17-3.
<input type="checkbox"/>	d. Inspect floor and roof deck welds.	Periodic	SI	1705A.2.2, Table 1705A.2.1 Item 5a.6; AISC 360-16 (AISC 341-16 as applicable); AWS D1.3; DSA IR 17-3.
<input type="checkbox"/>	e. Inspect welding of structural cold-formed steel.	Periodic	SI*	1705A.2.5; AWS D1.3; DSA IR 17-3. The quality control provisions of AISI S240-20 Chapter D shall also apply. * May be performed by the project inspector when specifically approved by DSA.
<input type="checkbox"/>	f. Inspect welding of stairs and railing systems.	Periodic	SI*	1705A.2.1; AISC 360-16 (AISC 341-16 as applicable); AWS D1.1 & D1.3; DSA IR 17-3. * May be performed by the project inspector when specifically approved by DSA.
<input type="checkbox"/>	g. Verification of reinforcing steel weldability.	Periodic	SI	1705A.3.1; AWS D1.4; DSA IR 17-3. Verify carbon equivalent reported on mill certificates.
<input type="checkbox"/>	h. Inspect welding of reinforcing steel.	Continuous	SI	Table 1705A.2.1 Item 5b, 1705A.3.1, Table 1705A.3 Item 2, 1903A.8; AWS D1.4; DSA IR 17-3.

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (STEEL AND ALUMNINUM), 2022 CBC

1705A.2.1, Table 1705A.2.1; AISC 303-16, AISC 341-16, AISC 358-16, AISC 360-16; AISI S100-20; RCSC 2014; AWS D1.1, AWS D1.2, AWS D1.3, AWS D1.4, AWS D1.8

Application Number:

02-122547

School Name:

Art Freiler Elementary School

School District:

Tracy Unified School District

DSA File Number:

39-73

Increment Number:

Date Created:

2024-05-06 21:21:36

	Test or Special Inspection	Type	Performed By	Code References and Notes
	S/A6. NONDESTRUCTIVE TESTING:			
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Ultrasonic	Test	LOR	1705A.2.1, 1705A.2.5; AISC 341-16 J6.2, AISC 360-16 N5.5; AWS D1.1, AWS D1.8; DSA IR 17-2.
<input type="checkbox"/>	b. Magnetic Particle	Test	LOR	1705A.2.1, 1705A.2.5; AISC 341-16 J6.2, AISC 360-16 N5.5; AWS D1.1, AWS D1.8; DSA IR 17-2.
<input type="checkbox"/>	c.	Test	LOR	

	S/A7. STEEL JOISTS AND TRUSSES:			
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Verify size, type and grade for all chord and web members as well as connectors and weld filler material; verify joist profile, dimensions and camber (if applicable); verify all weld locations, lengths and profiles; mark or tag each joist.	Continuous	SI	1705A.2.3, Table 1705A.2.3; AWS D1.1; DSA IR 22-3 for steel joists only. 1705A.2.4; AWS D1.3 for cold-formed steel trusses.

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (STEEL AND ALUMNINUM), 2022 CBC

1705A.2.1, Table 1705A.2.1; AISC 303-16, AISC 341-16, AISC 358-16, AISC 360-16; AISI S100-20; RCSC 2014; AWS D1.1, AWS D1.2, AWS D1.3, AWS D1.4, AWS D1.8

Application Number: 02-122547	School Name: Art Freiler Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-05-06 21:21:36

	Test or Special Inspection	Type	Performed By	Code References and Notes
	S/A8. SPRAYED FIRE-RESISTANT MATERIALS:			
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Examine structural steel surface conditions, inspect application, take samples, measure thickness and verify compliance of all aspects of application with DSA-approved documents.	Periodic	SI	1705A.15, 1705A.15.1, 1705A.15.2, 1705A.15.3, 1705A.15.4, 1705A.15.5, 1705A.15.6.
<input type="checkbox"/>	b. Test density.	Test	LOR	1705A.15.1, 1705A.15.5, ASTM E605
<input type="checkbox"/>	c. Bond strength adhesion/cohesion.	Test	LOR	1705A.15.1, 1705A.15.6, ASTM E736

	S/A9. ANCHOR BOLTS AND ANCHOR RODS:			
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Anchor Bolts and Anchor Rods	Test	LOR	Identify, sample and test anchor bolts and anchor rods not meeting exemptions identified in Section 1 of IR 17-11.
<input type="checkbox"/>	b. Threaded rod not used for foundation anchorage.	Test	LOR	Identify, sample and test threaded rods not meeting exemptions identified in Section 1 of IR 17-11.

	S/A10. STORAGE RACK SYSTEMS:			
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Materials used, to verify compliance with one or more of the material test reports in accordance with the approved construction documents.	Periodic	SI	Table 1705A.13.7
<input type="checkbox"/>	b. Fabricated storage rack elements.	Periodic	SI	1704A.2.5; Table 1705A.13.7

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (STEEL AND ALUMNINUM), 2022 CBC

1705A.2.1, Table 1705A.2.1; AISC 303-16, AISC 341-16, AISC 358-16, AISC 360-16; AISI S100-20; RCSC 2014; AWS D1.1, AWS D1.2, AWS D1.3, AWS D1.4, AWS D1.8

Application Number: 02-122547	School Name: Art Freiler Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-05-06 21:21:36

	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	c. Storage rack anchorage installation.	Periodic	SI	ANSI/MH16.1 Section 7.3.2; Table 1705A.13.7
<input type="checkbox"/>	d. Completed storage rack system to indicate compliance with the approved construction documents.	Periodic	SI*	Table 1705A.13.7; * May be preformed by the project inspector when specifically approved by DSA.

	S/A11. Other Steel			
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a.			

Appendix: Work Exempt from DSA Requirements for Structural Tests / Special Inspections

Application Number: 02-122547	School Name: Art Freiler Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-05-06 21:21:36

Exempt items given in DSA IR A-22 or the 2022 CBC (including DSA amendments) and those items identified below with a check mark by the design professional are NOT subject to DSA requirements for the structural tests / special inspections noted. **Items marked as exempt shall be identified on the approved construction documents.** The project inspector shall verify all construction complies with the approved construction documents.

	SOILS:
<input type="checkbox"/>	1. Deep foundations acting as a cantilever footing with a design based on minimum allowable pressures per CBC Table 1806A.2 and without a geotechnical report for the following cases: A) free standing sign or scoreboard, B) cell or antenna towers and poles less than 35'-0" tall (e.g., lighting poles, flag poles, poles supporting open mesh fences, etc.), C) single-story structure with dead load less than 5 psf (e.g., open fabric shade structure), or D) covered walkway structure with an apex height less than 10'-0" above adjacent grade.
<input type="checkbox"/>	2. Shallow foundations, etc. are exempt from special inspections and testing by a Geotechnical Engineer for the following cases: A) buildings without a geotechnical report and meeting the exception item #1 criteria in CBC Section 1803A.2 supported by native soil (any excavation depth) or fill soil (not exceeding 12" depth per CBC Section 1804A.6), B) soil scarification/recompaction not exceeding 12" depth, C) native or fill soil supporting exterior non-structural flatwork (e.g., sidewalks, site concrete ramps, site stairs, parking lots, driveways, etc.), D) unpaved landscaping and playground areas, or E) utility trench backfill with depth not exceeding 12".

	CONCRETE/MASONRY:
<input type="checkbox"/>	1. Post-installed anchors for the following: A) exempt non-structural components (e.g., mechanical, electrical, plumbing equipment - see item 7 for "Welding" in the Appendix below) given in CBC Section 1617A.1.18 (which replaces ASCE 7-16, Section 13.1.4) or B) interior nonstructural wall partitions meeting criteria listed in exempt item 3 for "Welding" in the Appendix below
<input type="checkbox"/>	2. Concrete batch plant inspection is not required for items given in CBC Section 1705A.3.3.2 subject to the requirements and limitations in that section.
<input type="checkbox"/>	3. Non-bearing non-shear masonry walls may be exempt from certain DSA masonry testing and special inspection items as allowed per DSA IR 21-1. Refer to construction documents for specific exemptions accordingly for each applicable wall condition shown in Appendix A of IR 21-1.
<input type="checkbox"/>	4. Epoxy shear dowels in site flatwork and/or other non-structural concrete.

Appendix: Work Exempt from DSA Requirements for Structural Tests / Special Inspections

Application Number: 02-122547	School Name: Art Freiler Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-05-06 21:21:36

	CONCRETE/MASONRY:
<input type="checkbox"/>	5. Testing of reinforcing bars is not required for items given in CBC Section 1910A.2 subject to the requirements and limitations in that section.

	WELDING:
<input type="checkbox"/>	1. Solid-clad and open-mesh fences, gates with maximum leaf span of 10', and gates with a maximum rolling section of 10' all having an apex height less than 8'-0" above lowest adjacent grade. When located above circulation or occupied space below, these gates/fences are not located within 1.5x gate/fence height (max 8'-0") to the edge of floor or roof.
<input type="checkbox"/>	2. Handrails, guardrails, and modular or relocatable ramps associated with walking surfaces less than 30" above adjacent grade (excluding post base connections per the 'Exception' language in Section 1705A.2.1); fillet welds shall not be ground flush.
<input type="checkbox"/>	3. Non-structural interior cold-formed steel framing spanning less than 15'-0", such as in interior partitions, interior soffits, etc. supporting only self weight and light-weight finishes or adhered tile, masonry, stone, or terra cotta veneer no more than 5/8" thickness and apex less than 20'-0" in height and not over an exit way. Maximum tributary load to a member shall not exceed the equivalent of that occurring from a 10'x10' opening in a 15' tall wall for a header or king stud.
<input type="checkbox"/>	4. Manufactured support frames and curbs using hot rolled or cold-formed steel (i.e., light gauge) for mechanical, electrical, or plumbing equipment weighing less than 2000# (equipment only) (connections of such frames to superstructure elements using welding will require special inspection as noted in selected item(s) for Sections S/A3, S/A4 and/or S/A5 of listing above).
<input type="checkbox"/>	5. Manufactured components (e.g., Tolco, B-Line, Afcon, etc.) for mechanical, electrical, or plumbing hanger support and bracing (connections of such components to superstructure elements using welding will require special inspection as noted in selected item(s) for Sections S/A3, S/A4 and/or S/A5 of listing above).
<input type="checkbox"/>	6. TV Brackets, projector mounts with a valid listing (see DSA IR A-5) and recreational equipment (e.g., playground structures, basketball backstops, etc.) (connections of such elements to superstructure elements using welding will require special inspection as noted in selected item(s) for sections S/A3, S/A4 and/or S/A5 located in the Steel/Aluminum category of listing above).

Appendix: Work Exempt from DSA Requirements for Structural Tests / Special Inspections

Application Number: 02-122547	School Name: Art Freiler Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-05-06 21:21:36

	WELDING:
<input type="checkbox"/>	7. Any support for exempt non-structural components given in CBC Section 1617A.1.18 (which replaces ASCE 7-16, Section 13.1.4) meeting the following: A) when supported on a floor/roof, <400# and resulting composite center of mass (including component's center of mass) ≤4' above supporting floor/roof, B) when hung from a wall or roof/floor, <20# for discrete units or <5 plf for distributed systems.

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS(SIGNATURE), 2022 CBC

Application Number:

02-122547

School Name:

Art Freiler Elementary School

School District:

Tracy Unified School District

DSA File Number:

39-73

Increment Number:

Date Created:

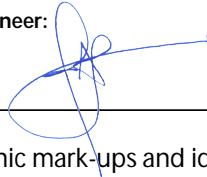
2024-05-06 21:21:36

Name of Architect or Engineer in general responsible charge:

Jeffrey Grau

Name of Structural Engineer (When structural design has been delegated):

Signature of Architect or Structural Engineer:



Date:

05/09/24

Note: To facilitate DSA electronic mark-ups and identification stamp application, DSA recommends against using secured electronic or digital signatures.

DSA STAMP

DSA 103-22: LIST OF REQUIRED VERIFIED REPORTS, CBC 2022

Application Number:

02-122547

DSA File Number:

39-73

School Name:

Art Freiler Elementary School

Increment Number:

School District:

Tracy Unified School District

Date Created:

2024-05-06 21:21:36

1. Structural Testing and Inspection: Laboratory Verified Report Form DSA 291

2. Shop Welding Inspection: Laboratory Verified Report Form DSA 291, or, for independently contracting SI, Special Inspection Verified Report Form DSA 292

3. High-Strength Bolt Installation Inspection: Laboratory Verified Report Form DSA 291, or, for independently contracting SI, Special Inspection Verified Report Form DSA 292

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS, 2022 CBC

General

Application Number: 02-122545	School Name: Jacobson Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-05-06 21:30:48

IMPORTANT: This form is only a summary list of structural tests and some of the special inspections required for the project. Generally, the structural tests and special inspections noted on this form are those that will be performed by the Geotechnical Engineer of Record, Laboratory of Record, or Special Inspector. The actual complete test and inspection program must be performed as detailed on the DSA approved documents. The appendix at the bottom of this form identifies work NOT subject to DSA requirements for special inspection or structural testing. The project inspector is responsible for providing inspection of all facets of construction, including but not limited to, special inspections not listed on this form such as structural wood framing, high-load wood diaphragms, cold-formed steel framing, anchorage of non-structural components, etc., per Title 24, Part 2, Chapter 17A (2022 CBC).

****NOTE:** Undefined section and table references found in this document are from the CBC, or California Building Code.

KEY TO COLUMNS

1. TYPE	2. PERFORMED BY
Continuous – Indicates that a continuous special inspection is required	GE (Geotechnical Engineer) – Indicates that the special inspection shall be performed by a registered geotechnical engineer or his or her authorized representative.
Periodic – Indicates that a periodic special inspection is required	LOR (Laboratory of Record) – Indicates that the test or special inspection shall be performed by a testing laboratory accepted in the DSA Laboratory Evaluation and Acceptance (LEA) Program. See CAC Section 4-335.
Test – Indicates that a test is required	PI (Project Inspector) – Indicates that the special inspection may be performed by a project inspector when specifically approved by DSA.
	SI (Special Inspection) – Indicates that the special inspection shall be performed by an appropriately qualified/approved special inspector.

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (SOILS), 2022 CBC

Table 1705A.6, Table 1705A.7, Table 1705A.8

Application Number: 02-122545	School Name: Jacobson Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-05-06 21:30:48

Geotechnical Reports: Project does NOT have and does NOT require a geotechnical report

S1. GENERAL:				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input checked="" type="checkbox"/>	a. Verify that: <ul style="list-style-type: none">• Site has been prepared properly prior to placement of controlled fill and/or excavations for foundations.• Foundation excavations are extended to proper depth and have reached proper material.• Materials below footings must not contain loose material, mud, organic silt, organic clays, or peat.	See Notes	PI	Refer to specific items identified in the Appendix listing exemptions for limitations. Placement of controlled fill exceeding 12" depth under foundations and/or within the building envelope is not permitted without a geotechnical report.

S2. SOIL COMPACTION AND FILL:				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Perform classification and testing of fill materials.	Test	LOR*	* Under the supervision of the geotechnical engineer.
<input checked="" type="checkbox"/>	b. Verify use of proper materials, densities and inspect lift thicknesses, placement and compaction during placement of fill.	Continuous	LOR*	* Under the supervision of a geotechnical engineer or LOR's engineering manager. Refer to specific items identified in the Appendix listing exemptions for limitations.
<input checked="" type="checkbox"/>	c. Compaction testing.	Test	LOR*	* Under the supervision of a geotechnical engineer or LOR's engineering manager. Refer to specific items identified in the Appendix listing exemptions for limitations.

S3. DRIVEN DEEP FOUNDATIONS (PILES):				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Verify pile materials, sizes and lengths comply with the requirements.	Continuous	GE*	* By geotechnical engineer or his or her qualified representative.

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (SOILS), 2022 CBC

Table 1705A.6, Table 1705A.7, Table 1705A.8

Application Number: 02-122545	School Name: Jacobson Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-05-06 21:30:48

	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	b. Determine capacities of test piles and conduct additional load tests as required.	Test	LOR*	* Under the supervision of the geotechnical engineer.
<input type="checkbox"/>	c. Inspect driving operations and maintain complete and accurate records for each pile.	Continuous	GE*	* By geotechnical engineer or his or her qualified representative.
<input type="checkbox"/>	d. Verify locations of piles and their plumbness, confirm type and size of hammer, record number of blows per foot of penetration, determine required penetrations to achieve design capacity, record tip and butt elevations and record any pile damage.	Continuous	GE*	* By geotechnical engineer or his or her qualified representative.
<input type="checkbox"/>	e. Steel piles.	Provide tests and inspections per STEEL section below.		
<input type="checkbox"/>	f. Concrete piles and concrete filled piles.	Provide tests and inspections per CONCRETE section below.		
<input type="checkbox"/>	g. For specialty piles, perform additional inspections as determined by the registered design professional in responsible charge.	*	*	* As defined on drawings or specifications.

	S4. CAST-IN-PLACE DEEP FOUNDATIONS (PIERS):			
	Test or Special Inspection	Type	Performed By	Code References and Note
<input checked="" type="checkbox"/>	a. Inspect drilling operations and maintain complete and accurate records for each pier.	Continuous	PI	Continuous inspection to be provided by project inspector. Refer to specific items identified in the Appendix listing exemptions for limitations.
<input checked="" type="checkbox"/>	b. Verify pier locations, diameters, plumbness and lengths. Record concrete or grout volumes.	Continuous	PI	Continuous inspection to be provided by project inspector. Refer to specific items identified in the Appendix listing exemptions for limitations.
<input checked="" type="checkbox"/>	c. Concrete piers.	Provide tests and inspections per CONCRETE section below.		

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (SOILS), 2022 CBC

Table 1705A.6, Table 1705A.7, Table 1705A.8

Application Number: 02-122545	School Name: Jacobson Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-05-06 21:30:48

	Test or Special Inspection	Type	Performed By	Code References and Notes
	S5. RETAINING WALLS:			
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Placement, compaction and inspection of backfill.	Continuous	GE*	1705A.6.1. * By geotechnical engineer or his or her qualified representative. (See section S2 above).
<input type="checkbox"/>	b. Placement of soil reinforcement and/or drainage devices.	Continuous	GE*	* By geotechnical engineer or his or her qualified representative.
<input type="checkbox"/>	c. Segmental retaining walls; inspect placement of units, dowels, connectors, etc.	Continuous	GE*	* By geotechnical engineer or his or her qualified representative. See DSA IR 18-2.
<input type="checkbox"/>	d. Concrete retaining walls.	Provide tests and inspections per CONCRETE section below.		
<input type="checkbox"/>	e. Masonry retaining walls.	Provide tests and inspections per MASONRY section below.		

	S6. OTHER SOILS:			
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Soil Improvements	Test	GE*	Submit a comprehensive report documenting final soil improvements constructed, construction observation and the results of the confirmation testing and analysis to CGS (California Geological Survey) for final acceptance. * By geotechnical engineer or his or her qualified representative.
<input type="checkbox"/>	b. Inspection of Soil Improvements	Continuous	GE*	* By geotechnical engineer or his or her qualified representative.
<input type="checkbox"/>	c.			

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (CONCRETE), 2022 CBC

Table 1705A.3; ACI 318-19 Sections 26.12 & 26.13

Application Number: 02-122545	School Name: Jacobson Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-05-06 21:30:48

C1. CAST-IN-PLACE CONCRETE				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input checked="" type="checkbox"/>	a. Verify use of required design mix.	Continuous	SI	Table 1705A.3 Item 5, 1910A.1.
<input checked="" type="checkbox"/>	b. Identify, sample, and test reinforcing steel.	Test	LOR	1910A.2; ACI 318-19 Ch.20 and Section 26.6.1.2; DSA IR 17-10. (See Appendix (end of this form) for exemptions.)
<input checked="" type="checkbox"/>	c. During concrete placement, fabricate specimens for strength tests, perform slump and air content tests, and determine the temperature of the concrete.	Test	LOR	Table 1705A.3 Item 6; ACI 318-19 Sections 26.5 & 26.12.
<input checked="" type="checkbox"/>	d. Test concrete (f'c).	Test	LOR	1905A.1.17; ACI 318-19 Section 26.12.
<input checked="" type="checkbox"/>	e. Batch plant inspection:	See Notes	SI	Default of 'Continuous' per 1705A.3.3. If approved by DSA, batch plant inspection may be reduced to 'Periodic' subject to requirements in Section 1705A.3.3.1, or not required per 1705A.3.3.2. See IR 17-13. (See Appendix (end of this form) for exemptions.)
<input type="checkbox"/>	f. Welding of reinforcing steel.	Provide special inspection per STEEL, Category S/A4(d) & (e) and/or S/A5(g) & (h) below.		

C2. PRESTRESSED / POST-TENSIONED CONCRETE (IN ADDITION TO SECTION C1):				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Sample and test prestressing tendons and anchorages.	Test	LOR	1705A.3.4, 1910A.3
<input type="checkbox"/>	b. Inspect placement of prestressing tendons.	Periodic	SI	1705A.3.4, Table 1705A.3 Items 1 & 9.

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (CONCRETE), 2022 CBC

Table 1705A.3; ACI 318-19 Sections 26.12 & 26.13

Application Number: 02-122545	School Name: Jacobson Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-05-06 21:30:48

	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	c. Verify in-situ concrete strength prior to stressing of post-tensioning tendons.	Periodic	SI	Table 1705A.3 Item 13. Special inspector to verify specified concrete strength test prior to stressing.
<input type="checkbox"/>	d. Inspect application of post-tensioning or prestressing forces and grouting of bonded prestressing tendons.	Continuous	SI	1705A.3.4, Table 1705A.3 Item 9; ACI 318-19 Section 26.13

	C3. PRECAST CONCRETE (IN ADDITION TO SECTION C1):			
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Inspect fabrication of precast concrete members.	Continuous	SI	ACI 318-19 Section 26.13, and PCI MNL-128 and -130.
<input type="checkbox"/>	b. Inspect erection of precast concrete members.	Periodic	SI*	Table 1705A.3 Item 10. * May be performed by PI when specifically approved by DSA.
<input type="checkbox"/>	c. For precast concrete diaphragm connections or reinforcement at joints classified as moderate or high deformability elements (MDE or HDE) in structures assigned to Seismic Design Category D, E or F, inspect such connections and reinforcement in the field for: 1. Installation of the embedded parts 2. Completion of the continuity of reinforcement across joints. 3. Completion of connections in the field.	Continuous	SI	Table 1705A.3; ACI 318-19 Section 26.13.1.3; ACI 550.5
<input type="checkbox"/>	d. Inspect installation tolerances of precast concrete diaphragm connections for compliance with ACI 550.5.	Periodic	SI	Table 1705A.3; ACI 318-19 Section 26.13.1.3; ACI 550.5

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (CONCRETE), 2022 CBC

Table 1705A.3; ACI 318-19 Sections 26.12 & 26.13

Application Number: 02-122545	School Name: Jacobson Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-05-06 21:30:48

C4. SHOTCRETE (IN ADDITION TO SECTION C1):				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Inspect shotcrete placement for proper application techniques.	Continuous	SI	1705A.3.9, Table 1705A.3 Item 7, 1908A.1, 1908A.2, 1908A.3. See ACI 506.2-13 Section 3.4, ACI 506R-16.
<input type="checkbox"/>	b. Sample and test shotcrete (f'_c).	Test	LOR	1908A.2, 1705A.3.9

C5. POST-INSTALLED ANCHORS:				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Inspect installation of post-installed anchors	See Notes	SI*	1617A.1.19, Table 1705A.3 Item 4a (Continuous) & 4b (Periodic), 1705A.3.8 (See Appendix (end of this form) for exemptions). ACI 318-19 Section 26.13. * May be performed by the project inspector when specifically approved by DSA.
<input type="checkbox"/>	b. Test post-installed anchors.	Test	LOR	1910A.5. (See Appendix (end of this form) for exemptions.)

C6. OTHER CONCRETE:				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a.			

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (STEEL AND ALUMINUM), 2022 CBC

1705A.2.1, Table 1705A.2.1; AISC 303-16, AISC 341-16, AISC 358-16, AISC 360-16; AISI S100-20; RCSC 2014; AWS D1.1, AWS D1.2, AWS D1.3, AWS D1.4, AWS D1.8

Application Number: 02-122545	School Name: Jacobson Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-05-06 21:30:48

S/A1. STRUCTURAL STEEL, COLD-FORMED STEEL AND ALUMINUM USED FOR STRUCTURAL PURPOSES				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input checked="" type="checkbox"/>	a. Verify identification of all materials and: • Mill certificates indicate material properties that comply with requirements. • Material sizes, types and grades comply with requirements.	Periodic	*	Table 1705A.2.1 Item 3a 3c. 2202A.1; AISI S100-20 Section A3.1 & A3.2, AISI S240-20 Section A3 & A5, AISI S220-20 Sections A4 & A6. * By special inspector or qualified technician when performed off-site.
<input checked="" type="checkbox"/>	b. Test unidentified materials	Test	LOR	2202A.1.
<input checked="" type="checkbox"/>	c. Examine seam welds of HSS shapes	Periodic	SI	DSA IR 17-3.
<input checked="" type="checkbox"/>	d. Verify and document steel fabrication per DSA-approved construction documents.	Periodic	SI	Not applicable to cold-formed steel light-frame construction, except for trusses (1705A.2.4).
<input type="checkbox"/>	e. Buckling restrained braces.	Test	LOR	Testing and special inspections in accordance with IR 22-4.

S/A2. HIGH-STRENGTH BOLTS:				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input checked="" type="checkbox"/>	a. Verify identification markings and manufacturer's certificates of compliance conform to ASTM standards specified in the DSA-approved documents.	Periodic	SI	Table 1705A.2.1 Items 1a & 1b, 2202A.1; AISC 360-16 Section A3.3, J3.1, and N3.2; RCSC 2014 Section 1.5 & 2.1; DSA IR 17-8 & DSA IR 17-9.
<input checked="" type="checkbox"/>	b. Test high-strength bolts, nuts and washers.	Test	LOR	Table 1705A.2.1 Item 1c, 2213A.1; RCSC 2014 Section 7.2; DSA IR 17-8.
<input checked="" type="checkbox"/>	c. Bearing-type ("snug tight") connections.	Periodic	SI	Table 1705A.2.1 Item 2a, 1705A.2.6, 2204A.2; AISC 360-16 J3.1, J3.2, M2.5 & N5.6; RCSC 2014 Section 9.1; DSA IR 17-9.
<input checked="" type="checkbox"/>	d. Pretensioned and slip-critical connections.	*	SI	Table 1705A.2.1 Items 2b & 2c, 1705A.2.6, 2204A.2; AISC 360-16 J3.1, J3.2, M2.5 & N5.6; RCSC 2014 Sections 9.2 & 9.3; DSA IR 17-9. **"Continuous" or "Periodic" depends on the tightening method used.

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (STEEL AND ALUMNINUM), 2022 CBC

1705A.2.1, Table 1705A.2.1; AISC 303-16, AISC 341-16, AISC 358-16, AISC 360-16; AISI S100-20; RCSC 2014; AWS D1.1, AWS D1.2, AWS D1.3, AWS D1.4, AWS D1.8

Application Number: 02-122545	School Name: Jacobson Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-05-06 21:30:48

S/A3. WELDING:				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input checked="" type="checkbox"/>	a. Verify weld filler material identification markings per AWS designation listed on the DSA-approved documents and the WPS.	Periodic	SI	1705A.2.5, Table 1705A.2.1 Items 4 & 5; AWS D1.1 and AWS D1.8 for structural steel; AWS D1.2 for Aluminum; AWS D1.3 for cold-formed steel; AWS D1.4 for reinforcing steel; DSA IR 17-3.
<input checked="" type="checkbox"/>	b. Verify weld filler material manufacturer's certificate of compliance.	Periodic	SI	DSA IR 17-3.
<input checked="" type="checkbox"/>	c. Verify WPS, welder qualifications and equipment.	Periodic	SI	DSA IR 17-3.

S/A4. SHOP WELDING (IN ADDITION TO SECTION S/A3):				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input checked="" type="checkbox"/>	a. Inspect groove welds, multi-pass fillet welds, single pass fillet welds > 5/16", plug and slot welds.	Continuous	SI	Table 1705A.2.1 Items 5a.1 4; AISC 360-16 (and AISC 341-16 as applicable); DSA IR 17-3.
<input checked="" type="checkbox"/>	b. Inspect single-pass fillet welds ≤ 5/16", floor and roof deck welds.	Periodic	SI	1705A.2.2, Table 1705A.2.1 Items 5a.5 & 5a.6; AISC 360-16 (and AISC 341-16 as applicable); DSA IR 17-3.
<input type="checkbox"/>	c. Inspect welding of stairs and railing systems.	Periodic	SI	1705A.2.1; AISC 360-16 (and AISC 341-16 as applicable); AWS D1.1 & D1.3; DSA IR 17-3.
<input type="checkbox"/>	d. Verification of reinforcing steel weldability other than ASTM A706.	Periodic	SI	1705A.3.1; AWS D1.4; DSA IR 17-3. Verify carbon equivalent reported on mill certificates.
<input type="checkbox"/>	e. Inspect welding of reinforcing steel.	Continuous	SI	Table 1705A.2.1 Item 5b, 1705A.3.1, Table 1705A.3 Item 2, 1903A.8; AWS D1.4; DSA IR 17-3.

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (STEEL AND ALUMNINUM), 2022 CBC

1705A.2.1, Table 1705A.2.1; AISC 303-16, AISC 341-16, AISC 358-16, AISC 360-16; AISI S100-20; RCSC 2014; AWS D1.1, AWS D1.2, AWS D1.3, AWS D1.4, AWS D1.8

Application Number: 02-122545	School Name: Jacobson Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-05-06 21:30:48

	Test or Special Inspection	Type	Performed By	Code References and Notes
	S/A5. FIELD WELDING (IN ADDITION TO SECTION S/A3):			
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Inspect groove welds, multi-pass fillet welds, single pass fillet welds > 5/16", plug and slot welds.	Continuous	SI	Table 1705A.2.1 Items 5a.1 4; AISC 360-16 (AISC 341-16 as applicable); DSA IR 17-3.
<input type="checkbox"/>	b. Inspect single-pass fillet welds ≤ 5/16".	Periodic	SI	Table 1705A.2.1 Item 5a.5; AISC 360-16 (AISC 341-16 as applicable); DSA IR 17-3.
<input type="checkbox"/>	c. Inspect end-welded studs (ASTM A-108) installation (including bend test).	Periodic	SI	2213A.2; AISC 360-16 (AISC 341-16 as applicable); AWS D1.1; DSA IR 17-3.
<input type="checkbox"/>	d. Inspect floor and roof deck welds.	Periodic	SI	1705A.2.2, Table 1705A.2.1 Item 5a.6; AISC 360-16 (AISC 341-16 as applicable); AWS D1.3; DSA IR 17-3.
<input type="checkbox"/>	e. Inspect welding of structural cold-formed steel.	Periodic	SI*	1705A.2.5; AWS D1.3; DSA IR 17-3. The quality control provisions of AISI S240-20 Chapter D shall also apply. * May be performed by the project inspector when specifically approved by DSA.
<input type="checkbox"/>	f. Inspect welding of stairs and railing systems.	Periodic	SI*	1705A.2.1; AISC 360-16 (AISC 341-16 as applicable); AWS D1.1 & D1.3; DSA IR 17-3. * May be performed by the project inspector when specifically approved by DSA.
<input type="checkbox"/>	g. Verification of reinforcing steel weldability.	Periodic	SI	1705A.3.1; AWS D1.4; DSA IR 17-3. Verify carbon equivalent reported on mill certificates.
<input type="checkbox"/>	h. Inspect welding of reinforcing steel.	Continuous	SI	Table 1705A.2.1 Item 5b, 1705A.3.1, Table 1705A.3 Item 2, 1903A.8; AWS D1.4; DSA IR 17-3.

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (STEEL AND ALUMNINUM), 2022 CBC

1705A.2.1, Table 1705A.2.1; AISC 303-16, AISC 341-16, AISC 358-16, AISC 360-16; AISI S100-20; RCSC 2014; AWS D1.1, AWS D1.2, AWS D1.3, AWS D1.4, AWS D1.8

Application Number:

02-122545

School Name:

Jacobson Elementary School

School District:

Tracy Unified School District

DSA File Number:

39-73

Increment Number:

Date Created:

2024-05-06 21:30:48

	Test or Special Inspection	Type	Performed By	Code References and Notes
	S/A6. NONDESTRUCTIVE TESTING:			
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Ultrasonic	Test	LOR	1705A.2.1, 1705A.2.5; AISC 341-16 J6.2, AISC 360-16 N5.5; AWS D1.1, AWS D1.8; DSA IR 17-2.
<input type="checkbox"/>	b. Magnetic Particle	Test	LOR	1705A.2.1, 1705A.2.5; AISC 341-16 J6.2, AISC 360-16 N5.5; AWS D1.1, AWS D1.8; DSA IR 17-2.
<input type="checkbox"/>	c.	Test	LOR	

	S/A7. STEEL JOISTS AND TRUSSES:			
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Verify size, type and grade for all chord and web members as well as connectors and weld filler material; verify joist profile, dimensions and camber (if applicable); verify all weld locations, lengths and profiles; mark or tag each joist.	Continuous	SI	1705A.2.3, Table 1705A.2.3; AWS D1.1; DSA IR 22-3 for steel joists only. 1705A.2.4; AWS D1.3 for cold-formed steel trusses.

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (STEEL AND ALUMNINUM), 2022 CBC

1705A.2.1, Table 1705A.2.1; AISC 303-16, AISC 341-16, AISC 358-16, AISC 360-16; AISI S100-20; RCSC 2014; AWS D1.1, AWS D1.2, AWS D1.3, AWS D1.4, AWS D1.8

Application Number: 02-122545	School Name: Jacobson Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-05-06 21:30:48

	Test or Special Inspection	Type	Performed By	Code References and Notes
	S/A8. SPRAYED FIRE-RESISTANT MATERIALS:			
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Examine structural steel surface conditions, inspect application, take samples, measure thickness and verify compliance of all aspects of application with DSA-approved documents.	Periodic	SI	1705A.15, 1705A.15.1, 1705A.15.2, 1705A.15.3, 1705A.15.4, 1705A.15.5, 1705A.15.6.
<input type="checkbox"/>	b. Test density.	Test	LOR	1705A.15.1, 1705A.15.5, ASTM E605
<input type="checkbox"/>	c. Bond strength adhesion/cohesion.	Test	LOR	1705A.15.1, 1705A.15.6, ASTM E736

	S/A9. ANCHOR BOLTS AND ANCHOR RODS:			
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Anchor Bolts and Anchor Rods	Test	LOR	Identify, sample and test anchor bolts and anchor rods not meeting exemptions identified in Section 1 of IR 17-11.
<input type="checkbox"/>	b. Threaded rod not used for foundation anchorage.	Test	LOR	Identify, sample and test threaded rods not meeting exemptions identified in Section 1 of IR 17-11.

	S/A10. STORAGE RACK SYSTEMS:			
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Materials used, to verify compliance with one or more of the material test reports in accordance with the approved construction documents.	Periodic	SI	Table 1705A.13.7
<input type="checkbox"/>	b. Fabricated storage rack elements.	Periodic	SI	1704A.2.5; Table 1705A.13.7

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (STEEL AND ALUMNINUM), 2022 CBC

1705A.2.1, Table 1705A.2.1; AISC 303-16, AISC 341-16, AISC 358-16, AISC 360-16; AISI S100-20; RCSC 2014; AWS D1.1, AWS D1.2, AWS D1.3, AWS D1.4, AWS D1.8

Application Number:

02-122545

School Name:

Jacobson Elementary School

School District:

Tracy Unified School District

DSA File Number:

39-73

Increment Number:

Date Created:

2024-05-06 21:30:48

	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	c. Storage rack anchorage installation.	Periodic	SI	ANSI/MH16.1 Section 7.3.2; Table 1705A.13.7
<input type="checkbox"/>	d. Completed storage rack system to indicate compliance with the approved construction documents.	Periodic	SI*	Table 1705A.13.7; * May be preformed by the project inspector when specifically approved by DSA.

	S/A11. Other Steel			
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a.			

Appendix: Work Exempt from DSA Requirements for Structural Tests / Special Inspections

Application Number: 02-122545	School Name: Jacobson Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-05-06 21:30:48

Exempt items given in DSA IR A-22 or the 2022 CBC (including DSA amendments) and those items identified below with a check mark by the design professional are NOT subject to DSA requirements for the structural tests / special inspections noted. **Items marked as exempt shall be identified on the approved construction documents.** The project inspector shall verify all construction complies with the approved construction documents.

	SOILS:
<input type="checkbox"/>	1. Deep foundations acting as a cantilever footing with a design based on minimum allowable pressures per CBC Table 1806A.2 and without a geotechnical report for the following cases: A) free standing sign or scoreboard, B) cell or antenna towers and poles less than 35'-0" tall (e.g., lighting poles, flag poles, poles supporting open mesh fences, etc.), C) single-story structure with dead load less than 5 psf (e.g., open fabric shade structure), or D) covered walkway structure with an apex height less than 10'-0" above adjacent grade.
<input type="checkbox"/>	2. Shallow foundations, etc. are exempt from special inspections and testing by a Geotechnical Engineer for the following cases: A) buildings without a geotechnical report and meeting the exception item #1 criteria in CBC Section 1803A.2 supported by native soil (any excavation depth) or fill soil (not exceeding 12" depth per CBC Section 1804A.6), B) soil scarification/recompaction not exceeding 12" depth, C) native or fill soil supporting exterior non-structural flatwork (e.g., sidewalks, site concrete ramps, site stairs, parking lots, driveways, etc.), D) unpaved landscaping and playground areas, or E) utility trench backfill with depth not exceeding 12".

	CONCRETE/MASONRY:
<input type="checkbox"/>	1. Post-installed anchors for the following: A) exempt non-structural components (e.g., mechanical, electrical, plumbing equipment - see item 7 for "Welding" in the Appendix below) given in CBC Section 1617A.1.18 (which replaces ASCE 7-16, Section 13.1.4) or B) interior nonstructural wall partitions meeting criteria listed in exempt item 3 for "Welding" in the Appendix below
<input type="checkbox"/>	2. Concrete batch plant inspection is not required for items given in CBC Section 1705A.3.3.2 subject to the requirements and limitations in that section.
<input type="checkbox"/>	3. Non-bearing non-shear masonry walls may be exempt from certain DSA masonry testing and special inspection items as allowed per DSA IR 21-1. Refer to construction documents for specific exemptions accordingly for each applicable wall condition shown in Appendix A of IR 21-1.
<input type="checkbox"/>	4. Epoxy shear dowels in site flatwork and/or other non-structural concrete.

Appendix: Work Exempt from DSA Requirements for Structural Tests / Special Inspections

Application Number: 02-122545	School Name: Jacobson Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-05-06 21:30:48

	CONCRETE/MASONRY:
<input type="checkbox"/>	5. Testing of reinforcing bars is not required for items given in CBC Section 1910A.2 subject to the requirements and limitations in that section.

	WELDING:
<input type="checkbox"/>	1. Solid-clad and open-mesh fences, gates with maximum leaf span of 10', and gates with a maximum rolling section of 10' all having an apex height less than 8'-0" above lowest adjacent grade. When located above circulation or occupied space below, these gates/fences are not located within 1.5x gate/fence height (max 8'-0") to the edge of floor or roof.
<input type="checkbox"/>	2. Handrails, guardrails, and modular or relocatable ramps associated with walking surfaces less than 30" above adjacent grade (excluding post base connections per the 'Exception' language in Section 1705A.2.1); fillet welds shall not be ground flush.
<input type="checkbox"/>	3. Non-structural interior cold-formed steel framing spanning less than 15'-0", such as in interior partitions, interior soffits, etc. supporting only self weight and light-weight finishes or adhered tile, masonry, stone, or terra cotta veneer no more than 5/8" thickness and apex less than 20'-0" in height and not over an exit way. Maximum tributary load to a member shall not exceed the equivalent of that occurring from a 10'x10' opening in a 15' tall wall for a header or king stud.
<input type="checkbox"/>	4. Manufactured support frames and curbs using hot rolled or cold-formed steel (i.e., light gauge) for mechanical, electrical, or plumbing equipment weighing less than 2000# (equipment only) (connections of such frames to superstructure elements using welding will require special inspection as noted in selected item(s) for Sections S/A3, S/A4 and/or S/A5 of listing above).
<input type="checkbox"/>	5. Manufactured components (e.g., Tolco, B-Line, Afcon, etc.) for mechanical, electrical, or plumbing hanger support and bracing (connections of such components to superstructure elements using welding will require special inspection as noted in selected item(s) for Sections S/A3, S/A4 and/or S/A5 of listing above).
<input type="checkbox"/>	6. TV Brackets, projector mounts with a valid listing (see DSA IR A-5) and recreational equipment (e.g., playground structures, basketball backstops, etc.) (connections of such elements to superstructure elements using welding will require special inspection as noted in selected item(s) for sections S/A3, S/A4 and/or S/A5 located in the Steel/Aluminum category of listing above).

Appendix: Work Exempt from DSA Requirements for Structural Tests / Special Inspections

Application Number: 02-122545	School Name: Jacobson Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-05-06 21:30:48

	WELDING:
<input type="checkbox"/>	7. Any support for exempt non-structural components given in CBC Section 1617A.1.18 (which replaces ASCE 7-16, Section 13.1.4) meeting the following: A) when supported on a floor/roof, <400# and resulting composite center of mass (including component's center of mass) ≤4' above supporting floor/roof, B) when hung from a wall or roof/floor, <20# for discrete units or <5 plf for distributed systems.

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS(SIGNATURE), 2022 CBC

Application Number:

02-122545

School Name:

Jacobson Elementary School

School District:

Tracy Unified School District

DSA File Number:

39-73

Increment Number:

Date Created:

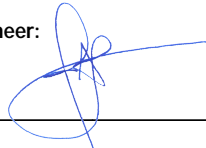
2024-05-06 21:30:48

Name of Architect or Engineer in general responsible charge:

Jeffrey Grau

Name of Structural Engineer (When structural design has been delegated):

Signature of Architect or Structural Engineer:



Date:

05/09/24

Note: To facilitate DSA electronic mark-ups and identification stamp application, DSA recommends against using secured electronic or digital signatures.

DSA STAMP

DSA 103-22: LIST OF REQUIRED VERIFIED REPORTS, CBC 2022

Application Number: 02-122545	School Name: Jacobson Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-05-06 21:30:48

1. Structural Testing and Inspection: Laboratory Verified Report Form DSA 291

2. Shop Welding Inspection: Laboratory Verified Report Form DSA 291, or, for independently contracting SI, Special Inspection Verified Report Form DSA 292

3. High-Strength Bolt Installation Inspection: Laboratory Verified Report Form DSA 291, or, for independently contracting SI, Special Inspection Verified Report Form DSA 292

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS, 2022 CBC

General

Application Number: 02-122548	School Name: George Kelly Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-05-06 21:26:32

IMPORTANT: This form is only a summary list of structural tests and some of the special inspections required for the project. Generally, the structural tests and special inspections noted on this form are those that will be performed by the Geotechnical Engineer of Record, Laboratory of Record, or Special Inspector. The actual complete test and inspection program must be performed as detailed on the DSA approved documents. The appendix at the bottom of this form identifies work NOT subject to DSA requirements for special inspection or structural testing. The project inspector is responsible for providing inspection of all facets of construction, including but not limited to, special inspections not listed on this form such as structural wood framing, high-load wood diaphragms, cold-formed steel framing, anchorage of non-structural components, etc., per Title 24, Part 2, Chapter 17A (2022 CBC).

****NOTE:** Undefined section and table references found in this document are from the CBC, or California Building Code.

KEY TO COLUMNS

1. TYPE	2. PERFORMED BY
Continuous – Indicates that a continuous special inspection is required	GE (Geotechnical Engineer) – Indicates that the special inspection shall be performed by a registered geotechnical engineer or his or her authorized representative.
Periodic – Indicates that a periodic special inspection is required	LOR (Laboratory of Record) – Indicates that the test or special inspection shall be performed by a testing laboratory accepted in the DSA Laboratory Evaluation and Acceptance (LEA) Program. See CAC Section 4-335.
Test – Indicates that a test is required	PI (Project Inspector) – Indicates that the special inspection may be performed by a project inspector when specifically approved by DSA.
	SI (Special Inspection) – Indicates that the special inspection shall be performed by an appropriately qualified/approved special inspector.

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (SOILS), 2022 CBC

Table 1705A.6, Table 1705A.7, Table 1705A.8

Application Number: 02-122548	School Name: George Kelly Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-05-06 21:26:32

Geotechnical Reports: Project does NOT have and does NOT require a geotechnical report

S1. GENERAL:				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input checked="" type="checkbox"/>	a. Verify that: <ul style="list-style-type: none">• Site has been prepared properly prior to placement of controlled fill and/or excavations for foundations.• Foundation excavations are extended to proper depth and have reached proper material.• Materials below footings must not contain loose material, mud, organic silt, organic clays, or peat.	See Notes	PI	Refer to specific items identified in the Appendix listing exemptions for limitations. Placement of controlled fill exceeding 12" depth under foundations and/or within the building envelope is not permitted without a geotechnical report.

S2. SOIL COMPACTION AND FILL:				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Perform classification and testing of fill materials.	Test	LOR*	* Under the supervision of the geotechnical engineer.
<input checked="" type="checkbox"/>	b. Verify use of proper materials, densities and inspect lift thicknesses, placement and compaction during placement of fill.	Continuous	LOR*	* Under the supervision of a geotechnical engineer or LOR's engineering manager. Refer to specific items identified in the Appendix listing exemptions for limitations.
<input checked="" type="checkbox"/>	c. Compaction testing.	Test	LOR*	* Under the supervision of a geotechnical engineer or LOR's engineering manager. Refer to specific items identified in the Appendix listing exemptions for limitations.

S3. DRIVEN DEEP FOUNDATIONS (PILES):				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Verify pile materials, sizes and lengths comply with the requirements.	Continuous	GE*	* By geotechnical engineer or his or her qualified representative.

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (SOILS), 2022 CBC

Table 1705A.6, Table 1705A.7, Table 1705A.8

Application Number: 02-122548	School Name: George Kelly Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-05-06 21:26:32

	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	b. Determine capacities of test piles and conduct additional load tests as required.	Test	LOR*	* Under the supervision of the geotechnical engineer.
<input type="checkbox"/>	c. Inspect driving operations and maintain complete and accurate records for each pile.	Continuous	GE*	* By geotechnical engineer or his or her qualified representative.
<input type="checkbox"/>	d. Verify locations of piles and their plumbness, confirm type and size of hammer, record number of blows per foot of penetration, determine required penetrations to achieve design capacity, record tip and butt elevations and record any pile damage.	Continuous	GE*	* By geotechnical engineer or his or her qualified representative.
<input type="checkbox"/>	e. Steel piles.	Provide tests and inspections per STEEL section below.		
<input type="checkbox"/>	f. Concrete piles and concrete filled piles.	Provide tests and inspections per CONCRETE section below.		
<input type="checkbox"/>	g. For specialty piles, perform additional inspections as determined by the registered design professional in responsible charge.	*	*	* As defined on drawings or specifications.

	S4. CAST-IN-PLACE DEEP FOUNDATIONS (PIERS):			
	Test or Special Inspection	Type	Performed By	Code References and Note
<input checked="" type="checkbox"/>	a. Inspect drilling operations and maintain complete and accurate records for each pier.	Continuous	PI	Continuous inspection to be provided by project inspector. Refer to specific items identified in the Appendix listing exemptions for limitations.
<input checked="" type="checkbox"/>	b. Verify pier locations, diameters, plumbness and lengths. Record concrete or grout volumes.	Continuous	PI	Continuous inspection to be provided by project inspector. Refer to specific items identified in the Appendix listing exemptions for limitations.
<input checked="" type="checkbox"/>	c. Concrete piers.	Provide tests and inspections per CONCRETE section below.		

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (SOILS), 2022 CBC

Table 1705A.6, Table 1705A.7, Table 1705A.8

Application Number: 02-122548	School Name: George Kelly Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-05-06 21:26:32

	Test or Special Inspection	Type	Performed By	Code References and Notes
	S5. RETAINING WALLS:			
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Placement, compaction and inspection of backfill.	Continuous	GE*	1705A.6.1. * By geotechnical engineer or his or her qualified representative. (See section S2 above).
<input type="checkbox"/>	b. Placement of soil reinforcement and/or drainage devices.	Continuous	GE*	* By geotechnical engineer or his or her qualified representative.
<input type="checkbox"/>	c. Segmental retaining walls; inspect placement of units, dowels, connectors, etc.	Continuous	GE*	* By geotechnical engineer or his or her qualified representative. See DSA IR 18-2.
<input type="checkbox"/>	d. Concrete retaining walls.	Provide tests and inspections per CONCRETE section below.		
<input type="checkbox"/>	e. Masonry retaining walls.	Provide tests and inspections per MASONRY section below.		

	S6. OTHER SOILS:			
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Soil Improvements	Test	GE*	Submit a comprehensive report documenting final soil improvements constructed, construction observation and the results of the confirmation testing and analysis to CGS (California Geological Survey) for final acceptance. * By geotechnical engineer or his or her qualified representative.
<input type="checkbox"/>	b. Inspection of Soil Improvements	Continuous	GE*	* By geotechnical engineer or his or her qualified representative.
<input type="checkbox"/>	c.			

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (CONCRETE), 2022 CBC

Table 1705A.3; ACI 318-19 Sections 26.12 & 26.13

Application Number: 02-122548	School Name: George Kelly Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-05-06 21:26:32

C1. CAST-IN-PLACE CONCRETE				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input checked="" type="checkbox"/>	a. Verify use of required design mix.	Continuous	SI	Table 1705A.3 Item 5, 1910A.1.
<input checked="" type="checkbox"/>	b. Identify, sample, and test reinforcing steel.	Test	LOR	1910A.2; ACI 318-19 Ch.20 and Section 26.6.1.2; DSA IR 17-10. (See Appendix (end of this form) for exemptions.)
<input checked="" type="checkbox"/>	c. During concrete placement, fabricate specimens for strength tests, perform slump and air content tests, and determine the temperature of the concrete.	Test	LOR	Table 1705A.3 Item 6; ACI 318-19 Sections 26.5 & 26.12.
<input checked="" type="checkbox"/>	d. Test concrete (f'c).	Test	LOR	1905A.1.17; ACI 318-19 Section 26.12.
<input checked="" type="checkbox"/>	e. Batch plant inspection:	See Notes	SI	Default of 'Continuous' per 1705A.3.3. If approved by DSA, batch plant inspection may be reduced to 'Periodic' subject to requirements in Section 1705A.3.3.1, or not required per 1705A.3.3.2. See IR 17-13. (See Appendix (end of this form) for exemptions.)
<input type="checkbox"/>	f. Welding of reinforcing steel.	Provide special inspection per STEEL, Category S/A4(d) & (e) and/or S/A5(g) & (h) below.		

C2. PRESTRESSED / POST-TENSIONED CONCRETE (IN ADDITION TO SECTION C1):				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Sample and test prestressing tendons and anchorages.	Test	LOR	1705A.3.4, 1910A.3
<input type="checkbox"/>	b. Inspect placement of prestressing tendons.	Periodic	SI	1705A.3.4, Table 1705A.3 Items 1 & 9.

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (CONCRETE), 2022 CBC

Table 1705A.3; ACI 318-19 Sections 26.12 & 26.13

Application Number: 02-122548	School Name: George Kelly Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-05-06 21:26:32

	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	c. Verify in-situ concrete strength prior to stressing of post-tensioning tendons.	Periodic	SI	Table 1705A.3 Item 13. Special inspector to verify specified concrete strength test prior to stressing.
<input type="checkbox"/>	d. Inspect application of post-tensioning or prestressing forces and grouting of bonded prestressing tendons.	Continuous	SI	1705A.3.4, Table 1705A.3 Item 9; ACI 318-19 Section 26.13

	C3. PRECAST CONCRETE (IN ADDITION TO SECTION C1):			
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Inspect fabrication of precast concrete members.	Continuous	SI	ACI 318-19 Section 26.13, and PCI MNL-128 and -130.
<input type="checkbox"/>	b. Inspect erection of precast concrete members.	Periodic	SI*	Table 1705A.3 Item 10. * May be performed by PI when specifically approved by DSA.
<input type="checkbox"/>	c. For precast concrete diaphragm connections or reinforcement at joints classified as moderate or high deformability elements (MDE or HDE) in structures assigned to Seismic Design Category D, E or F, inspect such connections and reinforcement in the field for: 1. Installation of the embedded parts 2. Completion of the continuity of reinforcement across joints. 3. Completion of connections in the field.	Continuous	SI	Table 1705A.3; ACI 318-19 Section 26.13.1.3; ACI 550.5
<input type="checkbox"/>	d. Inspect installation tolerances of precast concrete diaphragm connections for compliance with ACI 550.5.	Periodic	SI	Table 1705A.3; ACI 318-19 Section 26.13.1.3; ACI 550.5

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (CONCRETE), 2022 CBC

Table 1705A.3; ACI 318-19 Sections 26.12 & 26.13

Application Number: 02-122548	School Name: George Kelly Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-05-06 21:26:32

C4. SHOTCRETE (IN ADDITION TO SECTION C1):				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Inspect shotcrete placement for proper application techniques.	Continuous	SI	1705A.3.9, Table 1705A.3 Item 7, 1908A.1, 1908A.2, 1908A.3. See ACI 506.2-13 Section 3.4, ACI 506R-16.
<input type="checkbox"/>	b. Sample and test shotcrete (f'_c).	Test	LOR	1908A.2, 1705A.3.9

C5. POST-INSTALLED ANCHORS:				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Inspect installation of post-installed anchors	See Notes	SI*	1617A.1.19, Table 1705A.3 Item 4a (Continuous) & 4b (Periodic), 1705A.3.8 (See Appendix (end of this form) for exemptions). ACI 318-19 Section 26.13. * May be performed by the project inspector when specifically approved by DSA.
<input type="checkbox"/>	b. Test post-installed anchors.	Test	LOR	1910A.5. (See Appendix (end of this form) for exemptions.)

C6. OTHER CONCRETE:				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a.			

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (STEEL AND ALUMINUM), 2022 CBC

1705A.2.1, Table 1705A.2.1; AISC 303-16, AISC 341-16, AISC 358-16, AISC 360-16; AISI S100-20; RCSC 2014; AWS D1.1, AWS D1.2, AWS D1.3, AWS D1.4, AWS D1.8

Application Number: 02-122548	School Name: George Kelly Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-05-06 21:26:32

S/A1. STRUCTURAL STEEL, COLD-FORMED STEEL AND ALUMINUM USED FOR STRUCTURAL PURPOSES				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input checked="" type="checkbox"/>	a. Verify identification of all materials and: • Mill certificates indicate material properties that comply with requirements. • Material sizes, types and grades comply with requirements.	Periodic	*	Table 1705A.2.1 Item 3a 3c. 2202A.1; AISI S100-20 Section A3.1 & A3.2, AISI S240-20 Section A3 & A5, AISI S220-20 Sections A4 & A6. * By special inspector or qualified technician when performed off-site.
<input checked="" type="checkbox"/>	b. Test unidentified materials	Test	LOR	2202A.1.
<input checked="" type="checkbox"/>	c. Examine seam welds of HSS shapes	Periodic	SI	DSA IR 17-3.
<input checked="" type="checkbox"/>	d. Verify and document steel fabrication per DSA-approved construction documents.	Periodic	SI	Not applicable to cold-formed steel light-frame construction, except for trusses (1705A.2.4).
<input type="checkbox"/>	e. Buckling restrained braces.	Test	LOR	Testing and special inspections in accordance with IR 22-4.

S/A2. HIGH-STRENGTH BOLTS:				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input checked="" type="checkbox"/>	a. Verify identification markings and manufacturer's certificates of compliance conform to ASTM standards specified in the DSA-approved documents.	Periodic	SI	Table 1705A.2.1 Items 1a & 1b, 2202A.1; AISC 360-16 Section A3.3, J3.1, and N3.2; RCSC 2014 Section 1.5 & 2.1; DSA IR 17-8 & DSA IR 17-9.
<input checked="" type="checkbox"/>	b. Test high-strength bolts, nuts and washers.	Test	LOR	Table 1705A.2.1 Item 1c, 2213A.1; RCSC 2014 Section 7.2; DSA IR 17-8.
<input checked="" type="checkbox"/>	c. Bearing-type ("snug tight") connections.	Periodic	SI	Table 1705A.2.1 Item 2a, 1705A.2.6, 2204A.2; AISC 360-16 J3.1, J3.2, M2.5 & N5.6; RCSC 2014 Section 9.1; DSA IR 17-9.
<input checked="" type="checkbox"/>	d. Pretensioned and slip-critical connections.	*	SI	Table 1705A.2.1 Items 2b & 2c, 1705A.2.6, 2204A.2; AISC 360-16 J3.1, J3.2, M2.5 & N5.6; RCSC 2014 Sections 9.2 & 9.3; DSA IR 17-9. **"Continuous" or "Periodic" depends on the tightening method used.

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (STEEL AND ALUMNINUM), 2022 CBC

1705A.2.1, Table 1705A.2.1; AISC 303-16, AISC 341-16, AISC 358-16, AISC 360-16; AISI S100-20; RCSC 2014; AWS D1.1, AWS D1.2, AWS D1.3, AWS D1.4, AWS D1.8

Application Number: 02-122548	School Name: George Kelly Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-05-06 21:26:32

S/A3. WELDING:				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input checked="" type="checkbox"/>	a. Verify weld filler material identification markings per AWS designation listed on the DSA-approved documents and the WPS.	Periodic	SI	1705A.2.5, Table 1705A.2.1 Items 4 & 5; AWS D1.1 and AWS D1.8 for structural steel; AWS D1.2 for Aluminum; AWS D1.3 for cold-formed steel; AWS D1.4 for reinforcing steel; DSA IR 17-3.
<input checked="" type="checkbox"/>	b. Verify weld filler material manufacturer's certificate of compliance.	Periodic	SI	DSA IR 17-3.
<input checked="" type="checkbox"/>	c. Verify WPS, welder qualifications and equipment.	Periodic	SI	DSA IR 17-3.

S/A4. SHOP WELDING (IN ADDITION TO SECTION S/A3):				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input checked="" type="checkbox"/>	a. Inspect groove welds, multi-pass fillet welds, single pass fillet welds > 5/16", plug and slot welds.	Continuous	SI	Table 1705A.2.1 Items 5a.1 4; AISC 360-16 (and AISC 341-16 as applicable); DSA IR 17-3.
<input checked="" type="checkbox"/>	b. Inspect single-pass fillet welds ≤ 5/16", floor and roof deck welds.	Periodic	SI	1705A.2.2, Table 1705A.2.1 Items 5a.5 & 5a.6; AISC 360-16 (and AISC 341-16 as applicable); DSA IR 17-3.
<input type="checkbox"/>	c. Inspect welding of stairs and railing systems.	Periodic	SI	1705A.2.1; AISC 360-16 (and AISC 341-16 as applicable); AWS D1.1 & D1.3; DSA IR 17-3.
<input type="checkbox"/>	d. Verification of reinforcing steel weldability other than ASTM A706.	Periodic	SI	1705A.3.1; AWS D1.4; DSA IR 17-3. Verify carbon equivalent reported on mill certificates.
<input type="checkbox"/>	e. Inspect welding of reinforcing steel.	Continuous	SI	Table 1705A.2.1 Item 5b, 1705A.3.1, Table 1705A.3 Item 2, 1903A.8; AWS D1.4; DSA IR 17-3.

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (STEEL AND ALUMNINUM), 2022 CBC

1705A.2.1, Table 1705A.2.1; AISC 303-16, AISC 341-16, AISC 358-16, AISC 360-16; AISI S100-20; RCSC 2014; AWS D1.1, AWS D1.2, AWS D1.3, AWS D1.4, AWS D1.8

Application Number: 02-122548	School Name: George Kelly Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-05-06 21:26:32

	Test or Special Inspection	Type	Performed By	Code References and Notes
	S/A5. FIELD WELDING (IN ADDITION TO SECTION S/A3):			
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Inspect groove welds, multi-pass fillet welds, single pass fillet welds > 5/16", plug and slot welds.	Continuous	SI	Table 1705A.2.1 Items 5a.1 4; AISC 360-16 (AISC 341-16 as applicable); DSA IR 17-3.
<input type="checkbox"/>	b. Inspect single-pass fillet welds ≤ 5/16".	Periodic	SI	Table 1705A.2.1 Item 5a.5; AISC 360-16 (AISC 341-16 as applicable); DSA IR 17-3.
<input type="checkbox"/>	c. Inspect end-welded studs (ASTM A-108) installation (including bend test).	Periodic	SI	2213A.2; AISC 360-16 (AISC 341-16 as applicable); AWS D1.1; DSA IR 17-3.
<input type="checkbox"/>	d. Inspect floor and roof deck welds.	Periodic	SI	1705A.2.2, Table 1705A.2.1 Item 5a.6; AISC 360-16 (AISC 341-16 as applicable); AWS D1.3; DSA IR 17-3.
<input type="checkbox"/>	e. Inspect welding of structural cold-formed steel.	Periodic	SI*	1705A.2.5; AWS D1.3; DSA IR 17-3. The quality control provisions of AISI S240-20 Chapter D shall also apply. * May be performed by the project inspector when specifically approved by DSA.
<input type="checkbox"/>	f. Inspect welding of stairs and railing systems.	Periodic	SI*	1705A.2.1; AISC 360-16 (AISC 341-16 as applicable); AWS D1.1 & D1.3; DSA IR 17-3. * May be performed by the project inspector when specifically approved by DSA.
<input type="checkbox"/>	g. Verification of reinforcing steel weldability.	Periodic	SI	1705A.3.1; AWS D1.4; DSA IR 17-3. Verify carbon equivalent reported on mill certificates.
<input type="checkbox"/>	h. Inspect welding of reinforcing steel.	Continuous	SI	Table 1705A.2.1 Item 5b, 1705A.3.1, Table 1705A.3 Item 2, 1903A.8; AWS D1.4; DSA IR 17-3.

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (STEEL AND ALUMNINUM), 2022 CBC

1705A.2.1, Table 1705A.2.1; AISC 303-16, AISC 341-16, AISC 358-16, AISC 360-16; AISI S100-20; RCSC 2014; AWS D1.1, AWS D1.2, AWS D1.3, AWS D1.4, AWS D1.8

Application Number:

02-122548

School Name:

George Kelly Elementary School

School District:

Tracy Unified School District

DSA File Number:

39-73

Increment Number:

Date Created:

2024-05-06 21:26:32

	Test or Special Inspection	Type	Performed By	Code References and Notes
	S/A6. NONDESTRUCTIVE TESTING:			
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Ultrasonic	Test	LOR	1705A.2.1, 1705A.2.5; AISC 341-16 J6.2, AISC 360-16 N5.5; AWS D1.1, AWS D1.8; DSA IR 17-2.
<input type="checkbox"/>	b. Magnetic Particle	Test	LOR	1705A.2.1, 1705A.2.5; AISC 341-16 J6.2, AISC 360-16 N5.5; AWS D1.1, AWS D1.8; DSA IR 17-2.
<input type="checkbox"/>	c.	Test	LOR	

	S/A7. STEEL JOISTS AND TRUSSES:			
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Verify size, type and grade for all chord and web members as well as connectors and weld filler material; verify joist profile, dimensions and camber (if applicable); verify all weld locations, lengths and profiles; mark or tag each joist.	Continuous	SI	1705A.2.3, Table 1705A.2.3; AWS D1.1; DSA IR 22-3 for steel joists only. 1705A.2.4; AWS D1.3 for cold-formed steel trusses.

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (STEEL AND ALUMNINUM), 2022 CBC

1705A.2.1, Table 1705A.2.1; AISC 303-16, AISC 341-16, AISC 358-16, AISC 360-16; AISI S100-20; RCSC 2014; AWS D1.1, AWS D1.2, AWS D1.3, AWS D1.4, AWS D1.8

Application Number: 02-122548	School Name: George Kelly Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-05-06 21:26:32

	Test or Special Inspection	Type	Performed By	Code References and Notes
	S/A8. SPRAYED FIRE-RESISTANT MATERIALS:			
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Examine structural steel surface conditions, inspect application, take samples, measure thickness and verify compliance of all aspects of application with DSA-approved documents.	Periodic	SI	1705A.15, 1705A.15.1, 1705A.15.2, 1705A.15.3, 1705A.15.4, 1705A.15.5, 1705A.15.6.
<input type="checkbox"/>	b. Test density.	Test	LOR	1705A.15.1, 1705A.15.5, ASTM E605
<input type="checkbox"/>	c. Bond strength adhesion/cohesion.	Test	LOR	1705A.15.1, 1705A.15.6, ASTM E736

	S/A9. ANCHOR BOLTS AND ANCHOR RODS:			
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Anchor Bolts and Anchor Rods	Test	LOR	Identify, sample and test anchor bolts and anchor rods not meeting exemptions identified in Section 1 of IR 17-11.
<input type="checkbox"/>	b. Threaded rod not used for foundation anchorage.	Test	LOR	Identify, sample and test threaded rods not meeting exemptions identified in Section 1 of IR 17-11.

	S/A10. STORAGE RACK SYSTEMS:			
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Materials used, to verify compliance with one or more of the material test reports in accordance with the approved construction documents.	Periodic	SI	Table 1705A.13.7
<input type="checkbox"/>	b. Fabricated storage rack elements.	Periodic	SI	1704A.2.5; Table 1705A.13.7

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (STEEL AND ALUMNINUM), 2022 CBC

1705A.2.1, Table 1705A.2.1; AISC 303-16, AISC 341-16, AISC 358-16, AISC 360-16; AISI S100-20; RCSC 2014; AWS D1.1, AWS D1.2, AWS D1.3, AWS D1.4, AWS D1.8

Application Number:

02-122548

School Name:

George Kelly Elementary School

School District:

Tracy Unified School District

DSA File Number:

39-73

Increment Number:

Date Created:

2024-05-06 21:26:32

	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	c. Storage rack anchorage installation.	Periodic	SI	ANSI/MH16.1 Section 7.3.2; Table 1705A.13.7
<input type="checkbox"/>	d. Completed storage rack system to indicate compliance with the approved construction documents.	Periodic	SI*	Table 1705A.13.7; * May be preformed by the project inspector when specifically approved by DSA.

	S/A11. Other Steel			
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a.			

Appendix: Work Exempt from DSA Requirements for Structural Tests / Special Inspections

Application Number: 02-122548	School Name: George Kelly Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-05-06 21:26:32

Exempt items given in DSA IR A-22 or the 2022 CBC (including DSA amendments) and those items identified below with a check mark by the design professional are NOT subject to DSA requirements for the structural tests / special inspections noted. **Items marked as exempt shall be identified on the approved construction documents.** The project inspector shall verify all construction complies with the approved construction documents.

	SOILS:
<input type="checkbox"/>	1. Deep foundations acting as a cantilever footing with a design based on minimum allowable pressures per CBC Table 1806A.2 and without a geotechnical report for the following cases: A) free standing sign or scoreboard, B) cell or antenna towers and poles less than 35'-0" tall (e.g., lighting poles, flag poles, poles supporting open mesh fences, etc.), C) single-story structure with dead load less than 5 psf (e.g., open fabric shade structure), or D) covered walkway structure with an apex height less than 10'-0" above adjacent grade.
<input type="checkbox"/>	2. Shallow foundations, etc. are exempt from special inspections and testing by a Geotechnical Engineer for the following cases: A) buildings without a geotechnical report and meeting the exception item #1 criteria in CBC Section 1803A.2 supported by native soil (any excavation depth) or fill soil (not exceeding 12" depth per CBC Section 1804A.6), B) soil scarification/recompaction not exceeding 12" depth, C) native or fill soil supporting exterior non-structural flatwork (e.g., sidewalks, site concrete ramps, site stairs, parking lots, driveways, etc.), D) unpaved landscaping and playground areas, or E) utility trench backfill with depth not exceeding 12".

	CONCRETE/MASONRY:
<input type="checkbox"/>	1. Post-installed anchors for the following: A) exempt non-structural components (e.g., mechanical, electrical, plumbing equipment - see item 7 for "Welding" in the Appendix below) given in CBC Section 1617A.1.18 (which replaces ASCE 7-16, Section 13.1.4) or B) interior nonstructural wall partitions meeting criteria listed in exempt item 3 for "Welding" in the Appendix below
<input type="checkbox"/>	2. Concrete batch plant inspection is not required for items given in CBC Section 1705A.3.3.2 subject to the requirements and limitations in that section.
<input type="checkbox"/>	3. Non-bearing non-shear masonry walls may be exempt from certain DSA masonry testing and special inspection items as allowed per DSA IR 21-1. Refer to construction documents for specific exemptions accordingly for each applicable wall condition shown in Appendix A of IR 21-1.
<input type="checkbox"/>	4. Epoxy shear dowels in site flatwork and/or other non-structural concrete.

Appendix: Work Exempt from DSA Requirements for Structural Tests / Special Inspections

Application Number: 02-122548	School Name: George Kelly Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-05-06 21:26:32

	CONCRETE/MASONRY:
<input type="checkbox"/>	5. Testing of reinforcing bars is not required for items given in CBC Section 1910A.2 subject to the requirements and limitations in that section.

	WELDING:
<input type="checkbox"/>	1. Solid-clad and open-mesh fences, gates with maximum leaf span of 10', and gates with a maximum rolling section of 10' all having an apex height less than 8'-0" above lowest adjacent grade. When located above circulation or occupied space below, these gates/fences are not located within 1.5x gate/fence height (max 8'-0") to the edge of floor or roof.
<input type="checkbox"/>	2. Handrails, guardrails, and modular or relocatable ramps associated with walking surfaces less than 30" above adjacent grade (excluding post base connections per the 'Exception' language in Section 1705A.2.1); fillet welds shall not be ground flush.
<input type="checkbox"/>	3. Non-structural interior cold-formed steel framing spanning less than 15'-0", such as in interior partitions, interior soffits, etc. supporting only self weight and light-weight finishes or adhered tile, masonry, stone, or terra cotta veneer no more than 5/8" thickness and apex less than 20'-0" in height and not over an exit way. Maximum tributary load to a member shall not exceed the equivalent of that occurring from a 10'x10' opening in a 15' tall wall for a header or king stud.
<input type="checkbox"/>	4. Manufactured support frames and curbs using hot rolled or cold-formed steel (i.e., light gauge) for mechanical, electrical, or plumbing equipment weighing less than 2000# (equipment only) (connections of such frames to superstructure elements using welding will require special inspection as noted in selected item(s) for Sections S/A3, S/A4 and/or S/A5 of listing above).
<input type="checkbox"/>	5. Manufactured components (e.g., Tolco, B-Line, Afcon, etc.) for mechanical, electrical, or plumbing hanger support and bracing (connections of such components to superstructure elements using welding will require special inspection as noted in selected item(s) for Sections S/A3, S/A4 and/or S/A5 of listing above).
<input type="checkbox"/>	6. TV Brackets, projector mounts with a valid listing (see DSA IR A-5) and recreational equipment (e.g., playground structures, basketball backstops, etc.) (connections of such elements to superstructure elements using welding will require special inspection as noted in selected item(s) for sections S/A3, S/A4 and/or S/A5 located in the Steel/Aluminum category of listing above).

Appendix: Work Exempt from DSA Requirements for Structural Tests / Special Inspections

Application Number: 02-122548	School Name: George Kelly Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-05-06 21:26:32

	WELDING:
<input type="checkbox"/>	7. Any support for exempt non-structural components given in CBC Section 1617A.1.18 (which replaces ASCE 7-16, Section 13.1.4) meeting the following: A) when supported on a floor/roof, <400# and resulting composite center of mass (including component's center of mass) ≤4' above supporting floor/roof, B) when hung from a wall or roof/floor, <20# for discrete units or <5 plf for distributed systems.

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS(SIGNATURE), 2022 CBC

Application Number:

02-122548

School Name:

George Kelly Elementary School

School District:

Tracy Unified School District

DSA File Number:

39-73

Increment Number:

Date Created:

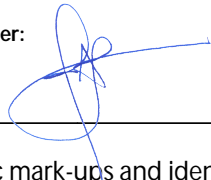
2024-05-06 21:26:32

Name of Architect or Engineer in general responsible charge:

Jeffrey Grau

Name of Structural Engineer (When structural design has been delegated):

Signature of Architect or Structural Engineer:



Date:

05/09/24

Note: To facilitate DSA electronic mark-ups and identification stamp application, DSA recommends against using secured electronic or digital signatures.

DSA STAMP

DSA 103-22: LIST OF REQUIRED VERIFIED REPORTS, CBC 2022

Application Number: 02-122548	School Name: George Kelly Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-05-06 21:26:32

1. Structural Testing and Inspection: Laboratory Verified Report Form DSA 291

2. Shop Welding Inspection: Laboratory Verified Report Form DSA 291, or, for independently contracting SI, Special Inspection Verified Report Form DSA 292

3. High-Strength Bolt Installation Inspection: Laboratory Verified Report Form DSA 291, or, for independently contracting SI, Special Inspection Verified Report Form DSA 292

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS, 2022 CBC

General

Application Number: 02-122550	School Name: McKinley Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-05-06 21:34:51

IMPORTANT: This form is only a summary list of structural tests and some of the special inspections required for the project. Generally, the structural tests and special inspections noted on this form are those that will be performed by the Geotechnical Engineer of Record, Laboratory of Record, or Special Inspector. The actual complete test and inspection program must be performed as detailed on the DSA approved documents. The appendix at the bottom of this form identifies work NOT subject to DSA requirements for special inspection or structural testing. The project inspector is responsible for providing inspection of all facets of construction, including but not limited to, special inspections not listed on this form such as structural wood framing, high-load wood diaphragms, cold-formed steel framing, anchorage of non-structural components, etc., per Title 24, Part 2, Chapter 17A (2022 CBC).

****NOTE:** Undefined section and table references found in this document are from the CBC, or California Building Code.

KEY TO COLUMNS

1. TYPE	2. PERFORMED BY
Continuous – Indicates that a continuous special inspection is required	GE (Geotechnical Engineer) – Indicates that the special inspection shall be performed by a registered geotechnical engineer or his or her authorized representative.
Periodic – Indicates that a periodic special inspection is required	LOR (Laboratory of Record) – Indicates that the test or special inspection shall be performed by a testing laboratory accepted in the DSA Laboratory Evaluation and Acceptance (LEA) Program. See CAC Section 4-335.
Test – Indicates that a test is required	PI (Project Inspector) – Indicates that the special inspection may be performed by a project inspector when specifically approved by DSA.
	SI (Special Inspection) – Indicates that the special inspection shall be performed by an appropriately qualified/approved special inspector.

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (SOILS), 2022 CBC

Table 1705A.6, Table 1705A.7, Table 1705A.8

Application Number: 02-122550	School Name: McKinley Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-05-06 21:34:51

Geotechnical Reports: Project does NOT have and does NOT require a geotechnical report

S1. GENERAL:				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input checked="" type="checkbox"/>	a. Verify that: <ul style="list-style-type: none">• Site has been prepared properly prior to placement of controlled fill and/or excavations for foundations.• Foundation excavations are extended to proper depth and have reached proper material.• Materials below footings must not contain loose material, mud, organic silt, organic clays, or peat.	See Notes	PI	Refer to specific items identified in the Appendix listing exemptions for limitations. Placement of controlled fill exceeding 12" depth under foundations and/or within the building envelope is not permitted without a geotechnical report.

S2. SOIL COMPACTION AND FILL:				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Perform classification and testing of fill materials.	Test	LOR*	* Under the supervision of the geotechnical engineer.
<input checked="" type="checkbox"/>	b. Verify use of proper materials, densities and inspect lift thicknesses, placement and compaction during placement of fill.	Continuous	LOR*	* Under the supervision of a geotechnical engineer or LOR's engineering manager. Refer to specific items identified in the Appendix listing exemptions for limitations.
<input checked="" type="checkbox"/>	c. Compaction testing.	Test	LOR*	* Under the supervision of a geotechnical engineer or LOR's engineering manager. Refer to specific items identified in the Appendix listing exemptions for limitations.

S3. DRIVEN DEEP FOUNDATIONS (PILES):				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Verify pile materials, sizes and lengths comply with the requirements.	Continuous	GE*	* By geotechnical engineer or his or her qualified representative.

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (SOILS), 2022 CBC

Table 1705A.6, Table 1705A.7, Table 1705A.8

Application Number: 02-122550	School Name: McKinley Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-05-06 21:34:51

	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	b. Determine capacities of test piles and conduct additional load tests as required.	Test	LOR*	* Under the supervision of the geotechnical engineer.
<input type="checkbox"/>	c. Inspect driving operations and maintain complete and accurate records for each pile.	Continuous	GE*	* By geotechnical engineer or his or her qualified representative.
<input type="checkbox"/>	d. Verify locations of piles and their plumbness, confirm type and size of hammer, record number of blows per foot of penetration, determine required penetrations to achieve design capacity, record tip and butt elevations and record any pile damage.	Continuous	GE*	* By geotechnical engineer or his or her qualified representative.
<input type="checkbox"/>	e. Steel piles.	Provide tests and inspections per STEEL section below.		
<input type="checkbox"/>	f. Concrete piles and concrete filled piles.	Provide tests and inspections per CONCRETE section below.		
<input type="checkbox"/>	g. For specialty piles, perform additional inspections as determined by the registered design professional in responsible charge.	*	*	* As defined on drawings or specifications.

	S4. CAST-IN-PLACE DEEP FOUNDATIONS (PIERS):			
	Test or Special Inspection	Type	Performed By	Code References and Note
<input checked="" type="checkbox"/>	a. Inspect drilling operations and maintain complete and accurate records for each pier.	Continuous	PI	Continuous inspection to be provided by project inspector. Refer to specific items identified in the Appendix listing exemptions for limitations.
<input checked="" type="checkbox"/>	b. Verify pier locations, diameters, plumbness and lengths. Record concrete or grout volumes.	Continuous	PI	Continuous inspection to be provided by project inspector. Refer to specific items identified in the Appendix listing exemptions for limitations.
<input checked="" type="checkbox"/>	c. Concrete piers.	Provide tests and inspections per CONCRETE section below.		

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (SOILS), 2022 CBC

Table 1705A.6, Table 1705A.7, Table 1705A.8

Application Number: 02-122550	School Name: McKinley Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-05-06 21:34:51

	Test or Special Inspection	Type	Performed By	Code References and Notes
	S5. RETAINING WALLS:			
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Placement, compaction and inspection of backfill.	Continuous	GE*	1705A.6.1. * By geotechnical engineer or his or her qualified representative. (See section S2 above).
<input type="checkbox"/>	b. Placement of soil reinforcement and/or drainage devices.	Continuous	GE*	* By geotechnical engineer or his or her qualified representative.
<input type="checkbox"/>	c. Segmental retaining walls; inspect placement of units, dowels, connectors, etc.	Continuous	GE*	* By geotechnical engineer or his or her qualified representative. See DSA IR 18-2.
<input type="checkbox"/>	d. Concrete retaining walls.	Provide tests and inspections per CONCRETE section below.		
<input type="checkbox"/>	e. Masonry retaining walls.	Provide tests and inspections per MASONRY section below.		

	S6. OTHER SOILS:			
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Soil Improvements	Test	GE*	Submit a comprehensive report documenting final soil improvements constructed, construction observation and the results of the confirmation testing and analysis to CGS (California Geological Survey) for final acceptance. * By geotechnical engineer or his or her qualified representative.
<input type="checkbox"/>	b. Inspection of Soil Improvements	Continuous	GE*	* By geotechnical engineer or his or her qualified representative.
<input type="checkbox"/>	c.			

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (CONCRETE), 2022 CBC

Table 1705A.3; ACI 318-19 Sections 26.12 & 26.13

Application Number: 02-122550	School Name: McKinley Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-05-06 21:34:51

C1. CAST-IN-PLACE CONCRETE				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input checked="" type="checkbox"/>	a. Verify use of required design mix.	Continuous	SI	Table 1705A.3 Item 5, 1910A.1.
<input checked="" type="checkbox"/>	b. Identify, sample, and test reinforcing steel.	Test	LOR	1910A.2; ACI 318-19 Ch.20 and Section 26.6.1.2; DSA IR 17-10. (See Appendix (end of this form) for exemptions.)
<input checked="" type="checkbox"/>	c. During concrete placement, fabricate specimens for strength tests, perform slump and air content tests, and determine the temperature of the concrete.	Test	LOR	Table 1705A.3 Item 6; ACI 318-19 Sections 26.5 & 26.12.
<input checked="" type="checkbox"/>	d. Test concrete (f'_c).	Test	LOR	1905A.1.17; ACI 318-19 Section 26.12.
<input checked="" type="checkbox"/>	e. Batch plant inspection:	See Notes	SI	Default of 'Continuous' per 1705A.3.3. If approved by DSA, batch plant inspection may be reduced to 'Periodic' subject to requirements in Section 1705A.3.3.1, or not required per 1705A.3.3.2. See IR 17-13. (See Appendix (end of this form) for exemptions.)
<input type="checkbox"/>	f. Welding of reinforcing steel.	Provide special inspection per STEEL, Category S/A4(d) & (e) and/or S/A5(g) & (h) below.		

C2. PRESTRESSED / POST-TENSIONED CONCRETE (IN ADDITION TO SECTION C1):				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Sample and test prestressing tendons and anchorages.	Test	LOR	1705A.3.4, 1910A.3
<input type="checkbox"/>	b. Inspect placement of prestressing tendons.	Periodic	SI	1705A.3.4, Table 1705A.3 Items 1 & 9.

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (CONCRETE), 2022 CBC

Table 1705A.3; ACI 318-19 Sections 26.12 & 26.13

Application Number: 02-122550	School Name: McKinley Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-05-06 21:34:51

	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	c. Verify in-situ concrete strength prior to stressing of post-tensioning tendons.	Periodic	SI	Table 1705A.3 Item 13. Special inspector to verify specified concrete strength test prior to stressing.
<input type="checkbox"/>	d. Inspect application of post-tensioning or prestressing forces and grouting of bonded prestressing tendons.	Continuous	SI	1705A.3.4, Table 1705A.3 Item 9; ACI 318-19 Section 26.13

	C3. PRECAST CONCRETE (IN ADDITION TO SECTION C1):			
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Inspect fabrication of precast concrete members.	Continuous	SI	ACI 318-19 Section 26.13, and PCI MNL-128 and -130.
<input type="checkbox"/>	b. Inspect erection of precast concrete members.	Periodic	SI*	Table 1705A.3 Item 10. * May be performed by PI when specifically approved by DSA.
<input type="checkbox"/>	c. For precast concrete diaphragm connections or reinforcement at joints classified as moderate or high deformability elements (MDE or HDE) in structures assigned to Seismic Design Category D, E or F, inspect such connections and reinforcement in the field for: 1. Installation of the embedded parts 2. Completion of the continuity of reinforcement across joints. 3. Completion of connections in the field.	Continuous	SI	Table 1705A.3; ACI 318-19 Section 26.13.1.3; ACI 550.5
<input type="checkbox"/>	d. Inspect installation tolerances of precast concrete diaphragm connections for compliance with ACI 550.5.	Periodic	SI	Table 1705A.3; ACI 318-19 Section 26.13.1.3; ACI 550.5

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (CONCRETE), 2022 CBC

Table 1705A.3; ACI 318-19 Sections 26.12 & 26.13

Application Number: 02-122550	School Name: McKinley Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-05-06 21:34:51

C4. SHOTCRETE (IN ADDITION TO SECTION C1):				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Inspect shotcrete placement for proper application techniques.	Continuous	SI	1705A.3.9, Table 1705A.3 Item 7, 1908A.1, 1908A.2, 1908A.3. See ACI 506.2-13 Section 3.4, ACI 506R-16.
<input type="checkbox"/>	b. Sample and test shotcrete (f'_c).	Test	LOR	1908A.2, 1705A.3.9

C5. POST-INSTALLED ANCHORS:				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Inspect installation of post-installed anchors	See Notes	SI*	1617A.1.19, Table 1705A.3 Item 4a (Continuous) & 4b (Periodic), 1705A.3.8 (See Appendix (end of this form) for exemptions). ACI 318-19 Section 26.13. * May be performed by the project inspector when specifically approved by DSA.
<input type="checkbox"/>	b. Test post-installed anchors.	Test	LOR	1910A.5. (See Appendix (end of this form) for exemptions.)

C6. OTHER CONCRETE:				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a.			

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (STEEL AND ALUMINUM), 2022 CBC

1705A.2.1, Table 1705A.2.1; AISC 303-16, AISC 341-16, AISC 358-16, AISC 360-16; AISI S100-20; RCSC 2014; AWS D1.1, AWS D1.2, AWS D1.3, AWS D1.4, AWS D1.8

Application Number: 02-122550	School Name: McKinley Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-05-06 21:34:51

S/A1. STRUCTURAL STEEL, COLD-FORMED STEEL AND ALUMINUM USED FOR STRUCTURAL PURPOSES				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input checked="" type="checkbox"/>	a. Verify identification of all materials and: • Mill certificates indicate material properties that comply with requirements. • Material sizes, types and grades comply with requirements.	Periodic	*	Table 1705A.2.1 Item 3a 3c. 2202A.1; AISI S100-20 Section A3.1 & A3.2, AISI S240-20 Section A3 & A5, AISI S220-20 Sections A4 & A6. * By special inspector or qualified technician when performed off-site.
<input checked="" type="checkbox"/>	b. Test unidentified materials	Test	LOR	2202A.1.
<input checked="" type="checkbox"/>	c. Examine seam welds of HSS shapes	Periodic	SI	DSA IR 17-3.
<input checked="" type="checkbox"/>	d. Verify and document steel fabrication per DSA-approved construction documents.	Periodic	SI	Not applicable to cold-formed steel light-frame construction, except for trusses (1705A.2.4).
<input type="checkbox"/>	e. Buckling restrained braces.	Test	LOR	Testing and special inspections in accordance with IR 22-4.

S/A2. HIGH-STRENGTH BOLTS:				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input checked="" type="checkbox"/>	a. Verify identification markings and manufacturer's certificates of compliance conform to ASTM standards specified in the DSA-approved documents.	Periodic	SI	Table 1705A.2.1 Items 1a & 1b, 2202A.1; AISC 360-16 Section A3.3, J3.1, and N3.2; RCSC 2014 Section 1.5 & 2.1; DSA IR 17-8 & DSA IR 17-9.
<input checked="" type="checkbox"/>	b. Test high-strength bolts, nuts and washers.	Test	LOR	Table 1705A.2.1 Item 1c, 2213A.1; RCSC 2014 Section 7.2; DSA IR 17-8.
<input checked="" type="checkbox"/>	c. Bearing-type ("snug tight") connections.	Periodic	SI	Table 1705A.2.1 Item 2a, 1705A.2.6, 2204A.2; AISC 360-16 J3.1, J3.2, M2.5 & N5.6; RCSC 2014 Section 9.1; DSA IR 17-9.
<input checked="" type="checkbox"/>	d. Pretensioned and slip-critical connections.	*	SI	Table 1705A.2.1 Items 2b & 2c, 1705A.2.6, 2204A.2; AISC 360-16 J3.1, J3.2, M2.5 & N5.6; RCSC 2014 Sections 9.2 & 9.3; DSA IR 17-9. **"Continuous" or "Periodic" depends on the tightening method used.

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (STEEL AND ALUMNINUM), 2022 CBC

1705A.2.1, Table 1705A.2.1; AISC 303-16, AISC 341-16, AISC 358-16, AISC 360-16; AISI S100-20; RCSC 2014; AWS D1.1, AWS D1.2, AWS D1.3, AWS D1.4, AWS D1.8

Application Number: 02-122550	School Name: McKinley Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-05-06 21:34:51

S/A3. WELDING:				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input checked="" type="checkbox"/>	a. Verify weld filler material identification markings per AWS designation listed on the DSA-approved documents and the WPS.	Periodic	SI	1705A.2.5, Table 1705A.2.1 Items 4 & 5; AWS D1.1 and AWS D1.8 for structural steel; AWS D1.2 for Aluminum; AWS D1.3 for cold-formed steel; AWS D1.4 for reinforcing steel; DSA IR 17-3.
<input checked="" type="checkbox"/>	b. Verify weld filler material manufacturer's certificate of compliance.	Periodic	SI	DSA IR 17-3.
<input checked="" type="checkbox"/>	c. Verify WPS, welder qualifications and equipment.	Periodic	SI	DSA IR 17-3.

S/A4. SHOP WELDING (IN ADDITION TO SECTION S/A3):				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input checked="" type="checkbox"/>	a. Inspect groove welds, multi-pass fillet welds, single pass fillet welds > 5/16", plug and slot welds.	Continuous	SI	Table 1705A.2.1 Items 5a.1 4; AISC 360-16 (and AISC 341-16 as applicable); DSA IR 17-3.
<input checked="" type="checkbox"/>	b. Inspect single-pass fillet welds ≤ 5/16", floor and roof deck welds.	Periodic	SI	1705A.2.2, Table 1705A.2.1 Items 5a.5 & 5a.6; AISC 360-16 (and AISC 341-16 as applicable); DSA IR 17-3.
<input type="checkbox"/>	c. Inspect welding of stairs and railing systems.	Periodic	SI	1705A.2.1; AISC 360-16 (and AISC 341-16 as applicable); AWS D1.1 & D1.3; DSA IR 17-3.
<input type="checkbox"/>	d. Verification of reinforcing steel weldability other than ASTM A706.	Periodic	SI	1705A.3.1; AWS D1.4; DSA IR 17-3. Verify carbon equivalent reported on mill certificates.
<input type="checkbox"/>	e. Inspect welding of reinforcing steel.	Continuous	SI	Table 1705A.2.1 Item 5b, 1705A.3.1, Table 1705A.3 Item 2, 1903A.8; AWS D1.4; DSA IR 17-3.

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (STEEL AND ALUMNINUM), 2022 CBC

1705A.2.1, Table 1705A.2.1; AISC 303-16, AISC 341-16, AISC 358-16, AISC 360-16; AISI S100-20; RCSC 2014; AWS D1.1, AWS D1.2, AWS D1.3, AWS D1.4, AWS D1.8

Application Number: 02-122550	School Name: McKinley Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-05-06 21:34:51

	Test or Special Inspection	Type	Performed By	Code References and Notes
	S/A5. FIELD WELDING (IN ADDITION TO SECTION S/A3):			
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Inspect groove welds, multi-pass fillet welds, single pass fillet welds > 5/16", plug and slot welds.	Continuous	SI	Table 1705A.2.1 Items 5a.1 4; AISC 360-16 (AISC 341-16 as applicable); DSA IR 17-3.
<input type="checkbox"/>	b. Inspect single-pass fillet welds ≤ 5/16".	Periodic	SI	Table 1705A.2.1 Item 5a.5; AISC 360-16 (AISC 341-16 as applicable); DSA IR 17-3.
<input type="checkbox"/>	c. Inspect end-welded studs (ASTM A-108) installation (including bend test).	Periodic	SI	2213A.2; AISC 360-16 (AISC 341-16 as applicable); AWS D1.1; DSA IR 17-3.
<input type="checkbox"/>	d. Inspect floor and roof deck welds.	Periodic	SI	1705A.2.2, Table 1705A.2.1 Item 5a.6; AISC 360-16 (AISC 341-16 as applicable); AWS D1.3; DSA IR 17-3.
<input type="checkbox"/>	e. Inspect welding of structural cold-formed steel.	Periodic	SI*	1705A.2.5; AWS D1.3; DSA IR 17-3. The quality control provisions of AISI S240-20 Chapter D shall also apply. * May be performed by the project inspector when specifically approved by DSA.
<input type="checkbox"/>	f. Inspect welding of stairs and railing systems.	Periodic	SI*	1705A.2.1; AISC 360-16 (AISC 341-16 as applicable); AWS D1.1 & D1.3; DSA IR 17-3. * May be performed by the project inspector when specifically approved by DSA.
<input type="checkbox"/>	g. Verification of reinforcing steel weldability.	Periodic	SI	1705A.3.1; AWS D1.4; DSA IR 17-3. Verify carbon equivalent reported on mill certificates.
<input type="checkbox"/>	h. Inspect welding of reinforcing steel.	Continuous	SI	Table 1705A.2.1 Item 5b, 1705A.3.1, Table 1705A.3 Item 2, 1903A.8; AWS D1.4; DSA IR 17-3.

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (STEEL AND ALUMNINUM), 2022 CBC

1705A.2.1, Table 1705A.2.1; AISC 303-16, AISC 341-16, AISC 358-16, AISC 360-16; AISI S100-20; RCSC 2014; AWS D1.1, AWS D1.2, AWS D1.3, AWS D1.4, AWS D1.8

Application Number:

02-122550

School Name:

McKinley Elementary School

School District:

Tracy Unified School District

DSA File Number:

39-73

Increment Number:

Date Created:

2024-05-06 21:34:51

	Test or Special Inspection	Type	Performed By	Code References and Notes
	S/A6. NONDESTRUCTIVE TESTING:			
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Ultrasonic	Test	LOR	1705A.2.1, 1705A.2.5; AISC 341-16 J6.2, AISC 360-16 N5.5; AWS D1.1, AWS D1.8; DSA IR 17-2.
<input type="checkbox"/>	b. Magnetic Particle	Test	LOR	1705A.2.1, 1705A.2.5; AISC 341-16 J6.2, AISC 360-16 N5.5; AWS D1.1, AWS D1.8; DSA IR 17-2.
<input type="checkbox"/>	c.	Test	LOR	

	S/A7. STEEL JOISTS AND TRUSSES:			
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Verify size, type and grade for all chord and web members as well as connectors and weld filler material; verify joist profile, dimensions and camber (if applicable); verify all weld locations, lengths and profiles; mark or tag each joist.	Continuous	SI	1705A.2.3, Table 1705A.2.3; AWS D1.1; DSA IR 22-3 for steel joists only. 1705A.2.4; AWS D1.3 for cold-formed steel trusses.

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (STEEL AND ALUMNINUM), 2022 CBC

1705A.2.1, Table 1705A.2.1; AISC 303-16, AISC 341-16, AISC 358-16, AISC 360-16; AISI S100-20; RCSC 2014; AWS D1.1, AWS D1.2, AWS D1.3, AWS D1.4, AWS D1.8

Application Number: 02-122550	School Name: McKinley Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-05-06 21:34:51

	Test or Special Inspection	Type	Performed By	Code References and Notes
	S/A8. SPRAYED FIRE-RESISTANT MATERIALS:			
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Examine structural steel surface conditions, inspect application, take samples, measure thickness and verify compliance of all aspects of application with DSA-approved documents.	Periodic	SI	1705A.15, 1705A.15.1, 1705A.15.2, 1705A.15.3, 1705A.15.4, 1705A.15.5, 1705A.15.6.
<input type="checkbox"/>	b. Test density.	Test	LOR	1705A.15.1, 1705A.15.5, ASTM E605
<input type="checkbox"/>	c. Bond strength adhesion/cohesion.	Test	LOR	1705A.15.1, 1705A.15.6, ASTM E736

	S/A9. ANCHOR BOLTS AND ANCHOR RODS:			
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Anchor Bolts and Anchor Rods	Test	LOR	Identify, sample and test anchor bolts and anchor rods not meeting exemptions identified in Section 1 of IR 17-11.
<input type="checkbox"/>	b. Threaded rod not used for foundation anchorage.	Test	LOR	Identify, sample and test threaded rods not meeting exemptions identified in Section 1 of IR 17-11.

	S/A10. STORAGE RACK SYSTEMS:			
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Materials used, to verify compliance with one or more of the material test reports in accordance with the approved construction documents.	Periodic	SI	Table 1705A.13.7
<input type="checkbox"/>	b. Fabricated storage rack elements.	Periodic	SI	1704A.2.5; Table 1705A.13.7

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (STEEL AND ALUMNINUM), 2022 CBC

1705A.2.1, Table 1705A.2.1; AISC 303-16, AISC 341-16, AISC 358-16, AISC 360-16; AISI S100-20; RCSC 2014; AWS D1.1, AWS D1.2, AWS D1.3, AWS D1.4, AWS D1.8

Application Number: 02-122550	School Name: McKinley Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-05-06 21:34:51

	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	c. Storage rack anchorage installation.	Periodic	SI	ANSI/MH16.1 Section 7.3.2; Table 1705A.13.7
<input type="checkbox"/>	d. Completed storage rack system to indicate compliance with the approved construction documents.	Periodic	SI*	Table 1705A.13.7; * May be preformed by the project inspector when specifically approved by DSA.

	S/A11. Other Steel			
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a.			

Appendix: Work Exempt from DSA Requirements for Structural Tests / Special Inspections

Application Number: 02-122550	School Name: McKinley Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-05-06 21:34:51

Exempt items given in DSA IR A-22 or the 2022 CBC (including DSA amendments) and those items identified below with a check mark by the design professional are NOT subject to DSA requirements for the structural tests / special inspections noted. **Items marked as exempt shall be identified on the approved construction documents.** The project inspector shall verify all construction complies with the approved construction documents.

	SOILS:
<input type="checkbox"/>	1. Deep foundations acting as a cantilever footing with a design based on minimum allowable pressures per CBC Table 1806A.2 and without a geotechnical report for the following cases: A) free standing sign or scoreboard, B) cell or antenna towers and poles less than 35'-0" tall (e.g., lighting poles, flag poles, poles supporting open mesh fences, etc.), C) single-story structure with dead load less than 5 psf (e.g., open fabric shade structure), or D) covered walkway structure with an apex height less than 10'-0" above adjacent grade.
<input type="checkbox"/>	2. Shallow foundations, etc. are exempt from special inspections and testing by a Geotechnical Engineer for the following cases: A) buildings without a geotechnical report and meeting the exception item #1 criteria in CBC Section 1803A.2 supported by native soil (any excavation depth) or fill soil (not exceeding 12" depth per CBC Section 1804A.6), B) soil scarification/recompaction not exceeding 12" depth, C) native or fill soil supporting exterior non-structural flatwork (e.g., sidewalks, site concrete ramps, site stairs, parking lots, driveways, etc.), D) unpaved landscaping and playground areas, or E) utility trench backfill with depth not exceeding 12".

	CONCRETE/MASONRY:
<input type="checkbox"/>	1. Post-installed anchors for the following: A) exempt non-structural components (e.g., mechanical, electrical, plumbing equipment - see item 7 for "Welding" in the Appendix below) given in CBC Section 1617A.1.18 (which replaces ASCE 7-16, Section 13.1.4) or B) interior nonstructural wall partitions meeting criteria listed in exempt item 3 for "Welding" in the Appendix below
<input type="checkbox"/>	2. Concrete batch plant inspection is not required for items given in CBC Section 1705A.3.3.2 subject to the requirements and limitations in that section.
<input type="checkbox"/>	3. Non-bearing non-shear masonry walls may be exempt from certain DSA masonry testing and special inspection items as allowed per DSA IR 21-1. Refer to construction documents for specific exemptions accordingly for each applicable wall condition shown in Appendix A of IR 21-1.
<input type="checkbox"/>	4. Epoxy shear dowels in site flatwork and/or other non-structural concrete.

Appendix: Work Exempt from DSA Requirements for Structural Tests / Special Inspections

Application Number: 02-122550	School Name: McKinley Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-05-06 21:34:51

	CONCRETE/MASONRY:
<input type="checkbox"/>	5. Testing of reinforcing bars is not required for items given in CBC Section 1910A.2 subject to the requirements and limitations in that section.

	WELDING:
<input type="checkbox"/>	1. Solid-clad and open-mesh fences, gates with maximum leaf span of 10', and gates with a maximum rolling section of 10' all having an apex height less than 8'-0" above lowest adjacent grade. When located above circulation or occupied space below, these gates/fences are not located within 1.5x gate/fence height (max 8'-0") to the edge of floor or roof.
<input type="checkbox"/>	2. Handrails, guardrails, and modular or relocatable ramps associated with walking surfaces less than 30" above adjacent grade (excluding post base connections per the 'Exception' language in Section 1705A.2.1); fillet welds shall not be ground flush.
<input type="checkbox"/>	3. Non-structural interior cold-formed steel framing spanning less than 15'-0", such as in interior partitions, interior soffits, etc. supporting only self weight and light-weight finishes or adhered tile, masonry, stone, or terra cotta veneer no more than 5/8" thickness and apex less than 20'-0" in height and not over an exit way. Maximum tributary load to a member shall not exceed the equivalent of that occurring from a 10'x10' opening in a 15' tall wall for a header or king stud.
<input type="checkbox"/>	4. Manufactured support frames and curbs using hot rolled or cold-formed steel (i.e., light gauge) for mechanical, electrical, or plumbing equipment weighing less than 2000# (equipment only) (connections of such frames to superstructure elements using welding will require special inspection as noted in selected item(s) for Sections S/A3, S/A4 and/or S/A5 of listing above).
<input type="checkbox"/>	5. Manufactured components (e.g., Tolco, B-Line, Afcon, etc.) for mechanical, electrical, or plumbing hanger support and bracing (connections of such components to superstructure elements using welding will require special inspection as noted in selected item(s) for Sections S/A3, S/A4 and/or S/A5 of listing above).
<input type="checkbox"/>	6. TV Brackets, projector mounts with a valid listing (see DSA IR A-5) and recreational equipment (e.g., playground structures, basketball backstops, etc.) (connections of such elements to superstructure elements using welding will require special inspection as noted in selected item(s) for sections S/A3, S/A4 and/or S/A5 located in the Steel/Aluminum category of listing above).

Appendix: Work Exempt from DSA Requirements for Structural Tests / Special Inspections

Application Number: 02-122550	School Name: McKinley Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-05-06 21:34:51

	WELDING:
<input type="checkbox"/>	7. Any support for exempt non-structural components given in CBC Section 1617A.1.18 (which replaces ASCE 7-16, Section 13.1.4) meeting the following: A) when supported on a floor/roof, <400# and resulting composite center of mass (including component's center of mass) ≤4' above supporting floor/roof, B) when hung from a wall or roof/floor, <20# for discrete units or <5 plf for distributed systems.

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS(SIGNATURE), 2022 CBC

Application Number:

02-122550

School Name:

McKinley Elementary School

School District:

Tracy Unified School District

DSA File Number:

39-73

Increment Number:

Date Created:

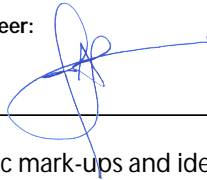
2024-05-06 21:34:51

Name of Architect or Engineer in general responsible charge:

Jeffrey Grau

Name of Structural Engineer (When structural design has been delegated):

Signature of Architect or Structural Engineer:



Date:

05/09/24

Note: To facilitate DSA electronic mark-ups and identification stamp application, DSA recommends against using secured electronic or digital signatures.

DSA STAMP

DSA 103-22: LIST OF REQUIRED VERIFIED REPORTS, CBC 2022

Application Number: 02-122550	School Name: McKinley Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-05-06 21:34:51

1. Structural Testing and Inspection: Laboratory Verified Report Form DSA 291

2. Shop Welding Inspection: Laboratory Verified Report Form DSA 291, or, for independently contracting SI, Special Inspection Verified Report Form DSA 292

3. High-Strength Bolt Installation Inspection: Laboratory Verified Report Form DSA 291, or, for independently contracting SI, Special Inspection Verified Report Form DSA 292

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS, 2022 CBC

General

Application Number: 02-122549	School Name: Villalovoz Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-05-06 21:37:49

IMPORTANT: This form is only a summary list of structural tests and some of the special inspections required for the project. Generally, the structural tests and special inspections noted on this form are those that will be performed by the Geotechnical Engineer of Record, Laboratory of Record, or Special Inspector. The actual complete test and inspection program must be performed as detailed on the DSA approved documents. The appendix at the bottom of this form identifies work NOT subject to DSA requirements for special inspection or structural testing. The project inspector is responsible for providing inspection of all facets of construction, including but not limited to, special inspections not listed on this form such as structural wood framing, high-load wood diaphragms, cold-formed steel framing, anchorage of non-structural components, etc., per Title 24, Part 2, Chapter 17A (2022 CBC).

****NOTE:** Undefined section and table references found in this document are from the CBC, or California Building Code.

KEY TO COLUMNS

1. TYPE	2. PERFORMED BY
Continuous – Indicates that a continuous special inspection is required	GE (Geotechnical Engineer) – Indicates that the special inspection shall be performed by a registered geotechnical engineer or his or her authorized representative.
Periodic – Indicates that a periodic special inspection is required	LOR (Laboratory of Record) – Indicates that the test or special inspection shall be performed by a testing laboratory accepted in the DSA Laboratory Evaluation and Acceptance (LEA) Program. See CAC Section 4-335.
Test – Indicates that a test is required	PI (Project Inspector) – Indicates that the special inspection may be performed by a project inspector when specifically approved by DSA.
	SI (Special Inspection) – Indicates that the special inspection shall be performed by an appropriately qualified/approved special inspector.

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (SOILS), 2022 CBC

Table 1705A.6, Table 1705A.7, Table 1705A.8

Application Number: 02-122549	School Name: Villalovoz Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-05-06 21:37:49

Geotechnical Reports: Project does NOT have and does NOT require a geotechnical report

S1. GENERAL:				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input checked="" type="checkbox"/>	a. Verify that: <ul style="list-style-type: none">• Site has been prepared properly prior to placement of controlled fill and/or excavations for foundations.• Foundation excavations are extended to proper depth and have reached proper material.• Materials below footings must not contain loose material, mud, organic silt, organic clays, or peat.	See Notes	PI	Refer to specific items identified in the Appendix listing exemptions for limitations. Placement of controlled fill exceeding 12" depth under foundations and/or within the building envelope is not permitted without a geotechnical report.

S2. SOIL COMPACTION AND FILL:				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Perform classification and testing of fill materials.	Test	LOR*	* Under the supervision of the geotechnical engineer.
<input checked="" type="checkbox"/>	b. Verify use of proper materials, densities and inspect lift thicknesses, placement and compaction during placement of fill.	Continuous	LOR*	* Under the supervision of a geotechnical engineer or LOR's engineering manager. Refer to specific items identified in the Appendix listing exemptions for limitations.
<input checked="" type="checkbox"/>	c. Compaction testing.	Test	LOR*	* Under the supervision of a geotechnical engineer or LOR's engineering manager. Refer to specific items identified in the Appendix listing exemptions for limitations.

S3. DRIVEN DEEP FOUNDATIONS (PILES):				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Verify pile materials, sizes and lengths comply with the requirements.	Continuous	GE*	* By geotechnical engineer or his or her qualified representative.

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (SOILS), 2022 CBC

Table 1705A.6, Table 1705A.7, Table 1705A.8

Application Number: 02-122549	School Name: Villalovoz Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-05-06 21:37:49

	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	b. Determine capacities of test piles and conduct additional load tests as required.	Test	LOR*	* Under the supervision of the geotechnical engineer.
<input type="checkbox"/>	c. Inspect driving operations and maintain complete and accurate records for each pile.	Continuous	GE*	* By geotechnical engineer or his or her qualified representative.
<input type="checkbox"/>	d. Verify locations of piles and their plumbness, confirm type and size of hammer, record number of blows per foot of penetration, determine required penetrations to achieve design capacity, record tip and butt elevations and record any pile damage.	Continuous	GE*	* By geotechnical engineer or his or her qualified representative.
<input type="checkbox"/>	e. Steel piles.	Provide tests and inspections per STEEL section below.		
<input type="checkbox"/>	f. Concrete piles and concrete filled piles.	Provide tests and inspections per CONCRETE section below.		
<input type="checkbox"/>	g. For specialty piles, perform additional inspections as determined by the registered design professional in responsible charge.	*	*	* As defined on drawings or specifications.

	S4. CAST-IN-PLACE DEEP FOUNDATIONS (PIERS):			
	Test or Special Inspection	Type	Performed By	Code References and Note
<input checked="" type="checkbox"/>	a. Inspect drilling operations and maintain complete and accurate records for each pier.	Continuous	PI	Continuous inspection to be provided by project inspector. Refer to specific items identified in the Appendix listing exemptions for limitations.
<input checked="" type="checkbox"/>	b. Verify pier locations, diameters, plumbness and lengths. Record concrete or grout volumes.	Continuous	PI	Continuous inspection to be provided by project inspector. Refer to specific items identified in the Appendix listing exemptions for limitations.
<input checked="" type="checkbox"/>	c. Concrete piers.	Provide tests and inspections per CONCRETE section below.		

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (SOILS), 2022 CBC

Table 1705A.6, Table 1705A.7, Table 1705A.8

Application Number: 02-122549	School Name: Villalovoz Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-05-06 21:37:49

	Test or Special Inspection	Type	Performed By	Code References and Notes
	S5. RETAINING WALLS:			
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Placement, compaction and inspection of backfill.	Continuous	GE*	1705A.6.1. * By geotechnical engineer or his or her qualified representative. (See section S2 above).
<input type="checkbox"/>	b. Placement of soil reinforcement and/or drainage devices.	Continuous	GE*	* By geotechnical engineer or his or her qualified representative.
<input type="checkbox"/>	c. Segmental retaining walls; inspect placement of units, dowels, connectors, etc.	Continuous	GE*	* By geotechnical engineer or his or her qualified representative. See DSA IR 18-2.
<input type="checkbox"/>	d. Concrete retaining walls.	Provide tests and inspections per CONCRETE section below.		
<input type="checkbox"/>	e. Masonry retaining walls.	Provide tests and inspections per MASONRY section below.		

	S6. OTHER SOILS:			
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Soil Improvements	Test	GE*	Submit a comprehensive report documenting final soil improvements constructed, construction observation and the results of the confirmation testing and analysis to CGS (California Geological Survey) for final acceptance. * By geotechnical engineer or his or her qualified representative.
<input type="checkbox"/>	b. Inspection of Soil Improvements	Continuous	GE*	* By geotechnical engineer or his or her qualified representative.
<input type="checkbox"/>	c.			

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (CONCRETE), 2022 CBC

Table 1705A.3; ACI 318-19 Sections 26.12 & 26.13

Application Number: 02-122549	School Name: Villalovoz Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-05-06 21:37:49

C1. CAST-IN-PLACE CONCRETE				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input checked="" type="checkbox"/>	a. Verify use of required design mix.	Continuous	SI	Table 1705A.3 Item 5, 1910A.1.
<input checked="" type="checkbox"/>	b. Identify, sample, and test reinforcing steel.	Test	LOR	1910A.2; ACI 318-19 Ch.20 and Section 26.6.1.2; DSA IR 17-10. (See Appendix (end of this form) for exemptions.)
<input checked="" type="checkbox"/>	c. During concrete placement, fabricate specimens for strength tests, perform slump and air content tests, and determine the temperature of the concrete.	Test	LOR	Table 1705A.3 Item 6; ACI 318-19 Sections 26.5 & 26.12.
<input checked="" type="checkbox"/>	d. Test concrete (f'_c).	Test	LOR	1905A.1.17; ACI 318-19 Section 26.12.
<input checked="" type="checkbox"/>	e. Batch plant inspection:	See Notes	SI	Default of 'Continuous' per 1705A.3.3. If approved by DSA, batch plant inspection may be reduced to 'Periodic' subject to requirements in Section 1705A.3.3.1, or not required per 1705A.3.3.2. See IR 17-13. (See Appendix (end of this form) for exemptions.)
<input type="checkbox"/>	f. Welding of reinforcing steel.	Provide special inspection per STEEL, Category S/A4(d) & (e) and/or S/A5(g) & (h) below.		

C2. PRESTRESSED / POST-TENSIONED CONCRETE (IN ADDITION TO SECTION C1):				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Sample and test prestressing tendons and anchorages.	Test	LOR	1705A.3.4, 1910A.3
<input type="checkbox"/>	b. Inspect placement of prestressing tendons.	Periodic	SI	1705A.3.4, Table 1705A.3 Items 1 & 9.

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (CONCRETE), 2022 CBC

Table 1705A.3; ACI 318-19 Sections 26.12 & 26.13

Application Number: 02-122549	School Name: Villalovoz Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-05-06 21:37:49

	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	c. Verify in-situ concrete strength prior to stressing of post-tensioning tendons.	Periodic	SI	Table 1705A.3 Item 13. Special inspector to verify specified concrete strength test prior to stressing.
<input type="checkbox"/>	d. Inspect application of post-tensioning or prestressing forces and grouting of bonded prestressing tendons.	Continuous	SI	1705A.3.4, Table 1705A.3 Item 9; ACI 318-19 Section 26.13

	C3. PRECAST CONCRETE (IN ADDITION TO SECTION C1):			
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Inspect fabrication of precast concrete members.	Continuous	SI	ACI 318-19 Section 26.13, and PCI MNL-128 and -130.
<input type="checkbox"/>	b. Inspect erection of precast concrete members.	Periodic	SI*	Table 1705A.3 Item 10. * May be performed by PI when specifically approved by DSA.
<input type="checkbox"/>	c. For precast concrete diaphragm connections or reinforcement at joints classified as moderate or high deformability elements (MDE or HDE) in structures assigned to Seismic Design Category D, E or F, inspect such connections and reinforcement in the field for: 1. Installation of the embedded parts 2. Completion of the continuity of reinforcement across joints. 3. Completion of connections in the field.	Continuous	SI	Table 1705A.3; ACI 318-19 Section 26.13.1.3; ACI 550.5
<input type="checkbox"/>	d. Inspect installation tolerances of precast concrete diaphragm connections for compliance with ACI 550.5.	Periodic	SI	Table 1705A.3; ACI 318-19 Section 26.13.1.3; ACI 550.5

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (CONCRETE), 2022 CBC

Table 1705A.3; ACI 318-19 Sections 26.12 & 26.13

Application Number: 02-122549	School Name: Villalovoz Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-05-06 21:37:49

C4. SHOTCRETE (IN ADDITION TO SECTION C1):				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Inspect shotcrete placement for proper application techniques.	Continuous	SI	1705A.3.9, Table 1705A.3 Item 7, 1908A.1, 1908A.2, 1908A.3. See ACI 506.2-13 Section 3.4, ACI 506R-16.
<input type="checkbox"/>	b. Sample and test shotcrete (f'_c).	Test	LOR	1908A.2, 1705A.3.9

C5. POST-INSTALLED ANCHORS:				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Inspect installation of post-installed anchors	See Notes	SI*	1617A.1.19, Table 1705A.3 Item 4a (Continuous) & 4b (Periodic), 1705A.3.8 (See Appendix (end of this form) for exemptions). ACI 318-19 Section 26.13. * May be performed by the project inspector when specifically approved by DSA.
<input type="checkbox"/>	b. Test post-installed anchors.	Test	LOR	1910A.5. (See Appendix (end of this form) for exemptions.)

C6. OTHER CONCRETE:				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a.			

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (STEEL AND ALUMINUM), 2022 CBC

1705A.2.1, Table 1705A.2.1; AISC 303-16, AISC 341-16, AISC 358-16, AISC 360-16; AISI S100-20; RCSC 2014; AWS D1.1, AWS D1.2, AWS D1.3, AWS D1.4, AWS D1.8

Application Number: 02-122549	School Name: Villalovoz Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-05-06 21:37:49

S/A1. STRUCTURAL STEEL, COLD-FORMED STEEL AND ALUMINUM USED FOR STRUCTURAL PURPOSES				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input checked="" type="checkbox"/>	a. Verify identification of all materials and: • Mill certificates indicate material properties that comply with requirements. • Material sizes, types and grades comply with requirements.	Periodic	*	Table 1705A.2.1 Item 3a 3c. 2202A.1; AISI S100-20 Section A3.1 & A3.2, AISI S240-20 Section A3 & A5, AISI S220-20 Sections A4 & A6. * By special inspector or qualified technician when performed off-site.
<input checked="" type="checkbox"/>	b. Test unidentified materials	Test	LOR	2202A.1.
<input checked="" type="checkbox"/>	c. Examine seam welds of HSS shapes	Periodic	SI	DSA IR 17-3.
<input checked="" type="checkbox"/>	d. Verify and document steel fabrication per DSA-approved construction documents.	Periodic	SI	Not applicable to cold-formed steel light-frame construction, except for trusses (1705A.2.4).
<input type="checkbox"/>	e. Buckling restrained braces.	Test	LOR	Testing and special inspections in accordance with IR 22-4.

S/A2. HIGH-STRENGTH BOLTS:				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input checked="" type="checkbox"/>	a. Verify identification markings and manufacturer's certificates of compliance conform to ASTM standards specified in the DSA-approved documents.	Periodic	SI	Table 1705A.2.1 Items 1a & 1b, 2202A.1; AISC 360-16 Section A3.3, J3.1, and N3.2; RCSC 2014 Section 1.5 & 2.1; DSA IR 17-8 & DSA IR 17-9.
<input checked="" type="checkbox"/>	b. Test high-strength bolts, nuts and washers.	Test	LOR	Table 1705A.2.1 Item 1c, 2213A.1; RCSC 2014 Section 7.2; DSA IR 17-8.
<input checked="" type="checkbox"/>	c. Bearing-type ("snug tight") connections.	Periodic	SI	Table 1705A.2.1 Item 2a, 1705A.2.6, 2204A.2; AISC 360-16 J3.1, J3.2, M2.5 & N5.6; RCSC 2014 Section 9.1; DSA IR 17-9.
<input checked="" type="checkbox"/>	d. Pretensioned and slip-critical connections.	*	SI	Table 1705A.2.1 Items 2b & 2c, 1705A.2.6, 2204A.2; AISC 360-16 J3.1, J3.2, M2.5 & N5.6; RCSC 2014 Sections 9.2 & 9.3; DSA IR 17-9. **"Continuous" or "Periodic" depends on the tightening method used.

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (STEEL AND ALUMNINUM), 2022 CBC

1705A.2.1, Table 1705A.2.1; AISC 303-16, AISC 341-16, AISC 358-16, AISC 360-16; AISI S100-20; RCSC 2014; AWS D1.1, AWS D1.2, AWS D1.3, AWS D1.4, AWS D1.8

Application Number: 02-122549	School Name: Villalovoz Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-05-06 21:37:49

S/A3. WELDING:				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input checked="" type="checkbox"/>	a. Verify weld filler material identification markings per AWS designation listed on the DSA-approved documents and the WPS.	Periodic	SI	1705A.2.5, Table 1705A.2.1 Items 4 & 5; AWS D1.1 and AWS D1.8 for structural steel; AWS D1.2 for Aluminum; AWS D1.3 for cold-formed steel; AWS D1.4 for reinforcing steel; DSA IR 17-3.
<input checked="" type="checkbox"/>	b. Verify weld filler material manufacturer's certificate of compliance.	Periodic	SI	DSA IR 17-3.
<input checked="" type="checkbox"/>	c. Verify WPS, welder qualifications and equipment.	Periodic	SI	DSA IR 17-3.

S/A4. SHOP WELDING (IN ADDITION TO SECTION S/A3):				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input checked="" type="checkbox"/>	a. Inspect groove welds, multi-pass fillet welds, single pass fillet welds > 5/16", plug and slot welds.	Continuous	SI	Table 1705A.2.1 Items 5a.1 4; AISC 360-16 (and AISC 341-16 as applicable); DSA IR 17-3.
<input checked="" type="checkbox"/>	b. Inspect single-pass fillet welds ≤ 5/16", floor and roof deck welds.	Periodic	SI	1705A.2.2, Table 1705A.2.1 Items 5a.5 & 5a.6; AISC 360-16 (and AISC 341-16 as applicable); DSA IR 17-3.
<input type="checkbox"/>	c. Inspect welding of stairs and railing systems.	Periodic	SI	1705A.2.1; AISC 360-16 (and AISC 341-16 as applicable); AWS D1.1 & D1.3; DSA IR 17-3.
<input type="checkbox"/>	d. Verification of reinforcing steel weldability other than ASTM A706.	Periodic	SI	1705A.3.1; AWS D1.4; DSA IR 17-3. Verify carbon equivalent reported on mill certificates.
<input type="checkbox"/>	e. Inspect welding of reinforcing steel.	Continuous	SI	Table 1705A.2.1 Item 5b, 1705A.3.1, Table 1705A.3 Item 2, 1903A.8; AWS D1.4; DSA IR 17-3.

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (STEEL AND ALUMNINUM), 2022 CBC

1705A.2.1, Table 1705A.2.1; AISC 303-16, AISC 341-16, AISC 358-16, AISC 360-16; AISI S100-20; RCSC 2014; AWS D1.1, AWS D1.2, AWS D1.3, AWS D1.4, AWS D1.8

Application Number: 02-122549	School Name: Villalovoz Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-05-06 21:37:49

	Test or Special Inspection	Type	Performed By	Code References and Notes
	S/A5. FIELD WELDING (IN ADDITION TO SECTION S/A3):			
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Inspect groove welds, multi-pass fillet welds, single pass fillet welds > 5/16", plug and slot welds.	Continuous	SI	Table 1705A.2.1 Items 5a.1 4; AISC 360-16 (AISC 341-16 as applicable); DSA IR 17-3.
<input type="checkbox"/>	b. Inspect single-pass fillet welds ≤ 5/16".	Periodic	SI	Table 1705A.2.1 Item 5a.5; AISC 360-16 (AISC 341-16 as applicable); DSA IR 17-3.
<input type="checkbox"/>	c. Inspect end-welded studs (ASTM A-108) installation (including bend test).	Periodic	SI	2213A.2; AISC 360-16 (AISC 341-16 as applicable); AWS D1.1; DSA IR 17-3.
<input type="checkbox"/>	d. Inspect floor and roof deck welds.	Periodic	SI	1705A.2.2, Table 1705A.2.1 Item 5a.6; AISC 360-16 (AISC 341-16 as applicable); AWS D1.3; DSA IR 17-3.
<input type="checkbox"/>	e. Inspect welding of structural cold-formed steel.	Periodic	SI*	1705A.2.5; AWS D1.3; DSA IR 17-3. The quality control provisions of AISI S240-20 Chapter D shall also apply. * May be performed by the project inspector when specifically approved by DSA.
<input type="checkbox"/>	f. Inspect welding of stairs and railing systems.	Periodic	SI*	1705A.2.1; AISC 360-16 (AISC 341-16 as applicable); AWS D1.1 & D1.3; DSA IR 17-3. * May be performed by the project inspector when specifically approved by DSA.
<input type="checkbox"/>	g. Verification of reinforcing steel weldability.	Periodic	SI	1705A.3.1; AWS D1.4; DSA IR 17-3. Verify carbon equivalent reported on mill certificates.
<input type="checkbox"/>	h. Inspect welding of reinforcing steel.	Continuous	SI	Table 1705A.2.1 Item 5b, 1705A.3.1, Table 1705A.3 Item 2, 1903A.8; AWS D1.4; DSA IR 17-3.

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (STEEL AND ALUMNINUM), 2022 CBC

1705A.2.1, Table 1705A.2.1; AISC 303-16, AISC 341-16, AISC 358-16, AISC 360-16; AISI S100-20; RCSC 2014; AWS D1.1, AWS D1.2, AWS D1.3, AWS D1.4, AWS D1.8

Application Number:

02-122549

School Name:

Villalovoz Elementary School

School District:

Tracy Unified School District

DSA File Number:

39-73

Increment Number:

Date Created:

2024-05-06 21:37:49

	Test or Special Inspection	Type	Performed By	Code References and Notes
	S/A6. NONDESTRUCTIVE TESTING:			
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Ultrasonic	Test	LOR	1705A.2.1, 1705A.2.5; AISC 341-16 J6.2, AISC 360-16 N5.5; AWS D1.1, AWS D1.8; DSA IR 17-2.
<input type="checkbox"/>	b. Magnetic Particle	Test	LOR	1705A.2.1, 1705A.2.5; AISC 341-16 J6.2, AISC 360-16 N5.5; AWS D1.1, AWS D1.8; DSA IR 17-2.
<input type="checkbox"/>	c.	Test	LOR	

	S/A7. STEEL JOISTS AND TRUSSES:			
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Verify size, type and grade for all chord and web members as well as connectors and weld filler material; verify joist profile, dimensions and camber (if applicable); verify all weld locations, lengths and profiles; mark or tag each joist.	Continuous	SI	1705A.2.3, Table 1705A.2.3; AWS D1.1; DSA IR 22-3 for steel joists only. 1705A.2.4; AWS D1.3 for cold-formed steel trusses.

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (STEEL AND ALUMNINUM), 2022 CBC

1705A.2.1, Table 1705A.2.1; AISC 303-16, AISC 341-16, AISC 358-16, AISC 360-16; AISI S100-20; RCSC 2014; AWS D1.1, AWS D1.2, AWS D1.3, AWS D1.4, AWS D1.8

Application Number: 02-122549	School Name: Villalovoz Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-05-06 21:37:49

	Test or Special Inspection	Type	Performed By	Code References and Notes
	S/A8. SPRAYED FIRE-RESISTANT MATERIALS:			
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Examine structural steel surface conditions, inspect application, take samples, measure thickness and verify compliance of all aspects of application with DSA-approved documents.	Periodic	SI	1705A.15, 1705A.15.1, 1705A.15.2, 1705A.15.3, 1705A.15.4, 1705A.15.5, 1705A.15.6.
<input type="checkbox"/>	b. Test density.	Test	LOR	1705A.15.1, 1705A.15.5, ASTM E605
<input type="checkbox"/>	c. Bond strength adhesion/cohesion.	Test	LOR	1705A.15.1, 1705A.15.6, ASTM E736

	S/A9. ANCHOR BOLTS AND ANCHOR RODS:			
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Anchor Bolts and Anchor Rods	Test	LOR	Identify, sample and test anchor bolts and anchor rods not meeting exemptions identified in Section 1 of IR 17-11.
<input type="checkbox"/>	b. Threaded rod not used for foundation anchorage.	Test	LOR	Identify, sample and test threaded rods not meeting exemptions identified in Section 1 of IR 17-11.

	S/A10. STORAGE RACK SYSTEMS:			
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Materials used, to verify compliance with one or more of the material test reports in accordance with the approved construction documents.	Periodic	SI	Table 1705A.13.7
<input type="checkbox"/>	b. Fabricated storage rack elements.	Periodic	SI	1704A.2.5; Table 1705A.13.7

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (STEEL AND ALUMNINUM), 2022 CBC

1705A.2.1, Table 1705A.2.1; AISC 303-16, AISC 341-16, AISC 358-16, AISC 360-16; AISI S100-20; RCSC 2014; AWS D1.1, AWS D1.2, AWS D1.3, AWS D1.4, AWS D1.8

Application Number: 02-122549	School Name: Villalovoz Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-05-06 21:37:49

	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	c. Storage rack anchorage installation.	Periodic	SI	ANSI/MH16.1 Section 7.3.2; Table 1705A.13.7
<input type="checkbox"/>	d. Completed storage rack system to indicate compliance with the approved construction documents.	Periodic	SI*	Table 1705A.13.7; * May be preformed by the project inspector when specifically approved by DSA.

	S/A11. Other Steel			
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a.			

Appendix: Work Exempt from DSA Requirements for Structural Tests / Special Inspections

Application Number: 02-122549	School Name: Villalovoz Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-05-06 21:37:49

Exempt items given in DSA IR A-22 or the 2022 CBC (including DSA amendments) and those items identified below with a check mark by the design professional are NOT subject to DSA requirements for the structural tests / special inspections noted. **Items marked as exempt shall be identified on the approved construction documents.** The project inspector shall verify all construction complies with the approved construction documents.

	SOILS:
<input type="checkbox"/>	1. Deep foundations acting as a cantilever footing with a design based on minimum allowable pressures per CBC Table 1806A.2 and without a geotechnical report for the following cases: A) free standing sign or scoreboard, B) cell or antenna towers and poles less than 35'-0" tall (e.g., lighting poles, flag poles, poles supporting open mesh fences, etc.), C) single-story structure with dead load less than 5 psf (e.g., open fabric shade structure), or D) covered walkway structure with an apex height less than 10'-0" above adjacent grade.
<input type="checkbox"/>	2. Shallow foundations, etc. are exempt from special inspections and testing by a Geotechnical Engineer for the following cases: A) buildings without a geotechnical report and meeting the exception item #1 criteria in CBC Section 1803A.2 supported by native soil (any excavation depth) or fill soil (not exceeding 12" depth per CBC Section 1804A.6), B) soil scarification/recompaction not exceeding 12" depth, C) native or fill soil supporting exterior non-structural flatwork (e.g., sidewalks, site concrete ramps, site stairs, parking lots, driveways, etc.), D) unpaved landscaping and playground areas, or E) utility trench backfill with depth not exceeding 12".

	CONCRETE/MASONRY:
<input type="checkbox"/>	1. Post-installed anchors for the following: A) exempt non-structural components (e.g., mechanical, electrical, plumbing equipment - see item 7 for "Welding" in the Appendix below) given in CBC Section 1617A.1.18 (which replaces ASCE 7-16, Section 13.1.4) or B) interior nonstructural wall partitions meeting criteria listed in exempt item 3 for "Welding" in the Appendix below
<input type="checkbox"/>	2. Concrete batch plant inspection is not required for items given in CBC Section 1705A.3.3.2 subject to the requirements and limitations in that section.
<input type="checkbox"/>	3. Non-bearing non-shear masonry walls may be exempt from certain DSA masonry testing and special inspection items as allowed per DSA IR 21-1. Refer to construction documents for specific exemptions accordingly for each applicable wall condition shown in Appendix A of IR 21-1.
<input type="checkbox"/>	4. Epoxy shear dowels in site flatwork and/or other non-structural concrete.

Appendix: Work Exempt from DSA Requirements for Structural Tests / Special Inspections

Application Number: 02-122549	School Name: Villalovoz Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-05-06 21:37:49

	CONCRETE/MASONRY:
<input type="checkbox"/>	5. Testing of reinforcing bars is not required for items given in CBC Section 1910A.2 subject to the requirements and limitations in that section.

	WELDING:
<input type="checkbox"/>	1. Solid-clad and open-mesh fences, gates with maximum leaf span of 10', and gates with a maximum rolling section of 10' all having an apex height less than 8'-0" above lowest adjacent grade. When located above circulation or occupied space below, these gates/fences are not located within 1.5x gate/fence height (max 8'-0") to the edge of floor or roof.
<input type="checkbox"/>	2. Handrails, guardrails, and modular or relocatable ramps associated with walking surfaces less than 30" above adjacent grade (excluding post base connections per the 'Exception' language in Section 1705A.2.1); fillet welds shall not be ground flush.
<input type="checkbox"/>	3. Non-structural interior cold-formed steel framing spanning less than 15'-0", such as in interior partitions, interior soffits, etc. supporting only self weight and light-weight finishes or adhered tile, masonry, stone, or terra cotta veneer no more than 5/8" thickness and apex less than 20'-0" in height and not over an exit way. Maximum tributary load to a member shall not exceed the equivalent of that occurring from a 10'x10' opening in a 15' tall wall for a header or king stud.
<input type="checkbox"/>	4. Manufactured support frames and curbs using hot rolled or cold-formed steel (i.e., light gauge) for mechanical, electrical, or plumbing equipment weighing less than 2000# (equipment only) (connections of such frames to superstructure elements using welding will require special inspection as noted in selected item(s) for Sections S/A3, S/A4 and/or S/A5 of listing above).
<input type="checkbox"/>	5. Manufactured components (e.g., Tolco, B-Line, Afcon, etc.) for mechanical, electrical, or plumbing hanger support and bracing (connections of such components to superstructure elements using welding will require special inspection as noted in selected item(s) for Sections S/A3, S/A4 and/or S/A5 of listing above).
<input type="checkbox"/>	6. TV Brackets, projector mounts with a valid listing (see DSA IR A-5) and recreational equipment (e.g., playground structures, basketball backstops, etc.) (connections of such elements to superstructure elements using welding will require special inspection as noted in selected item(s) for sections S/A3, S/A4 and/or S/A5 located in the Steel/Aluminum category of listing above).

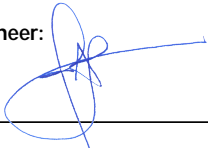
Appendix: Work Exempt from DSA Requirements for Structural Tests / Special Inspections

Application Number: 02-122549	School Name: Villalovoz Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-05-06 21:37:49

	WELDING:
<input type="checkbox"/>	7. Any support for exempt non-structural components given in CBC Section 1617A.1.18 (which replaces ASCE 7-16, Section 13.1.4) meeting the following: A) when supported on a floor/roof, <400# and resulting composite center of mass (including component's center of mass) ≤4' above supporting floor/roof, B) when hung from a wall or roof/floor, <20# for discrete units or <5 plf for distributed systems.

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS(SIGNATURE), 2022 CBC

Application Number: 02-122549	School Name: Villalovoz Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-05-06 21:37:49

Name of Architect or Engineer in general responsible charge: Jeffrey Grau	
Name of Structural Engineer (When structural design has been delegated): 	
Signature of Architect or Structural Engineer: 	Date: 05/09/24

Note: To facilitate DSA electronic mark-ups and identification stamp application, DSA recommends against using secured electronic or digital signatures.

DSA STAMP

DSA 103-22: LIST OF REQUIRED VERIFIED REPORTS, CBC 2022

Application Number: 02-122549	School Name: Villalovoz Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-05-06 21:37:49

1. Structural Testing and Inspection: Laboratory Verified Report Form DSA 291

2. Shop Welding Inspection: Laboratory Verified Report Form DSA 291, or, for independently contracting SI, Special Inspection Verified Report Form DSA 292

3. High-Strength Bolt Installation Inspection: Laboratory Verified Report Form DSA 291, or, for independently contracting SI, Special Inspection Verified Report Form DSA 292

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS, 2022 CBC

General

Application Number: 02-122546	School Name: Wanda Hirsch Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-05-06 21:40:19

IMPORTANT: This form is only a summary list of structural tests and some of the special inspections required for the project. Generally, the structural tests and special inspections noted on this form are those that will be performed by the Geotechnical Engineer of Record, Laboratory of Record, or Special Inspector. The actual complete test and inspection program must be performed as detailed on the DSA approved documents. The appendix at the bottom of this form identifies work NOT subject to DSA requirements for special inspection or structural testing. The project inspector is responsible for providing inspection of all facets of construction, including but not limited to, special inspections not listed on this form such as structural wood framing, high-load wood diaphragms, cold-formed steel framing, anchorage of non-structural components, etc., per Title 24, Part 2, Chapter 17A (2022 CBC).

****NOTE:** Undefined section and table references found in this document are from the CBC, or California Building Code.

KEY TO COLUMNS

1. TYPE	2. PERFORMED BY
Continuous – Indicates that a continuous special inspection is required	GE (Geotechnical Engineer) – Indicates that the special inspection shall be performed by a registered geotechnical engineer or his or her authorized representative.
Periodic – Indicates that a periodic special inspection is required	LOR (Laboratory of Record) – Indicates that the test or special inspection shall be performed by a testing laboratory accepted in the DSA Laboratory Evaluation and Acceptance (LEA) Program. See CAC Section 4-335.
Test – Indicates that a test is required	PI (Project Inspector) – Indicates that the special inspection may be performed by a project inspector when specifically approved by DSA.
	SI (Special Inspection) – Indicates that the special inspection shall be performed by an appropriately qualified/approved special inspector.

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (SOILS), 2022 CBC

Table 1705A.6, Table 1705A.7, Table 1705A.8

Application Number: 02-122546	School Name: Wanda Hirsch Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-05-06 21:40:19

Geotechnical Reports: Project does NOT have and does NOT require a geotechnical report

S1. GENERAL:				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input checked="" type="checkbox"/>	a. Verify that: <ul style="list-style-type: none">• Site has been prepared properly prior to placement of controlled fill and/or excavations for foundations.• Foundation excavations are extended to proper depth and have reached proper material.• Materials below footings must not contain loose material, mud, organic silt, organic clays, or peat.	See Notes	PI	Refer to specific items identified in the Appendix listing exemptions for limitations. Placement of controlled fill exceeding 12" depth under foundations and/or within the building envelope is not permitted without a geotechnical report.

S2. SOIL COMPACTION AND FILL:				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Perform classification and testing of fill materials.	Test	LOR*	* Under the supervision of the geotechnical engineer.
<input checked="" type="checkbox"/>	b. Verify use of proper materials, densities and inspect lift thicknesses, placement and compaction during placement of fill.	Continuous	LOR*	* Under the supervision of a geotechnical engineer or LOR's engineering manager. Refer to specific items identified in the Appendix listing exemptions for limitations.
<input checked="" type="checkbox"/>	c. Compaction testing.	Test	LOR*	* Under the supervision of a geotechnical engineer or LOR's engineering manager. Refer to specific items identified in the Appendix listing exemptions for limitations.

S3. DRIVEN DEEP FOUNDATIONS (PILES):				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Verify pile materials, sizes and lengths comply with the requirements.	Continuous	GE*	* By geotechnical engineer or his or her qualified representative.

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (SOILS), 2022 CBC

Table 1705A.6, Table 1705A.7, Table 1705A.8

Application Number: 02-122546	School Name: Wanda Hirsch Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-05-06 21:40:19

	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	b. Determine capacities of test piles and conduct additional load tests as required.	Test	LOR*	* Under the supervision of the geotechnical engineer.
<input type="checkbox"/>	c. Inspect driving operations and maintain complete and accurate records for each pile.	Continuous	GE*	* By geotechnical engineer or his or her qualified representative.
<input type="checkbox"/>	d. Verify locations of piles and their plumbness, confirm type and size of hammer, record number of blows per foot of penetration, determine required penetrations to achieve design capacity, record tip and butt elevations and record any pile damage.	Continuous	GE*	* By geotechnical engineer or his or her qualified representative.
<input type="checkbox"/>	e. Steel piles.	Provide tests and inspections per STEEL section below.		
<input type="checkbox"/>	f. Concrete piles and concrete filled piles.	Provide tests and inspections per CONCRETE section below.		
<input type="checkbox"/>	g. For specialty piles, perform additional inspections as determined by the registered design professional in responsible charge.	*	*	* As defined on drawings or specifications.

	S4. CAST-IN-PLACE DEEP FOUNDATIONS (PIERS):			
	Test or Special Inspection	Type	Performed By	Code References and Note
<input checked="" type="checkbox"/>	a. Inspect drilling operations and maintain complete and accurate records for each pier.	Continuous	PI	Continuous inspection to be provided by project inspector. Refer to specific items identified in the Appendix listing exemptions for limitations.
<input checked="" type="checkbox"/>	b. Verify pier locations, diameters, plumbness and lengths. Record concrete or grout volumes.	Continuous	PI	Continuous inspection to be provided by project inspector. Refer to specific items identified in the Appendix listing exemptions for limitations.
<input checked="" type="checkbox"/>	c. Concrete piers.	Provide tests and inspections per CONCRETE section below.		

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (SOILS), 2022 CBC

Table 1705A.6, Table 1705A.7, Table 1705A.8

Application Number: 02-122546	School Name: Wanda Hirsch Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-05-06 21:40:19

	Test or Special Inspection	Type	Performed By	Code References and Notes
	S5. RETAINING WALLS:			
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Placement, compaction and inspection of backfill.	Continuous	GE*	1705A.6.1. * By geotechnical engineer or his or her qualified representative. (See section S2 above).
<input type="checkbox"/>	b. Placement of soil reinforcement and/or drainage devices.	Continuous	GE*	* By geotechnical engineer or his or her qualified representative.
<input type="checkbox"/>	c. Segmental retaining walls; inspect placement of units, dowels, connectors, etc.	Continuous	GE*	* By geotechnical engineer or his or her qualified representative. See DSA IR 18-2.
<input type="checkbox"/>	d. Concrete retaining walls.	Provide tests and inspections per CONCRETE section below.		
<input type="checkbox"/>	e. Masonry retaining walls.	Provide tests and inspections per MASONRY section below.		

	S6. OTHER SOILS:			
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Soil Improvements	Test	GE*	Submit a comprehensive report documenting final soil improvements constructed, construction observation and the results of the confirmation testing and analysis to CGS (California Geological Survey) for final acceptance. * By geotechnical engineer or his or her qualified representative.
<input type="checkbox"/>	b. Inspection of Soil Improvements	Continuous	GE*	* By geotechnical engineer or his or her qualified representative.
<input type="checkbox"/>	c.			

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (CONCRETE), 2022 CBC

Table 1705A.3; ACI 318-19 Sections 26.12 & 26.13

Application Number: 02-122546	School Name: Wanda Hirsch Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-05-06 21:40:19

C1. CAST-IN-PLACE CONCRETE				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input checked="" type="checkbox"/>	a. Verify use of required design mix.	Continuous	SI	Table 1705A.3 Item 5, 1910A.1.
<input checked="" type="checkbox"/>	b. Identify, sample, and test reinforcing steel.	Test	LOR	1910A.2; ACI 318-19 Ch.20 and Section 26.6.1.2; DSA IR 17-10. (See Appendix (end of this form) for exemptions.)
<input checked="" type="checkbox"/>	c. During concrete placement, fabricate specimens for strength tests, perform slump and air content tests, and determine the temperature of the concrete.	Test	LOR	Table 1705A.3 Item 6; ACI 318-19 Sections 26.5 & 26.12.
<input checked="" type="checkbox"/>	d. Test concrete (f' _c).	Test	LOR	1905A.1.17; ACI 318-19 Section 26.12.
<input checked="" type="checkbox"/>	e. Batch plant inspection:	See Notes	SI	Default of 'Continuous' per 1705A.3.3. If approved by DSA, batch plant inspection may be reduced to 'Periodic' subject to requirements in Section 1705A.3.3.1, or not required per 1705A.3.3.2. See IR 17-13. (See Appendix (end of this form) for exemptions.)
<input type="checkbox"/>	f. Welding of reinforcing steel.	Provide special inspection per STEEL, Category S/A4(d) & (e) and/or S/A5(g) & (h) below.		

C2. PRESTRESSED / POST-TENSIONED CONCRETE (IN ADDITION TO SECTION C1):				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Sample and test prestressing tendons and anchorages.	Test	LOR	1705A.3.4, 1910A.3
<input type="checkbox"/>	b. Inspect placement of prestressing tendons.	Periodic	SI	1705A.3.4, Table 1705A.3 Items 1 & 9.

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (CONCRETE), 2022 CBC

Table 1705A.3; ACI 318-19 Sections 26.12 & 26.13

Application Number: 02-122546	School Name: Wanda Hirsch Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-05-06 21:40:19

	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	c. Verify in-situ concrete strength prior to stressing of post-tensioning tendons.	Periodic	SI	Table 1705A.3 Item 13. Special inspector to verify specified concrete strength test prior to stressing.
<input type="checkbox"/>	d. Inspect application of post-tensioning or prestressing forces and grouting of bonded prestressing tendons.	Continuous	SI	1705A.3.4, Table 1705A.3 Item 9; ACI 318-19 Section 26.13

	C3. PRECAST CONCRETE (IN ADDITION TO SECTION C1):			
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Inspect fabrication of precast concrete members.	Continuous	SI	ACI 318-19 Section 26.13, and PCI MNL-128 and -130.
<input type="checkbox"/>	b. Inspect erection of precast concrete members.	Periodic	SI*	Table 1705A.3 Item 10. * May be performed by PI when specifically approved by DSA.
<input type="checkbox"/>	c. For precast concrete diaphragm connections or reinforcement at joints classified as moderate or high deformability elements (MDE or HDE) in structures assigned to Seismic Design Category D, E or F, inspect such connections and reinforcement in the field for: 1. Installation of the embedded parts 2. Completion of the continuity of reinforcement across joints. 3. Completion of connections in the field.	Continuous	SI	Table 1705A.3; ACI 318-19 Section 26.13.1.3; ACI 550.5
<input type="checkbox"/>	d. Inspect installation tolerances of precast concrete diaphragm connections for compliance with ACI 550.5.	Periodic	SI	Table 1705A.3; ACI 318-19 Section 26.13.1.3; ACI 550.5

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (CONCRETE), 2022 CBC

Table 1705A.3; ACI 318-19 Sections 26.12 & 26.13

Application Number: 02-122546	School Name: Wanda Hirsch Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-05-06 21:40:19

C4. SHOTCRETE (IN ADDITION TO SECTION C1):				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Inspect shotcrete placement for proper application techniques.	Continuous	SI	1705A.3.9, Table 1705A.3 Item 7, 1908A.1, 1908A.2, 1908A.3. See ACI 506.2-13 Section 3.4, ACI 506R-16.
<input type="checkbox"/>	b. Sample and test shotcrete (f'_c).	Test	LOR	1908A.2, 1705A.3.9

C5. POST-INSTALLED ANCHORS:				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Inspect installation of post-installed anchors	See Notes	SI*	1617A.1.19, Table 1705A.3 Item 4a (Continuous) & 4b (Periodic), 1705A.3.8 (See Appendix (end of this form) for exemptions). ACI 318-19 Section 26.13. * May be performed by the project inspector when specifically approved by DSA.
<input type="checkbox"/>	b. Test post-installed anchors.	Test	LOR	1910A.5. (See Appendix (end of this form) for exemptions.)

C6. OTHER CONCRETE:				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a.			

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (STEEL AND ALUMINUM), 2022 CBC

1705A.2.1, Table 1705A.2.1; AISC 303-16, AISC 341-16, AISC 358-16, AISC 360-16; AISI S100-20; RCSC 2014; AWS D1.1, AWS D1.2, AWS D1.3, AWS D1.4, AWS D1.8

Application Number: 02-122546	School Name: Wanda Hirsch Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-05-06 21:40:19

S/A1. STRUCTURAL STEEL, COLD-FORMED STEEL AND ALUMINUM USED FOR STRUCTURAL PURPOSES				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input checked="" type="checkbox"/>	a. Verify identification of all materials and: • Mill certificates indicate material properties that comply with requirements. • Material sizes, types and grades comply with requirements.	Periodic	*	Table 1705A.2.1 Item 3a 3c. 2202A.1; AISI S100-20 Section A3.1 & A3.2, AISI S240-20 Section A3 & A5, AISI S220-20 Sections A4 & A6. * By special inspector or qualified technician when performed off-site.
<input checked="" type="checkbox"/>	b. Test unidentified materials	Test	LOR	2202A.1.
<input checked="" type="checkbox"/>	c. Examine seam welds of HSS shapes	Periodic	SI	DSA IR 17-3.
<input checked="" type="checkbox"/>	d. Verify and document steel fabrication per DSA-approved construction documents.	Periodic	SI	Not applicable to cold-formed steel light-frame construction, except for trusses (1705A.2.4).
<input type="checkbox"/>	e. Buckling restrained braces.	Test	LOR	Testing and special inspections in accordance with IR 22-4.

S/A2. HIGH-STRENGTH BOLTS:				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input checked="" type="checkbox"/>	a. Verify identification markings and manufacturer's certificates of compliance conform to ASTM standards specified in the DSA-approved documents.	Periodic	SI	Table 1705A.2.1 Items 1a & 1b, 2202A.1; AISC 360-16 Section A3.3, J3.1, and N3.2; RCSC 2014 Section 1.5 & 2.1; DSA IR 17-8 & DSA IR 17-9.
<input checked="" type="checkbox"/>	b. Test high-strength bolts, nuts and washers.	Test	LOR	Table 1705A.2.1 Item 1c, 2213A.1; RCSC 2014 Section 7.2; DSA IR 17-8.
<input checked="" type="checkbox"/>	c. Bearing-type ("snug tight") connections.	Periodic	SI	Table 1705A.2.1 Item 2a, 1705A.2.6, 2204A.2; AISC 360-16 J3.1, J3.2, M2.5 & N5.6; RCSC 2014 Section 9.1; DSA IR 17-9.
<input checked="" type="checkbox"/>	d. Pretensioned and slip-critical connections.	*	SI	Table 1705A.2.1 Items 2b & 2c, 1705A.2.6, 2204A.2; AISC 360-16 J3.1, J3.2, M2.5 & N5.6; RCSC 2014 Sections 9.2 & 9.3; DSA IR 17-9. **"Continuous" or "Periodic" depends on the tightening method used.

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (STEEL AND ALUMINUM), 2022 CBC

1705A.2.1, Table 1705A.2.1; AISC 303-16, AISC 341-16, AISC 358-16, AISC 360-16; AISI S100-20; RCSC 2014; AWS D1.1, AWS D1.2, AWS D1.3, AWS D1.4, AWS D1.8

Application Number: 02-122546	School Name: Wanda Hirsch Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-05-06 21:40:19

S/A3. WELDING:				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input checked="" type="checkbox"/>	a. Verify weld filler material identification markings per AWS designation listed on the DSA-approved documents and the WPS.	Periodic	SI	1705A.2.5, Table 1705A.2.1 Items 4 & 5; AWS D1.1 and AWS D1.8 for structural steel; AWS D1.2 for Aluminum; AWS D1.3 for cold-formed steel; AWS D1.4 for reinforcing steel; DSA IR 17-3.
<input checked="" type="checkbox"/>	b. Verify weld filler material manufacturer's certificate of compliance.	Periodic	SI	DSA IR 17-3.
<input checked="" type="checkbox"/>	c. Verify WPS, welder qualifications and equipment.	Periodic	SI	DSA IR 17-3.

S/A4. SHOP WELDING (IN ADDITION TO SECTION S/A3):				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input checked="" type="checkbox"/>	a. Inspect groove welds, multi-pass fillet welds, single pass fillet welds > 5/16", plug and slot welds.	Continuous	SI	Table 1705A.2.1 Items 5a.1 4; AISC 360-16 (and AISC 341-16 as applicable); DSA IR 17-3.
<input checked="" type="checkbox"/>	b. Inspect single-pass fillet welds ≤ 5/16", floor and roof deck welds.	Periodic	SI	1705A.2.2, Table 1705A.2.1 Items 5a.5 & 5a.6; AISC 360-16 (and AISC 341-16 as applicable); DSA IR 17-3.
<input type="checkbox"/>	c. Inspect welding of stairs and railing systems.	Periodic	SI	1705A.2.1; AISC 360-16 (and AISC 341-16 as applicable); AWS D1.1 & D1.3; DSA IR 17-3.
<input type="checkbox"/>	d. Verification of reinforcing steel weldability other than ASTM A706.	Periodic	SI	1705A.3.1; AWS D1.4; DSA IR 17-3. Verify carbon equivalent reported on mill certificates.
<input type="checkbox"/>	e. Inspect welding of reinforcing steel.	Continuous	SI	Table 1705A.2.1 Item 5b, 1705A.3.1, Table 1705A.3 Item 2, 1903A.8; AWS D1.4; DSA IR 17-3.

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (STEEL AND ALUMNINUM), 2022 CBC

1705A.2.1, Table 1705A.2.1; AISC 303-16, AISC 341-16, AISC 358-16, AISC 360-16; AISI S100-20; RCSC 2014; AWS D1.1, AWS D1.2, AWS D1.3, AWS D1.4, AWS D1.8

Application Number: 02-122546	School Name: Wanda Hirsch Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-05-06 21:40:19

	Test or Special Inspection	Type	Performed By	Code References and Notes
	S/A5. FIELD WELDING (IN ADDITION TO SECTION S/A3):			
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Inspect groove welds, multi-pass fillet welds, single pass fillet welds > 5/16", plug and slot welds.	Continuous	SI	Table 1705A.2.1 Items 5a.1 4; AISC 360-16 (AISC 341-16 as applicable); DSA IR 17-3.
<input type="checkbox"/>	b. Inspect single-pass fillet welds ≤ 5/16".	Periodic	SI	Table 1705A.2.1 Item 5a.5; AISC 360-16 (AISC 341-16 as applicable); DSA IR 17-3.
<input type="checkbox"/>	c. Inspect end-welded studs (ASTM A-108) installation (including bend test).	Periodic	SI	2213A.2; AISC 360-16 (AISC 341-16 as applicable); AWS D1.1; DSA IR 17-3.
<input type="checkbox"/>	d. Inspect floor and roof deck welds.	Periodic	SI	1705A.2.2, Table 1705A.2.1 Item 5a.6; AISC 360-16 (AISC 341-16 as applicable); AWS D1.3; DSA IR 17-3.
<input type="checkbox"/>	e. Inspect welding of structural cold-formed steel.	Periodic	SI*	1705A.2.5; AWS D1.3; DSA IR 17-3. The quality control provisions of AISI S240-20 Chapter D shall also apply. * May be performed by the project inspector when specifically approved by DSA.
<input type="checkbox"/>	f. Inspect welding of stairs and railing systems.	Periodic	SI*	1705A.2.1; AISC 360-16 (AISC 341-16 as applicable); AWS D1.1 & D1.3; DSA IR 17-3. * May be performed by the project inspector when specifically approved by DSA.
<input type="checkbox"/>	g. Verification of reinforcing steel weldability.	Periodic	SI	1705A.3.1; AWS D1.4; DSA IR 17-3. Verify carbon equivalent reported on mill certificates.
<input type="checkbox"/>	h. Inspect welding of reinforcing steel.	Continuous	SI	Table 1705A.2.1 Item 5b, 1705A.3.1, Table 1705A.3 Item 2, 1903A.8; AWS D1.4; DSA IR 17-3.

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (STEEL AND ALUMNINUM), 2022 CBC

1705A.2.1, Table 1705A.2.1; AISC 303-16, AISC 341-16, AISC 358-16, AISC 360-16; AISI S100-20; RCSC 2014; AWS D1.1, AWS D1.2, AWS D1.3, AWS D1.4, AWS D1.8

Application Number:

02-122546

School Name:

Wanda Hirsch Elementary School

School District:

Tracy Unified School District

DSA File Number:

39-73

Increment Number:

Date Created:

2024-05-06 21:40:19

	Test or Special Inspection	Type	Performed By	Code References and Notes
	S/A6. NONDESTRUCTIVE TESTING:			
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Ultrasonic	Test	LOR	1705A.2.1, 1705A.2.5; AISC 341-16 J6.2, AISC 360-16 N5.5; AWS D1.1, AWS D1.8; DSA IR 17-2.
<input type="checkbox"/>	b. Magnetic Particle	Test	LOR	1705A.2.1, 1705A.2.5; AISC 341-16 J6.2, AISC 360-16 N5.5; AWS D1.1, AWS D1.8; DSA IR 17-2.
<input type="checkbox"/>	c.	Test	LOR	

	S/A7. STEEL JOISTS AND TRUSSES:			
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Verify size, type and grade for all chord and web members as well as connectors and weld filler material; verify joist profile, dimensions and camber (if applicable); verify all weld locations, lengths and profiles; mark or tag each joist.	Continuous	SI	1705A.2.3, Table 1705A.2.3; AWS D1.1; DSA IR 22-3 for steel joists only. 1705A.2.4; AWS D1.3 for cold-formed steel trusses.

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (STEEL AND ALUMNINUM), 2022 CBC

1705A.2.1, Table 1705A.2.1; AISC 303-16, AISC 341-16, AISC 358-16, AISC 360-16; AISI S100-20; RCSC 2014; AWS D1.1, AWS D1.2, AWS D1.3, AWS D1.4, AWS D1.8

Application Number: 02-122546	School Name: Wanda Hirsch Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-05-06 21:40:19

	Test or Special Inspection	Type	Performed By	Code References and Notes
	S/A8. SPRAYED FIRE-RESISTANT MATERIALS:			
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Examine structural steel surface conditions, inspect application, take samples, measure thickness and verify compliance of all aspects of application with DSA-approved documents.	Periodic	SI	1705A.15, 1705A.15.1, 1705A.15.2, 1705A.15.3, 1705A.15.4, 1705A.15.5, 1705A.15.6.
<input type="checkbox"/>	b. Test density.	Test	LOR	1705A.15.1, 1705A.15.5, ASTM E605
<input type="checkbox"/>	c. Bond strength adhesion/cohesion.	Test	LOR	1705A.15.1, 1705A.15.6, ASTM E736

	S/A9. ANCHOR BOLTS AND ANCHOR RODS:			
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Anchor Bolts and Anchor Rods	Test	LOR	Identify, sample and test anchor bolts and anchor rods not meeting exemptions identified in Section 1 of IR 17-11.
<input type="checkbox"/>	b. Threaded rod not used for foundation anchorage.	Test	LOR	Identify, sample and test threaded rods not meeting exemptions identified in Section 1 of IR 17-11.

	S/A10. STORAGE RACK SYSTEMS:			
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Materials used, to verify compliance with one or more of the material test reports in accordance with the approved construction documents.	Periodic	SI	Table 1705A.13.7
<input type="checkbox"/>	b. Fabricated storage rack elements.	Periodic	SI	1704A.2.5; Table 1705A.13.7

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (STEEL AND ALUMNINUM), 2022 CBC

1705A.2.1, Table 1705A.2.1; AISC 303-16, AISC 341-16, AISC 358-16, AISC 360-16; AISI S100-20; RCSC 2014; AWS D1.1, AWS D1.2, AWS D1.3, AWS D1.4, AWS D1.8

Application Number: 02-122546	School Name: Wanda Hirsch Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-05-06 21:40:19

	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	c. Storage rack anchorage installation.	Periodic	SI	ANSI/MH16.1 Section 7.3.2; Table 1705A.13.7
<input type="checkbox"/>	d. Completed storage rack system to indicate compliance with the approved construction documents.	Periodic	SI*	Table 1705A.13.7; * May be preformed by the project inspector when specifically approved by DSA.

	S/A11. Other Steel			
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a.			

Appendix: Work Exempt from DSA Requirements for Structural Tests / Special Inspections

Application Number: 02-122546	School Name: Wanda Hirsch Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-05-06 21:40:19

Exempt items given in DSA IR A-22 or the 2022 CBC (including DSA amendments) and those items identified below with a check mark by the design professional are NOT subject to DSA requirements for the structural tests / special inspections noted. **Items marked as exempt shall be identified on the approved construction documents.** The project inspector shall verify all construction complies with the approved construction documents.

	SOILS:
<input type="checkbox"/>	1. Deep foundations acting as a cantilever footing with a design based on minimum allowable pressures per CBC Table 1806A.2 and without a geotechnical report for the following cases: A) free standing sign or scoreboard, B) cell or antenna towers and poles less than 35'-0" tall (e.g., lighting poles, flag poles, poles supporting open mesh fences, etc.), C) single-story structure with dead load less than 5 psf (e.g., open fabric shade structure), or D) covered walkway structure with an apex height less than 10'-0" above adjacent grade.
<input type="checkbox"/>	2. Shallow foundations, etc. are exempt from special inspections and testing by a Geotechnical Engineer for the following cases: A) buildings without a geotechnical report and meeting the exception item #1 criteria in CBC Section 1803A.2 supported by native soil (any excavation depth) or fill soil (not exceeding 12" depth per CBC Section 1804A.6), B) soil scarification/recompaction not exceeding 12" depth, C) native or fill soil supporting exterior non-structural flatwork (e.g., sidewalks, site concrete ramps, site stairs, parking lots, driveways, etc.), D) unpaved landscaping and playground areas, or E) utility trench backfill with depth not exceeding 12".

	CONCRETE/MASONRY:
<input type="checkbox"/>	1. Post-installed anchors for the following: A) exempt non-structural components (e.g., mechanical, electrical, plumbing equipment - see item 7 for "Welding" in the Appendix below) given in CBC Section 1617A.1.18 (which replaces ASCE 7-16, Section 13.1.4) or B) interior nonstructural wall partitions meeting criteria listed in exempt item 3 for "Welding" in the Appendix below
<input type="checkbox"/>	2. Concrete batch plant inspection is not required for items given in CBC Section 1705A.3.3.2 subject to the requirements and limitations in that section.
<input type="checkbox"/>	3. Non-bearing non-shear masonry walls may be exempt from certain DSA masonry testing and special inspection items as allowed per DSA IR 21-1. Refer to construction documents for specific exemptions accordingly for each applicable wall condition shown in Appendix A of IR 21-1.
<input type="checkbox"/>	4. Epoxy shear dowels in site flatwork and/or other non-structural concrete.

Appendix: Work Exempt from DSA Requirements for Structural Tests / Special Inspections

Application Number: 02-122546	School Name: Wanda Hirsch Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-05-06 21:40:19

	CONCRETE/MASONRY:
<input type="checkbox"/>	5. Testing of reinforcing bars is not required for items given in CBC Section 1910A.2 subject to the requirements and limitations in that section.

	WELDING:
<input type="checkbox"/>	1. Solid-clad and open-mesh fences, gates with maximum leaf span of 10', and gates with a maximum rolling section of 10' all having an apex height less than 8'-0" above lowest adjacent grade. When located above circulation or occupied space below, these gates/fences are not located within 1.5x gate/fence height (max 8'-0") to the edge of floor or roof.
<input type="checkbox"/>	2. Handrails, guardrails, and modular or relocatable ramps associated with walking surfaces less than 30" above adjacent grade (excluding post base connections per the 'Exception' language in Section 1705A.2.1); fillet welds shall not be ground flush.
<input type="checkbox"/>	3. Non-structural interior cold-formed steel framing spanning less than 15'-0", such as in interior partitions, interior soffits, etc. supporting only self weight and light-weight finishes or adhered tile, masonry, stone, or terra cotta veneer no more than 5/8" thickness and apex less than 20'-0" in height and not over an exit way. Maximum tributary load to a member shall not exceed the equivalent of that occurring from a 10'x10' opening in a 15' tall wall for a header or king stud.
<input type="checkbox"/>	4. Manufactured support frames and curbs using hot rolled or cold-formed steel (i.e., light gauge) for mechanical, electrical, or plumbing equipment weighing less than 2000# (equipment only) (connections of such frames to superstructure elements using welding will require special inspection as noted in selected item(s) for Sections S/A3, S/A4 and/or S/A5 of listing above).
<input type="checkbox"/>	5. Manufactured components (e.g., Tolco, B-Line, Afcon, etc.) for mechanical, electrical, or plumbing hanger support and bracing (connections of such components to superstructure elements using welding will require special inspection as noted in selected item(s) for Sections S/A3, S/A4 and/or S/A5 of listing above).
<input type="checkbox"/>	6. TV Brackets, projector mounts with a valid listing (see DSA IR A-5) and recreational equipment (e.g., playground structures, basketball backstops, etc.) (connections of such elements to superstructure elements using welding will require special inspection as noted in selected item(s) for sections S/A3, S/A4 and/or S/A5 located in the Steel/Aluminum category of listing above).

Appendix: Work Exempt from DSA Requirements for Structural Tests / Special Inspections

Application Number: 02-122546	School Name: Wanda Hirsch Elementary School	School District: Tracy Unified School District
DSA File Number: 39-73	Increment Number:	Date Created: 2024-05-06 21:40:19

	WELDING:
<input type="checkbox"/>	7. Any support for exempt non-structural components given in CBC Section 1617A.1.18 (which replaces ASCE 7-16, Section 13.1.4) meeting the following: A) when supported on a floor/roof, <400# and resulting composite center of mass (including component's center of mass) $\leq 4'$ above supporting floor/roof, B) when hung from a wall or roof/floor, <20# for discrete units or <5 plf for distributed systems.

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS(SIGNATURE), 2022 CBC

Application Number:

02-122546

School Name:

Wanda Hirsch Elementary School

School District:

Tracy Unified School District

DSA File Number:

39-73

Increment Number:

Date Created:

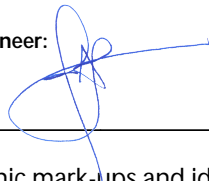
2024-05-06 21:40:19

Name of Architect or Engineer in general responsible charge:

Jeffrey Grau

Name of Structural Engineer (When structural design has been delegated):

Signature of Architect or Structural Engineer:



Date:

05/09/24

Note: To facilitate DSA electronic mark-ups and identification stamp application, DSA recommends against using secured electronic or digital signatures.

DSA STAMP

DSA 103-22: LIST OF REQUIRED VERIFIED REPORTS, CBC 2022

Application Number:

02-122546

School Name:

Wanda Hirsch Elementary School

School District:

Tracy Unified School District

DSA File Number:

39-73

Increment Number:**Date Created:**

2024-05-06 21:40:19

1. Structural Testing and Inspection: Laboratory Verified Report Form DSA 291

2. Shop Welding Inspection: Laboratory Verified Report Form DSA 291, or, for independently contracting SI, Special Inspection Verified Report Form DSA 292

3. High-Strength Bolt Installation Inspection: Laboratory Verified Report Form DSA 291, or, for independently contracting SI, Special Inspection Verified Report Form DSA 292

**Art Freiler Elementary School - TK
Portable Classroom Building**

2421 W. Lowell Ave., Tracy, CA 95377

3595001

Tracy Unified School District

1875 W Lowell Ave., Tracy, CA 95376



April 04, 2024

Art Freiler Elementary School - TK Portable Classroom Building
Tracy Unified School District
Tracy, California

February 28, 2024

HMC # 3595001

DSA Appl. #02-122126
DSA File #39-73

IDENTIFICATION STAMP
DIV. OF THE STATE ARCHITECT

APP: 02-121126 INC:

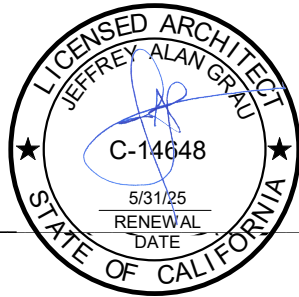
REVIEWED FOR

SS ☒

FLS ☒

ACS ☒

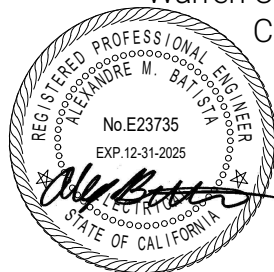
DATE: 04/17/2024



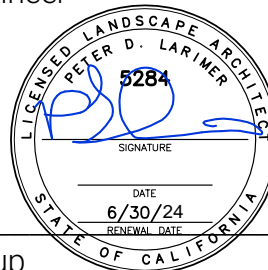
HMC ARCHITECTS
Architect



Warren Consulting Engineers
Civil Engineer



Optimized Energy & Facilities Consulting
Electrical Engineer



MTW Group
Landscape Architect

TABLE OF CONTENTS

DIVISION 00 - PROCUREMENT AND CONTRACTING REQUIREMENTS - NOT USED

DIVISION 01 - GENERAL REQUIREMENTS

SECTION	01 1100 - Summary of Work
	01 2513 - Product Options and Substitutions
	01 2600 - Changes in the Work
	01 2900 - Application for Payment and Conditional and Unconditional Waiver and Release Forms
	01 3119 - Project Meetings
	01 3213 - Scheduling of Work
	01 3300 - Submittal Procedures (Including Submittal Transmittal, Substitution Request, RFI, Electronic Data Request, Megger Grounding Test Certificate, Certification of Chlorination and Sterilization, Certification of Compliance for Building Materials)
	01 3513.23 - Site Standards
	01 3543 - Environmental Procedures
	01 4100 - Regulatory Requirements
	01 4213 - Abbreviations and Acronyms
	01 4216 - Definitions
	01 4219 - References
	01 4300 - Materials and Equipment
	01 4500 - Quality Control
	01 4523 - Testing and Inspection Services
	01 5000 - Temporary Facilities and Controls
	01 5013 - Construction Waste Management and Disposal
	01 5213 - Field Offices
	01 6116 - Volatile Organic Compound (VOC) Restrictions
	01 6600 - Product Delivery Storage and Handling
	01 7329 - Cutting and Patching
	01 7600 - Alteration Project Procedures
	01 7700 - Contract Closeout and Final Cleaning
	01 7823 - Operation and Maintenance Data
	01 7836 - Warranties (Including Contractor Standard Warranty Form, Subcontractor Standard Warranty Form, Special Extended Warranty Form)
	01 7839 - Record Documents
	01 8113.10 - Sustainable Design Requirements

DIVISION 02 - EXISTING CONDITIONS - NOT USED

DIVISION 03 - CONCRETE - NOT USED

DIVISION 04 - MASONRY - NOT USED

DIVISION 05 - METALS - NOT USED

DIVISION 06 - WOOD, PLASTICS, AND COMPOSITES - NOT USED

DIVISION 07 - THERMAL AND MOISTURE PROTECTION

SECTION	07 9200 - Joint Sealants
---------	--------------------------

DIVISION 08 - OPENINGS - NOT USED

DIVISION 09 - FINISHES

SECTION	09 9100 - Painting
---------	--------------------

TABLE OF CONTENTS

DIVISION 10 - SPECIALTIES

SECTION	10 1116 - Markerboards
	10 1400 - Signage
	10 2813 - Toilet Accessories
	10 4416 - Fire Extinguishers and Cabinets

DIVISION 11 - EQUIPMENT - NOT USED

DIVISION 12 - FURNISHINGS

SECTION	12 2113 - Horizontal Louver Blinds
	12 3216 - Manufactured Plastic-Laminate-Clad Casework
	12 3623 - Plastic-Laminate-Clad Countertops

DIVISION 13 - SPECIAL CONSTRUCTION - NOT USED

DIVISION 14 - CONVEYING EQUIPMENT - NOT USED

DIVISION 21 - FIRE SUPPRESSION - NOT USED

DIVISION 22 - PLUMBING - NOT USED

DIVISION 23 - HEATING, VENTILATING AND AIR CONDITIONING (HVAC) - NOT USED

DIVISION 26 - ELECTRICAL

SECTION	26 0100 - Electrical Basic Requirements
	26 0533 - Raceway and Boxes for Electrical Systems
	26 2716 - Cabinets and Enclosures
	26 2800 - Circuit Protective Devices
	26 6116 - Fire Alarm

DIVISION 27 - COMMUNICATIONS

SECTION	27 1000 - Data Communications
	27 5123 - Sound and Communications

DIVISION 28 - ELECTRONIC SAFETY AND SECURITY

SECTION	28 3100 - Intrusion Alarm System
---------	----------------------------------

DIVISION 31 - EARTHWORK

SECTION	31 0000 - Earthwork
	31 2333 - Trenching and Backfilling

DIVISION 32 - EXTERIOR IMPROVEMENTS

SECTION	32 1200 - Asphalt Concrete Paving
	32 1600 - Site Concrete
	32 3113 - Chain Link Fences and Gates
	32 8000 - Irrigation
	32 9000 - Landscaping

TABLE OF CONTENTS

DIVISION 33 - UTILITIES

SECTION	33 0000 - Utilities
	33 4000 - Storm Drainage Utilities

"All rights reserved. This Project Manual or any part hereof may not be duplicated without the written consent of Rainforth Grau Architects except in the form of excerpts or quotations for the purpose of review."

SUMMARY OF WORK

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Site Access Conditions and Requirements;
- B. Special Conditions.

1.02 SUMMARY OF WORK COVERED BY CONTRACT DOCUMENTS

- A. The Work of this Contract consists of the following at Art Freiler Elementary School:
 - (1) Selective demolition and construction for preparation of the site to receive 1 - 36'x40' relocatable building, including associated civil, architectural and electrical work as indicated in the drawings.

1.03 CONTRACTS

- A. Perform the Work under a single, fixed-price Contract.

1.04 WORK BY OTHERS

- A. Construction of 1 - 36'x40' classroom building by portable manufacturer

1.05 CODES, REGULATIONS, AND STANDARDS

- A. The codes, regulations, and standards adopted by the state and federal agencies having jurisdiction shall govern minimum requirements for this Project. Where codes, regulations, and standards conflict with the Contract Documents, these conflicts shall be brought to the immediate attention of the District and the Architect.
- B. Codes, regulations, and standards shall be as published effective as of date of bid opening, unless otherwise specified or indicated.

1.06 PROJECT RECORD DOCUMENTS

- A. Contractor shall maintain on Site one set of the following record documents; Contractor shall record actual revisions to the Work:
 - (1) Contract Drawings.
 - (2) Specifications.

- (3) Addenda.
 - (4) Change Orders and other modifications to the Contract.
 - (5) Reviewed shop drawings, product data, and samples.
 - (6) Field test records.
 - (7) Inspection certificates.
 - (8) Manufacturer's certificates.
- B. Contractor shall store Record Documents separate from documents used for construction. Provide files, racks, and secure storage for Record Documents and samples.
 - C. Contractor shall record information concurrent with construction progress.
 - D. Specifications: Contractor shall legibly mark and record at each product section of the Specifications the description of the actual product(s) installed, including the following:
 - (1) Manufacturer's name and product model and number.
 - (2) Product substitutions or alternates utilized.
 - (3) Changes made by Addenda and Change Orders and written directives.

1.07 EXAMINATION OF EXISTING CONDITIONS

- A. Contractor shall be held to have examined the Project Site and acquainted itself with the conditions of the Site and of the streets or roads approaching the Site.
- B. Prior to commencement of Work, Contractor shall survey the Site and existing buildings and improvements to observe existing damage and defects such as cracks, sags, broken, missing or damaged glazing, other building elements and Site improvements, and other damage.
- C. Should Contractor observe cracks, sags, and other damage to and defects of the Site and adjacent buildings, paving, and other items not indicated in the Contract Documents, Contractor shall immediately report same to the District and the Architect.

1.08 CONTRACTOR'S USE OF PREMISES

- A. If unoccupied and only with District's prior written approval, Contractor may use the building(s) at the Project Site without limitation for its operations, storage, and office facilities for the performance of the Work. If the District chooses to beneficially occupy any building(s), Contractor must obtain the District's written approval for Contractor's use of spaces and types of operations to be performed within the building(s) while so occupied. Contractor's access to the building(s) shall be limited to the areas indicated.

- B. If the space at the Project Site is not sufficient for Contractor's operations, storage, office facilities and/or parking, Contractor shall arrange and pay for any additional facilities needed by Contractor.
- C. Contractor shall not interfere with use of or access to occupied portions of the building(s) or adjacent property.
- D. Contractor shall maintain corridors, stairs, halls, and other exit-ways of building clear and free of debris and obstructions at all times.
- E. No one other than those directly involved in the demolition and construction, or specifically designated by the District or the Architect shall be permitted in the areas of work during demolition and construction activities.
- F. The Contractor shall install the construction fence and maintain that it will be locked when not in use. Keys to this fencing will be provided to the District.

1.09 PROTECTION OF EXISTING STRUCTURES AND UTILITIES

- A. The Drawings show above-grade and below-grade structures, utility lines, and other installations that are known or believed to exist in the area of the Work. Contractor shall locate these existing installations before proceeding with excavation and other operations that could damage same; maintain them in service, where appropriate; and repair damage to them caused by the performance of the Work. Should damage occur to these existing installations, the costs of repair shall be at the Contractor's expense and made to the District's satisfaction.
- B. Contractor shall be alert to the possibility of the existence of additional structures and utilities. If Contractor encounters additional structures and utilities, Contractor will immediately report to the District for disposition of same as indicated in the General Conditions.

1.10 UTILITY SHUTDOWNS AND INTERRUPTIONS

- A. Contractor shall give the District a minimum of three (3) days written notice in advance of any need to shut off existing utility services or to effect equipment interruptions. The District will set exact time and duration for shutdown, and will assist Contractor with shutdown. Work required to re-establish utility services shall be performed by the Contractor.
- B. Contractor shall obtain District's written approval as indicated in the General Conditions in advance of deliveries of material or equipment or other activities that may conflict with District's use of the building(s) or adjacent facilities.

1.11 STRUCTURAL INTEGRITY

- A. Contractor shall be responsible for and supervise each operation and work that could affect structural integrity of various building elements, both permanent and temporary.
- B. Contractor shall include structural connections and fastenings as indicated or required for complete performance of the Work.

PART 2 – PRODUCTS Not Used.

PART 3 – EXECUTION Not Used.

END OF DOCUMENT

PRODUCT OPTIONS AND SUBSTITUTIONS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. Instructions to Bidders;
- B. General Conditions, including, without limitation, Substitutions For Specified Items; and
- C. Special Conditions.

1.02 SUBSTITUTIONS OF MATERIALS AND EQUIPMENT

- A. Catalog numbers and specific brands or trade names followed by the designation "or equal" are used in conjunction with material and equipment required by the Specifications to establish the standards of quality, utility, and appearance required. Substitutions which are equal in quality, utility, and appearance to those specified may be reviewed subject to the provisions of the General Conditions.
- B. Wherever more than one manufacturer's product is specified, the first-named product is the basis for the design used in the work and the use of alternative-named manufacturers' products or substitutes may require modifications in that design. If such alternatives are proposed by Contractor and are approved by the District and/or the Architect, Contractor shall assume all costs required to make necessary revisions and modifications of the design resulting from the substitutions requested by the Contractor.
- C. When materials and equipment are specified by first manufacturer's name and product number, second manufacturer's name and "or approved equal," supporting data for the second product, if proposed by Contractor, shall be submitted in accordance with the requirements for substitutions. The District's Board has found and determined that certain item(s) shall be used on this Project based on the purpose(s) indicated pursuant to Public Contract Code section 3400(c). These findings, as well as the products and brand or trade names, have been identified in the Notice to Bidders.
- D. The Contractor will not be allowed to substitute specified items unless the request for substitution is submitted as follows:
 - (1) District must receive any notice of request for substitution of a specified item a minimum of ten (10) calendar days prior to bid opening.

- (2) Within 35 days after the date of the Notice of Award, the Contractor shall submit data substantiating the request(s) for all substitution(s) containing sufficient information to assess acceptability of product or system and impact on Project, including, without limitation, the requirements specified in the Special Conditions and the technical Specifications. Insufficient information shall be grounds for rejection of substitution.
- E. If the District and/or Architect, in reviewing proposed substitute materials and equipment, require revisions or corrections to be made to previously accepted Shop Drawings and supplemental supporting data to be resubmitted, Contractor shall promptly do so. If any proposed substitution is judged by the District and/or Architect to be unacceptable, the specified material or equipment shall be provided.
- F. Samples may be required. Tests required by the District and/or Architect for the determination of quality and utility shall be made at the expense of Contractor, with acceptance of the test procedure first given by the District.
- G. In reviewing the supporting data submitted for substitutions, the District and/or Architect will use for purposes of comparison all the characteristics of the specified material or equipment as they appear in the manufacturer's published data even though all the characteristics may not have been particularly mentioned in the Contract Documents. If more than two (2) submissions of supporting data are required, the cost of reviewing the additional supporting data shall be borne by Contractor, and the District will deduct the costs from the Contract Price. The Contractor shall be responsible for any re-design costs occasioned by District's acceptance and/or approval of any substitute.
- H. The Contractor shall, in the event that a substitute is less costly than that specified, credit the District with one hundred percent (100%) of the net difference between the substitute and the originally specified material. In this event, the Contractor agrees to execute a deductive Change Order to reflect that credit. In the event Contractor furnishes a material, process, or article more expensive than that specified, the difference in the cost of that material, process, or article so furnished shall be borne by Contractor.
- I. In no event shall the District be liable for any increase in Contract Price or Contract Time due to any claimed delay in the evaluation of any proposed substitute or in the acceptance or rejection of any proposed substitute.

PART 2 – PRODUCTS Not Used.

PART 3 – EXECUTION Not Used.

END OF DOCUMENT

DOCUMENT 01 26 00

CHANGES IN THE WORK

CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE PROVISIONS IN THE AGREEMENT, GENERAL CONDITIONS, AND SPECIAL CONDITIONS, IF USED, RELATED TO CHANGES AND/OR REQUESTS FOR CHANGES.

END OF DOCUMENT

DOCUMENT 01 29 00

**APPLICATION FOR PAYMENT AND
CONDITIONAL AND UNCONDITIONAL WAIVER AND RELEASE FORMS**

**CONTRACTOR SHALL COMPLY WITH ALL PROVISIONS IN THE GENERAL
CONDITIONS RELATED TO APPLICATIONS FOR PAYMENT AND/OR PAYMENTS.**

**CONDITIONAL WAIVER AND RELEASE
ON PROGRESS PAYMENT
(CIVIL CODE SECTION 8132)**

NOTICE: THIS DOCUMENT WAIVES THE CLAIMANT'S LIEN, STOP PAYMENT NOTICE, AND PAYMENT BOND RIGHTS EFFECTIVE ON RECEIPT OF PAYMENT. A PERSON SHOULD NOT RELY ON THIS DOCUMENT UNLESS SATISFIED THAT THE CLAIMANT HAS RECEIVED PAYMENT.

Name of Claimant: _____

Name of Customer: _____

Job Location: _____

Owner: _____

Through Date: _____

Conditional Waiver and Release

This document waives and releases lien, stop payment notice, and payment bond rights the claimant has for labor and service provided, and equipment and material delivered, to the customer on this job through the Through Date of this document. Rights based upon labor or service provided, or equipment or material delivered, pursuant to a written change order that has been fully executed by the parties prior to the date that this document is signed by the claimant, are waived and released by this document, unless listed as an Exception below. This document is effective only on the claimant's receipt of payment from the financial institution on which the following check is drawn:

Maker of Check: _____

Amount of Check: \$_____

Check Payable to: _____

Exceptions

This document does not affect any of the following:

- (1) Retentions.
- (2) Extras for which the claimant has not received payment.
- (3) The following progress payments for which the claimant has previously given a conditional waiver and release but has not received payment:

Date(s) of waiver and release: _____

Amount(s) of unpaid progress payment(s): \$_____

TRACY UNIFIED SCHOOL DISTRICT

**APPLICATION FOR PAYMENT AND
CONDITIONAL AND UNCONDITIONAL
WAIVER AND RELEASE FORMS
DOCUMENT 01 29 00-2**

- (4) Contract rights, including (A) a right based on rescission, abandonment, or breach of contract, and (B) the right to recover compensation for work not compensated by the payment.

Claimant's Signature: _____

Claimant's Title: _____

Date of Signature: _____

**UNCONDITIONAL WAIVER AND RELEASE
ON PROGRESS PAYMENT
(CIVIL CODE SECTION 8134)**

NOTICE TO CLAIMANT: THIS DOCUMENT WAIVES AND RELEASES LIEN, STOP PAYMENT NOTICE, AND PAYMENT BOND RIGHTS UNCONDITIONALLY AND STATES THAT YOU HAVE BEEN PAID FOR GIVING UP THOSE RIGHTS. THIS DOCUMENT IS ENFORCEABLE AGAINST YOU IF YOU SIGN IT, EVEN IF YOU HAVE NOT BEEN PAID. IF YOU HAVE NOT BEEN PAID, USE A CONDITIONAL WAIVER AND RELEASE FORM.

Name of Claimant: _____

Name of Customer: _____

Job Location: _____

Owner: _____

Through Date: _____

Unconditional Waiver and Release

This document waives and releases lien, stop payment notice, and payment bond rights the claimant has for labor and service provided, and equipment and material delivered, to the customer on this job through the Through Date of this document. Rights based upon labor or service provided, or equipment or material delivered, pursuant to a written change order that has been fully executed by the parties prior to the date that this document is signed by the claimant, are waived and released by this document, unless listed as an Exception below. The claimant has received the following progress payment: \$_____

Exceptions

This document does not affect any of the following:

- (1) Retentions.
- (2) Extras for which the claimant has not received payment.
- (3) Contract rights, including (A) a right based on rescission, abandonment, or breach of contract, and (B) the right to recover compensation for work not compensated by the payment.

Claimant's Signature: _____

Claimant's Title: _____

Date of Signature: _____

**CONDITIONAL WAIVER AND RELEASE
ON FINAL PAYMENT
(CIVIL CODE SECTION 8136)**

NOTICE: THIS DOCUMENT WAIVES THE CLAIMANT'S LIEN, STOP PAYMENT NOTICE, AND PAYMENT BOND RIGHTS EFFECTIVE ON RECEIPT OF PAYMENT. A PERSON SHOULD NOT RELY ON THIS DOCUMENT UNLESS SATISFIED THAT THE CLAIMANT HAS RECEIVED PAYMENT.

Name of Claimant: _____

Name of Customer: _____

Job Location: _____

Owner: _____

Conditional Waiver and Release

This document waives and releases lien, stop payment notice, and payment bond rights the claimant has for labor and service provided, and equipment and material delivered, to the customer on this job. Rights based upon labor or service provided, or equipment or material delivered, pursuant to a written change order that has been fully executed by the parties prior to the date that this document is signed by the claimant, are waived and released by this document, unless listed as an Exception below. This document is effective only on the claimant's receipt of payment from the financial institution on which the following check is drawn:

Maker of Check:

Amount of Check: \$_____

Check Payable to: _____

Exceptions

This document does not affect any of the following: _____

Disputed claims for extras in the amount of: \$_____

Claimant's Signature: _____

Claimant's Title: _____

Date of Signature: _____

**UNCONDITIONAL WAIVER AND RELEASE
ON FINAL PAYMENT**
(CIVIL CODE SECTION 8138)

NOTICE TO CLAIMANT: THIS DOCUMENT WAIVES AND RELEASES LIEN, STOP PAYMENT NOTICE, AND PAYMENT BOND RIGHTS UNCONDITIONALLY AND STATES THAT YOU HAVE BEEN PAID FOR GIVING UP THOSE RIGHTS. THIS DOCUMENT IS ENFORCEABLE AGAINST YOU IF YOU SIGN IT, EVEN IF YOU HAVE NOT BEEN PAID. IF YOU HAVE NOT BEEN PAID, USE A CONDITIONAL WAIVER AND RELEASE FORM.

Name of Claimant: _____

Name of Customer: _____

Job Location: _____

Owner: _____

Unconditional Waiver and Release

This document waives and releases lien, stop payment notice, and payment bond rights the claimant has for all labor and service provided, and equipment and material delivered, to the customer on this job. Rights based upon labor or service provided, or equipment or material delivered, pursuant to a written change order that has been fully executed by the parties prior to the date that this document is signed by the claimant, are waived and released by this document, unless listed as an Exception below. The claimant has been paid in full.

Exceptions

This document does not affect any of the following: _____

Disputed claims for extras in the amount of: \$_____

Claimant's Signature: _____

Claimant's Title: _____

Date of Signature: _____

PROJECT MEETINGS

PART 1 – GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions; and
- B. Special Conditions.

1.02 PROGRESS MEETINGS:

- A. Contractor shall schedule and hold regular weekly progress meetings after a minimum of one week's prior written notice of the meeting date and time to all Invitees as indicated below.
- B. Location: Contractor's field office.
- C. The Contractor shall notify and invite the following entities ("Invitees"):
 - (1) District Representative.
 - (2) Contractor.
 - (3) Contractor's Project Manager.
 - (4) Contractor's Superintendent.
 - (5) Subcontractors, as appropriate to the agenda of the meeting.
 - (6) Suppliers, as appropriate to the agenda of the meeting.
 - (7) Construction Manager, if any.
 - (8) Architect
 - (9) Engineer(s), if any and as appropriate to the agenda of the meeting.
 - (10) Others, as appropriate to the agenda of the meeting.
- D. The District's and/or the Architect's Consultants will attend at their discretion, in response to the agenda.
- E. The District representative, the Construction Manager, and/or another District Agent shall take and distribute meeting notes to attendees and other concerned parties. If exceptions are taken to anything in the meeting notes,

those exceptions shall be stated in writing to the District within five (5) working days following District's distribution of the meeting notes.

1.03 PRE-INSTALLATION/PERFORMANCE MEETING:

- A. Contractor shall schedule a meeting prior to the start of each of the demolition work phases. Contractor shall invite all Invitees to this meeting, and others whose work may affect or be affected by the quality of the demolition work.
- B. Contractor shall review in detail prior to this meeting, the manufacturer's requirements and specifications, applicable portions of the Contract Documents, Shop Drawings, and other submittals, and other related work. At this meeting, invitees shall review and resolve conflicts, incompatibilities, or inadequacies discovered or anticipated.
- C. Contractor shall review in detail Project conditions, schedule, requirements for performance, application, installation, and quality of completed Work, and protection of adjacent Work and property.
- D. Contractor shall review in detail means of protecting the completed Work during the remainder of the construction period.

PART 2 - PRODUCTS Not Used.

PART 3 - EXECUTION Not Used.

END OF DOCUMENT

SCHEDULING OF WORK

PART 1 – GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions;
- B. Special Conditions;
- C. Summary of Work; and
- D. Submittals.

1.02 SECTION INCLUDES

- A. Scheduling of Work under this Contract shall be performed by Contractor in accordance with requirements of this Section.
 - (1) Development of schedule, cost and resource loading of the schedule, monthly payment requests, and project status reporting requirements of the Contract shall employ computerized Critical Path Method ("CPM") scheduling ("CPM Schedule").
 - (2) CPM Schedule shall be cost loaded based on Schedule of Values as approved by District.
 - (3) Submit schedules and reports as specified in the General Conditions.
- B. Upon Award of Contract, Contractor shall immediately commence development of Initial and Original CPM Schedules to ensure compliance with CPM Schedule submittal requirements.

1.03 CONSTRUCTION SCHEDULE

- A. Within ten (10) days of issuance of the issuance Notice to Proceed and before request for first progress payment, the Contractor shall prepare and submit to the Project Manager a construction progress schedule conforming to the Milestone Schedule below.
- B. The Construction Schedule shall be continuously updated, and an updated schedule shall be submitted with each application for progress payment. Each revised schedule shall indicate the work actually accomplished during the previous period and the schedule for completion of the remaining work.

C. Milestone Schedule:

ACTIVITY DESCRIPTION

REQUIRED COMPLETION

CONSTRUCTION STARTS

05-26-2022

PHASE 1 DEMOLITION

PHASE 2 DEMOLITION

FINAL PROJECT COMPLETION

1.04 QUALIFICATIONS

- A. Contractor shall employ experienced scheduling personnel qualified to use the latest version of [i.e., Primavera Project Planner]. Experience level required is set forth below. Contractor may employ such personnel directly or may employ a consultant for this purpose.
- (1) The written statement shall identify the individual who will perform CPM scheduling.
 - (2) Capability and experience shall be verified by description of construction projects on which individual has successfully applied computerized CPM.
 - (3) Required level of experience shall include at least two (2) projects of similar nature and scope with value not less than three fourths ($\frac{3}{4}$) of the Total Bid Price of this Project. The written statement shall provide contact persons for referenced projects with current telephone and address information.
- B. District reserves the right to approve or reject Contractor's scheduler or consultant at any time. District reserves the right to refuse replacing of Contractor's scheduler or consultant, if District believes replacement will negatively affect the scheduling of Work under this Contract.

1.05 GENERAL

- A. Progress Schedule shall be based on and incorporate milestone and completion dates specified in Contract Documents.
- B. Overall time of completion and time of completion for each milestone shown on Progress Schedule shall adhere to times in the Contract, unless an earlier (advanced) time of completion is requested by Contractor and agreed to by District. Any such agreement shall be formalized by a Change Order.
- (1) District is not required to accept an early completion schedule, i.e., one that shows an earlier completion date than the Contract Time.
 - (2) Contractor shall not be entitled to extra compensation in event agreement is reached on an earlier completion schedule and Contractor completes its Work, for whatever reason, beyond completion date shown in its early completion schedule but within the Contract Time.

- (3) A schedule showing the work completed in less than the Contract Time, and that has been accepted by District, shall be considered to have Project Float. The Project Float is the time between the scheduled completion of the work and the Completion Date. Project Float is a resource available to both District and the Contractor.
- C. Ownership Project Float: Neither the District nor Contractor owns Project Float. The Project owns the Project Float. As such, liability for delay of the Completion Date rests with the party whose actions, last in time, actually cause delay to the Completion Date.
 - (1) For example, if Party A uses some, but not all of the Project Float and Party B later uses remainder of the Project Float as well as additional time beyond the Project Float, Party B shall be liable for the time that represents a delay to the Completion Date.
 - (2) Party A would not be responsible for the time since it did not consume the entire Project Float and additional Project Float remained; therefore, the Completion Date was unaffected by Party A.
- D. Progress Schedule shall be the basis for evaluating job progress, payment requests, and time extension requests. Responsibility for developing Contract CPM Schedule and monitoring actual progress as compared to Progress Schedule rests with Contractor.
- E. Failure of Progress Schedule to include any element of the Work, or any inaccuracy in Progress Schedule, will not relieve Contractor from responsibility for accomplishing the Work in accordance with the Contract. District's acceptance of schedule shall be for its use in monitoring and evaluating job progress, payment requests, and time extension requests and shall not, in any manner, impose a duty of care upon District, or act to relieve Contractor of its responsibility for means and methods of construction.
- F. Software: Use [i.e, District Project Planner for Windows, latest version]. Such software shall be compatible with Windows operating system. Contractor shall transmit contract file to District on compact disk at times requested by District.
- G. Transmit each item under the form approved by District.
 - (1) Identify Project with District Contract number and name of Contractor.
 - (2) Provide space for Contractor's approval stamp and District's review stamps.
 - (3) Submittals received from sources other than Contractor will be returned to the Contractor without District's review.

1.06 INITIAL CPM SCHEDULE

- A. Initial CPM Schedule submitted for review at the pre-construction conference shall serve as Contractor's schedule for up to ninety (90) calendar days after the Notice to Proceed.

- B. Indicate detailed plan for the Work to be completed in first ninety (90) days of the Contract; details of planned mobilization of plant and equipment; sequence of early operations; procurement of materials and equipment. Show Work beyond ninety (90) calendar days in summary form.
- C. Initial CPM Schedule shall be time scaled.
- D. Initial CPM Schedule shall be cost and resource loaded. Accepted cost and resource loaded schedule will be used as basis for monthly progress payments until acceptance of the Original CPM Schedule. Use of Initial CPM Schedule for progress payments shall not exceed ninety (90) calendar days.
- E. District and Contractor shall meet to review and discuss the Initial CPM Schedule within seven (7) calendar days after it has been submitted to District.
 - (1) District's review and comment on the schedule shall be limited to Contract conformance (with sequencing, coordination, and milestone requirements).
 - (2) Contractor shall make corrections to schedule necessary to comply with Contract requirements and shall adjust schedule to incorporate any missing information requested by District. Contractor shall resubmit Initial CPM Schedule if requested by District.
- F. If, during the first ninety (90) days after Notice to Proceed, the Contractor is of the opinion that any of the Work included on its Initial CPM Schedule has been impacted, the Contractor shall submit to District a written Time Impact Evaluation ("TIE") in accordance with Article 1.12 of this Section. The TIE shall be based on the most current update of the Initial CPM Schedule.

1.07 ORIGINAL CPM SCHEDULE

- A. Submit a detailed proposed Original CPM Schedule presenting an orderly and realistic plan for completion of the Work in conformance with requirements as specified herein.
- B. Progress Schedule shall include or comply with following requirements:
 - (1) Time scaled, cost and resource (labor and major equipment) loaded CPM schedule.
 - (2) No activity on schedule shall have duration longer than fifteen (15) work days, with exception of submittal, approval, fabrication and procurement activities, unless otherwise approved by District.
 - (a) Activity durations shall be total number of actual work days required to perform that activity.
 - (3) The start and completion dates of all items of Work, their major components, and milestone completion dates, if any.

- (4) District furnished materials and equipment, if any, identified as separate activities.
- (5) Activities for maintaining Project Record Documents.
- (6) Dependencies (or relationships) between activities.
- (7) Processing/approval of submittals and shop drawings for all material and equipment required per the Contract. Activities that are dependent on submittal acceptance or material delivery shall not be scheduled to start earlier than expected acceptance or delivery dates.
 - (a) Include time for submittals, re-submittals and reviews by District. Coordinate with accepted schedule for submission of Shop Drawings, samples, and other submittals.
 - (b) Contractor shall be responsible for all impacts resulting from re-submittal of Shop Drawings and submittals.
- (8) Procurement of major equipment, through receipt and inspection at jobsite, identified as separate activity.
 - (a) Include time for fabrication and delivery of manufactured products for the Work.
 - (b) Show dependencies between procurement and construction.
- (9) Activity description; what Work is to be accomplished and where.
- (10) The total cost of performing each activity shall be total of labor, material, and equipment, excluding overhead and profit of Contractor. Overhead and profit of the General Contractor shall be shown as a separate activity in the schedule. Sum of cost for all activities shall equal total Contract value.
- (11) Resources required (labor and major equipment) to perform each activity.
- (12) Responsibility code for each activity corresponding to Contractor or Subcontractor responsible for performing the Work.
- (13) Identify the activities which constitute the controlling operations or critical path. No more than twenty-five (25%) of the activities shall be critical or near critical. Near critical is defined as float in the range of one (1) to (10) days.
- (14) Twenty (20) workdays for developing punch list(s), completion of punch-list items, and final clean up for the Work or any designated portion thereof. No other activities shall be scheduled during this period.
- (15) Interface with the work of other contractors, District, and agencies such as, but not limited to, utility companies.

- (16) Show detailed Subcontractor Work activities. In addition, furnish copies of Subcontractor schedules upon which CPM was built.
 - (a) Also furnish for each Subcontractor, as determined by District, submitted on Subcontractor letterhead, a statement certifying that Subcontractor concurs with Contractor's Original CPM Schedule and that Subcontractor's related schedules have been incorporated, including activity duration, cost and resource loading.
 - (b) Subcontractor schedules shall be independently derived and not a copy of Contractor's schedule.
 - (c) In addition to Contractor's schedule and resource loading, obtain from electrical, mechanical, and plumbing Subcontractors, and other Subcontractors as required by District, productivity calculations common to their trades, such as units per person day, feet of pipe per day per person, feet of wiring per day per person, and similar information.
 - (d) Furnish schedule for Contractor/Subcontractor CPM schedule meetings which shall be held prior to submission of Original CPM schedule to District. District shall be permitted to attend scheduled meetings as an observer.
- (17) Activity durations shall be in Work days.
- (18) Submit with the schedule a list of anticipated non-Work days, such as weekends and holidays. The Progress Schedule shall exclude in its Work day calendar all non-Work days on which Contractor anticipates critical Work will not be performed.
- C. Original CPM Schedule Review Meeting: Contractor shall, within sixty (60) days from the Notice to Proceed date, meet with District to review the Original CPM Schedule submittal.
 - (1) Contractor shall have its Project Manager, Project Superintendent, Project Scheduler, and key Subcontractor representatives, as required by District, in attendance. The meeting will take place over a continuous one (1) day period.
 - (2) District's review will be limited to submittal's conformance to Contract requirements including, but not limited to, coordination requirements. However, review may also include:
 - (a) Clarifications of Contract Requirements.
 - (b) Directions to include activities and information missing from submittal.
 - (c) Requests to Contractor to clarify its schedule.

- (3) Within five (5) days of the Schedule Review Meeting, Contractor shall respond in writing to all questions and comments expressed by District at the Meeting.

1.08 ADJUSTMENTS TO CPM SCHEDULE

- A. Adjustments to Original CPM Schedule: Contractor shall have adjusted the Original CPM Schedule submittal to address all review comments from original CPM Schedule review meeting and resubmit network diagrams and reports for District's review.
 - (1) District, within ten (10) days from date that Contractor submitted the revised schedule, will either:
 - (a) Accept schedule and cost and resource loaded activities as submitted, or
 - (b) Advise Contractor in writing to review any part or parts of schedule which either do not meet Contract requirements or are unsatisfactory for District to monitor Project's progress, resources, and status or evaluate monthly payment request by Contractor.
 - (2) District may accept schedule with conditions that the first monthly CPM Schedule update be revised to correct deficiencies identified.
 - (3) When schedule is accepted, it shall be considered the "Original CPM Schedule" which will then be immediately updated to reflect the current status of the work.
 - (4) District reserves right to require Contractor to adjust, add to, or clarify any portion of schedule which may later be discovered to be insufficient for monitoring of Work or approval of partial payment requests. No additional compensation will be provided for such adjustments, additions, or clarifications.
- B. Acceptance of Contractor's schedule by District will be based solely upon schedule's compliance with Contract requirements.
 - (1) By way of Contractor assigning activity durations and proposing sequence of Work, Contractor agrees to utilize sufficient and necessary management and other resources to perform work in accordance with the schedule.
 - (2) Upon submittal of schedule update, updated schedule shall be considered "current" CPM Schedule.
 - (3) Submission of Contractor's schedule to District shall not relieve Contractor of total responsibility for scheduling, sequencing, and pursuing Work to comply with requirements of Contract Documents, including adverse effects such as delays resulting from ill-timed Work.

- C. Submittal of Original CPM Schedule, and subsequent schedule updates, shall be understood to be Contractor's representation that the Schedule meets requirements of Contract Documents and that Work shall be executed in sequence indicated on the schedule.
- D. Contractor shall distribute Original CPM Schedule to Subcontractors for review and written acceptance, which shall be noted on Subcontractors' letterheads to Contractor and transmitted to District for the record.

1.09 MONTHLY CPM SCHEDULE UPDATE SUBMITTALS

- A. Following acceptance of Contractor's Original CPM Schedule, Contractor shall monitor progress of Work and adjust schedule each month to reflect actual progress and any anticipated changes to planned activities.
 - (1) Each schedule update submitted shall be complete, including all information requested for the Original CPM Schedule submittal.
 - (2) Each update shall continue to show all Work activities including those already completed. These completed activities shall accurately reflect "as built" information by indicating when activities were actually started and completed.
- B. A meeting will be held on approximately the twenty-fifth (25th) of each month to review the schedule update submittal and progress payment application.
 - (1) At this meeting, at a minimum, the following items will be reviewed: Percent (%) complete of each activity; Time Impact Evaluations for Change Orders and Time Extension Request; actual and anticipated activity sequence changes; actual and anticipated duration changes; and actual and anticipated Contractor delays.
 - (2) These meetings are considered a critical component of overall monthly schedule update submittal and Contractor shall have appropriate personnel attend. At a minimum, these meetings shall be attended by Contractor's General Superintendent and Scheduler.
 - (3) Contractor shall plan on the meeting taking no less than four (4) hours.
- C. Within five (5) working days after monthly schedule update meeting, Contractor shall submit the updated CPM Schedule update.
- D. Within five (5) work days of receipt of above noted revised submittals, District will either accept or reject monthly schedule update submittal.
 - (1) If accepted, percent (%) complete shown in monthly update will be basis for Application for Payment by the Contractor. The schedule update shall be submitted as part of the Contractor's Application for Payment.

- (2) If rejected, update shall be corrected and resubmitted by Contractor before the Application for Payment is submitted.
- E. Neither updating, changing or revising of any report, curve, schedule, or narrative submitted to District by Contractor under this Contract, nor District's review or acceptance of any such report, curve, schedule or narrative shall have the effect of amending or modifying in any way the Completion Date or milestone dates or of modifying or limiting in any way Contractor's obligations under this Contract.

1.10 SCHEDULE REVISIONS

- A. Updating the Schedule to reflect actual progress shall not be considered revisions to the Schedule. Since scheduling is a dynamic process, revisions to activity durations and sequences are expected on a monthly basis.
- B. To reflect revisions to the Schedule, the Contractor shall provide District with a written narrative with a full description and reasons for each Work activity revised. For revisions affecting the sequence of work, the Contractor shall provide a schedule diagram which compares the original sequence to the revised sequence of work. The Contractor shall provide the written narrative and schedule diagram for revisions two (2) working days in advance of the monthly schedule update meeting.
- C. Schedule revisions shall not be incorporated into any schedule update until the revisions have been reviewed by District. District may request further information and justification for schedule revisions and Contractor shall, within three (3) days, provide District with a complete written narrative response to District's request.
- D. If the Contractor's revision is still not accepted by District, and the Contractor disagrees with District's position, the Contractor has seven (7) calendar days from receipt of District's letter rejecting the revision to provide a written narrative providing full justification and explanation for the revision. The Contractor's failure to respond in writing within seven (7) calendar days of District's written rejection of a schedule revision shall be contractually interpreted as acceptance of District's position, and the Contractor waives its rights to subsequently dispute or file a claim regarding District's position.
- E. At District's discretion, the Contractor can be required to provide Subcontractor certifications of performance regarding proposed schedule revisions affecting said Subcontractors.

1.11 RECOVERY SCHEDULE

- A. If the Schedule Update shows a completion date twenty-one (21) calendar days beyond the Contract Completion Date, or individual milestone completion dates, the Contractor shall submit to District the proposed revisions to recover the lost time within seven (7) calendar days. As part of this submittal, the Contractor shall provide a written narrative for each revision made to recapture the lost time. If the revisions include sequence changes, the Contractor shall provide a schedule diagram comparing the original sequence to the revised sequence of work.

- B. The revisions shall not be incorporated into any schedule update until the revisions have been reviewed by District.
- C. If the Contractor's revisions are not accepted by District, District and the Contractor shall follow the procedures in paragraph 1.09.C, 1.09.D and 1.09.E above.
- D. At District's discretion, the Contractor can be required to provide Subcontractor certifications for revisions affecting said Subcontractors.

1.12 TIME IMPACT EVALUATION ("TIE") FOR CHANGE ORDERS, AND OTHER DELAYS

- A. When Contractor is directed to proceed with changed Work, the Contractor shall prepare and submit within fourteen (14) calendar days from the Notice to Proceed a TIE which includes both a written narrative and a schedule diagram depicting how the changed Work affects other schedule activities. The schedule diagram shall show how the Contractor proposes to incorporate the changed Work in the schedule and how it impacts the current schedule-update critical path. The Contractor is also responsible for requesting time extensions based on the TIE's impact on the critical path. The diagram must be tied to the main sequence of schedule activities to enable District to evaluate the impact of changed Work to the scheduled critical path.
- B. Contractor shall be required to comply with the requirements of Paragraph 1.09.A for all types of delays such as, but not limited to, Contractor/Subcontractor delays, adverse weather delays, strikes, procurement delays, fabrication delays, etc.
- C. Contractor shall be responsible for all costs associated with the preparation of TIEs, and the process of incorporating them into the current schedule update. The Contractor shall provide District with four (4) copies of each TIE.
- D. Once agreement has been reached on a TIE, the Contract Time will be adjusted accordingly. If agreement is not reached on a TIE, the Contract Time may be extended in an amount District allows, and the Contractor may submit a claim for additional time claimed by contractor.

1.13 TIME EXTENSIONS

- A. The Contractor is responsible for requesting time extensions for time impacts that, in the opinion of the Contractor, impact the critical path of the current schedule update. Notice of time impacts shall be given in accord with the General Conditions.
- B. Where an event for which District is responsible impacts the projected Completion Date, the Contractor shall provide a written mitigation plan, including a schedule diagram, which explains how (e.g., increase crew size, overtime, etc.) the impact can be mitigated. The Contractor shall also include a detailed cost breakdown of the labor, equipment, and material the Contractor would expend to mitigate District-caused time impact. The Contractor shall submit its mitigation plan to District within fourteen (14)

calendar days from the date of discovery of the impact. The Contractor is responsible for the cost to prepare the mitigation plan.

- C. Failure to request time, provide TIE, or provide the required mitigation plan will result in Contractor waiving its right to a time extension and cost to mitigate the delay.
- D. No time will be granted under this Contract for cumulative effect of changes.
- E. District will not be obligated to consider any time extension request unless the Contractor complies with the requirements of Contract Documents.
- F. Failure of the Contractor to perform in accordance with the current schedule update shall not be excused by submittal of time extension requests.
- G. If the Contractor does not submit a TIE within the required fourteen (14) calendar days for any issue, it is mutually agreed that the Contractor does not require a time extension for said issue.

1.14 SCHEDULE REPORTS

- A. Submit four (4) copies of the following reports with the Initial CPM Schedule, the Original CPM Schedule, and each monthly update.
- B. Required Reports:
 - (1) Two activity listing reports: one sorted by activity number and one by total Project Float. These reports shall also include each activity's early/late and actual start and finish dates, original and remaining duration, Project Float, responsibility code, and the logic relationship of activities.
 - (2) Cost report sorted by activity number including each activity's associated cost, percentage of Work accomplished, earned value- to date, previous payments, and amount earned for current update period.
 - (3) Schedule plots presenting time-scaled network diagram showing activities and their relationships with the controlling operations or critical path clearly highlighted.
 - (4) Cash flow report calculated by early start, late start, and indicating actual progress. Provide an exhibit depicting this information in graphic form.
 - (5) Planned versus actual resource (i.e., labor) histogram calculated by early start and late start.
- C. Other Reports:

In addition to above reports, District may request, from month to month, any two of the following reports. Submit four (4) copies of all reports.

- (1) Activities by early start.
 - (2) Activities by late start.
 - (3) Activities grouped by Subcontractors or selected trades.
 - (4) Activities with scheduled early start dates in a given time frame, such as fifteen (15) or thirty (30) day outlook.
- D. Furnish District with report files on compact disks containing all schedule files for each report generated.

1.15 PROJECT STATUS REPORTING

- A. In addition to submittal requirements for CPM scheduling identified in this Section, Contractor shall provide a monthly project status report (i.e., written narrative report) to be submitted in conjunction with each CPM Schedule as specified herein. Status reporting shall be in form specified below.
- B. Contractor shall prepare monthly written narrative reports of status of Project for submission to District. Written status reports shall include:
- (1) Status of major Project components (percent (%) complete, amount of time ahead or behind schedule) and an explanation of how Project will be brought back on schedule if delays have occurred.
 - (2) Progress made on critical activities indicated on CPM Schedule.
 - (3) Explanations for any lack of work on critical path activities planned to be performed during last month.
 - (4) Explanations for any schedule changes, including changes to logic or to activity durations.
 - (5) List of critical activities scheduled to be performed next month.
 - (6) Status of major material and equipment procurement.
 - (7) Any delays encountered during reporting period.
 - (8) Contractor shall provide printed report indicating actual versus planned resource loading for each trade and each activity. This report shall be provided on weekly and monthly basis.
 - (a) Actual resource shall be accumulated in field by Contractor, and shall be as noted on Contractor's daily reports. These reports will be basis for information provided in computer-generated monthly and weekly printed reports.
 - (b) Contractor shall explain all variances and mitigation measures.

- (9) Contractor may include any other information pertinent to status of Project. Contractor shall include additional status information requested by District at no additional cost.
- (10) Status reports, and the information contained therein, shall not be construed as claims, notice of claims, notice of delay, or requests for changes or compensation.

1.16 WEEKLY SCHEDULE REPORT

At the Weekly Progress Meeting, the Contractor shall provide and present a time-scaled three (3) week look-ahead schedule that is based and correlated by activity number to the current schedule (i.e., Initial, Original CPM, or Schedule Update).

1.17 DAILY CONSTRUCTION REPORTS

On a daily basis, Contractor shall submit a daily activity report to District for each workday, including weekends and holidays when worked. Contractor shall develop the daily construction reports on a computer-generated database capable of sorting daily Work, manpower, and man-hours by Contractor, Subcontractor, area, sub-area, and Change Order Work. Upon request of District, furnish computer disk of this data base. Obtain District's written approval of daily construction report data base format prior to implementation. Include in report:

- A. Project name and Project number.
- B. Contractor's name and address.
- C. Weather, temperature, and any unusual site conditions.
- D. Brief description and location of the day's scheduled activities and any special problems and accidents, including Work of Subcontractors. Descriptions shall be referenced to CPM scheduled activities.
- E. Worker quantities for its own Work force and for Subcontractors of any tier.
- F. Equipment, other than hand tools, utilized by Contractor and Subcontractors.

1.18 PERIODIC VERIFIED REPORTS

Contractor shall complete and verify construction reports on a form prescribed by the Division of the State Architect and file reports on the first day of February, May, August, and November during the preceding quarter year; at the completion of the Contract; at the completion of the Work; at the suspension of Work for a period of more than one (1) month; whenever the services of Contractor or any of Contractor's Subcontractors are terminated for any reason; and at any time a special verified report is required by the Division of the State Architect. Refer to section 4-336 and section 4-343 of Part 1, Title 24 of the California Code of Regulations.

PART 2 – PRODUCTS Not Used.

PART 3 - EXECUTION Not Used.

END OF DOCUMENT

SUBMITTALS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Contractor's Submittals and Schedules, Drawings and Specifications;
- B. Special Conditions.

1.02 SECTION INCLUDES:

- A. Definitions:
 - (1) Shop Drawings and Product Data are as indicated in the General Conditions and include, but are not limited to, fabrication, erection, layout and setting drawings, formwork and falsework drawings, manufacturers' standard drawings, descriptive literature, catalogues, brochures, performance and test data, wiring and control diagrams. In addition, there are other drawings and descriptive data pertaining to materials, equipment, piping, duct and conduit systems, and methods of construction as may be required to show that the materials, equipment or systems and all positions conform to the requirement of the Contract Documents, including, without limitation, the Drawings.
 - (2) "Manufactured" applies to standard units usually mass-produced; "fabricated" means specifically assembled or made out of selected materials to meet design requirements. Shop Drawings shall establish the actual detail of manufactured or fabricated items, indicated proper relation to adjoining work and amplify design details of mechanical and electrical equipment in proper relation to physical spaces in the structure.
 - (3) Manufacturer's Instructions: Where any item of Work is required by the Contract Documents to be furnished, installed, or performed, at a minimum, in accordance with a specified product manufacturer's instructions, the Contractor shall procure and distribute copies of these to the District, the Architect, and all other concerned parties and shall furnish, install, or perform the work, at a minimum, in accordance with those instructions.
- B. Samples, Shop Drawings, Product Data, and other items as specified, in accordance with the following requirements:
 - (1) Contractor shall submit all Shop Drawings, Product Data, and Samples to the District, the Architect, the Project Inspector, and the Construction Manager.

Contractor to review section
01 3300 as well as this
document

- (2) Contractor shall comply with all time frames herein and in the General Conditions and, in any case, shall submit required information in sufficient time to permit proper consideration and action before ordering any materials or items represented by such Shop Drawings, Product Data, and/or Samples.
- (3) Contractor shall allow sufficient time so that no delay occurs due to required lead time in ordering or delivery of any item to the Site. Contractor shall be responsible for any delay in progress of Work due to its failure to observe these requirements.
- (4) Time for completion of Work shall not be extended on account of Contractor's failure to promptly submit Shop Drawings, Product Data, and/or Samples.
- (5) Reference numbers on Shop Drawings shall have Architectural and/or Engineering Contract Drawings reference numbers for details, sections, and "cuts" shown on Shop Drawings. These reference numbers shall be in addition to any numbering system that Contractor chooses to use or has adopted as standard.
- (6) When the magnitude or complexity of submittal material prevents a complete review within the stated time frame, Contractor shall make this submittal in increments to avoid extended delays.
- (7) Contractor shall certify on submittals for review that submittals conform to Contract requirements. Also certify that Contractor-furnished equipment can be installed in allocated space. In event of any variance, Contractor shall specifically state in transmittal and on Shop Drawings, portions vary and require approval of a substitute. Submittals shall not be used as a means of requesting a substitution.
- (8) Unless specified otherwise, sampling, preparation of samples, and tests shall be in accordance with the latest standard of the American Society for Testing and Materials.
- (9) Upon demand by Architect or District, Contractor shall submit samples of materials and/or articles for tests or examinations and consideration before Contractor incorporates same in Work. Contractor shall be solely responsible for delays due to sample(s) not being submitted in time to allow for tests. Acceptance or rejection will be expressed in writing. Work shall be equal to approved samples in every respect. Samples that are of value after testing will remain the property of Contractor.

C. Submittal Schedule:

- (1) Contractor shall prepare its proposed submittal schedule that is coordinated with the proposed construction schedule and submit both to the District within ten (10) days after the date of the Notice to Proceed. Contractor's proposed schedules shall become the Project Construction Schedule and the Project Submittal Schedule after each is approved by the District.

Contractor to review section
01 3300 as well as this
document

- (2) Contractor is responsible for all lost time should the initial submittal be rejected, marked "revise and resubmit", etc.
- (3) All Submittals shall be forwarded to the District by the date indicated on the approved Submittal Schedule, unless an earlier date is necessary to maintain the Construction Schedule, in which case those Submittals shall be forwarded to the District so as not to delay the Construction Schedule.
- (4) Contractor may be assessed \$100 a day for each day it is late in submitting a shop drawing or sample. No extensions of time will be granted to Trade Contractor or any Subcontractor because of its failure to have shop drawings and samples submitted in accordance with the Schedule.

1.03 SHOP DRAWINGS:

- A. Contractor shall submit one reproducible transparency and six (6) opaque reproductions. The District will review and return the reproducible copy and one (1) opaque reproduction to Contractor.
- B. Before commencing installation of any Work, the Contractor shall submit and receive approval of all drawings, descriptive data, and material list(s) as required to accomplish Work.
- C. Review of Shop Drawings is regarded as a service to assist Contractor and in all cases original Contract Documents shall take precedence as outlined under General Conditions.
- D. No claim for extra time or payment shall be based on work shown on Shop Drawings unless the claim is (1) noted on Contractor's transmittal letter accompanying Shop Drawings and (2) Contractor has complied with all applicable provisions of the General Conditions, including, without limitation, provisions regarding changes and payment, and all required written approvals.
- E. District shall not review Shop Drawings for quantities of materials or number of items supplied.
- F. District's and/or Architect's review of Shop Drawing will be general. District and/or Architect review does not relieve Contractor of responsibility for dimensions, accuracy, proper fitting, construction of Work, furnishing of materials, or Work required by Contract Documents and not indicated on Shop Drawings. The District's and/or Architect's review of Shop Drawings is not to be construed as approving departures from Contract Documents.
- G. Review of Shop Drawings and Schedules does not relieve Contractor from responsibility for any aspect of those Drawings or Schedules that is a violation of local, County, State, or Federal laws, rules, ordinances, or rules and regulations of commissions, boards, or other authorities or utilities having jurisdiction.
- H. Before submitting Shop Drawings for review, Contractor shall check Shop Drawings of its subcontractors for accuracy, and confirm that all Work

Contractor to review section
01 3300 as well as this
document

contiguous with and having bearing on other work shown on Shop Drawings is accurately drawn and in conformance with Contract Documents.

- I. Submitted drawings and details must bear stamp of approval of Contractor:
 - (1) Stamp and signature shall clearly certify that Contractor has checked Shop Drawings for compliance with Drawings.
 - (2) If Contractor submits a Shop Drawing without an executed stamp of approval, or whenever it is evident (despite stamp) that Drawings have not been checked, the District and/or Architect will not consider them and will return them to the Contractor for revision and resubmission. In that event, it will be deemed that Contractor has not complied with this provision and Contractor shall bear risk of all delays to same extent as if it had not submitted any Shop Drawings or details.
- J. Submission of Shop Drawings (in either original submission or when resubmitted with correction) constitutes evidence that Contractor has checked all information thereon and that it accepts and is willing to perform Work as shown.
- K. Contractor shall pay for cost of any changes in construction due to improper checking and coordination. Contractor shall be responsible for all additional costs, including coordination. Contractor shall be responsible for costs incurred by itself, the District, the Architect, the Project Inspector, the Construction Manager, any other Subcontractor or contractor, etc., due to improperly checked and/or coordination of submittals.
- L. Shop Drawings must clearly delineate the following information:
 - (1) Project name and address.
 - (2) Specification number and description.
 - (3) Architect's name and project number.
 - (4) Shop Drawing title, number, date, and scale.
 - (5) Names of Contractor, Subcontractor(s) and fabricator.
 - (6) Working and erection dimensions.
 - (7) Arrangements and sectional views.
 - (8) Necessary details, including complete information for making connections with other Work.
 - (9) Kinds of materials and finishes.
 - (10) Descriptive names of materials and equipment, classified item numbers, and locations at which materials or equipment are to be installed in the Work. Contractor shall use same reference identification(s) as shown on Contract Drawings.

Contractor to review section
01 3300 as well as this
document

- M. Contractor shall prepare composite drawings and installation layouts when required to solve tight field conditions.
 - (1) Shop Drawings shall consist of dimensioned plans and elevations and must give complete information, particularly as to size and location of sleeves, inserts, attachments, openings, conduits, ducts, boxes, structural interferences, etc.
 - (2) Contractor shall coordinate these composite Shop Drawings and installation layouts in the field between itself and its Subcontractor(s) for proper relationship to the Work, the work of other trades, and the field conditions. The Contractor shall check and approve all submittal(s) before submitting them for final review.

1.04 PRODUCT DATA OR NON REPRODUCIBLE SUBMITTALS:

- A. Contractor shall submit manufacturer's printed literature in original form. Any fading type of reproduction will not be accepted. Contractor must submit a minimum of six (6) each, to the District. District shall return one (1) to the Contractor, who shall reproduce whatever additional copies it requires for distribution.
- B. Contractor shall submit six (6) copies of a complete list of all major items of mechanical, plumbing, and electrical equipment and materials in accordance with the approved Submittal Schedule, except as required earlier to comply with the approved Construction Schedule. Other items specified are to be submitted prior to commencing Work. Contractor shall submit items of like kind at one time in a neat and orderly manner. Partial lists will not be acceptable.
- C. Submittals shall include manufacturer's specifications, physical dimensions, and ratings of all equipment. Contractor shall furnish performance curves for all pumps and fans. Where printed literature describes items in addition to that item being submitted, submitted item shall be clearly marked on sheet and superfluous information shall be crossed out. If highlighting is used, Contractor shall mark all copies.
- D. Equipment submittals shall be complete and include space requirements, weight, electrical and mechanical requirements, performance data, and supplemental information that may be requested.
- E. Imported Materials Certification must be submitted at least ten (10) days before material is delivered.

1.05 SAMPLES:

- A. Contractor shall submit for approval Samples as required and within the time frame in the Contract Documents. Materials such as concrete, mortar, etc., which require on-site testing will be obtained from Project Site.
- B. Contractor shall submit four (4) samples except where greater or lesser number is specifically required by Contract Documents including, without limitation, the Specifications.

Contractor to review section
01 3300 as well as this
document

- (1) Samples must be of sufficient size and quality to clearly illustrate functional characteristics, with integrally related parts and attachment devices.
 - (2) Samples must show full range of texture, color, and pattern.
- C. Contractor shall make all Submittals, unless it has authorized Subcontractor(s) to submit and Contractor has notified the District in writing to this effect.
- D. Samples to be shipped prepaid or hand-delivered to the District.
- E. Contractor shall mark samples to show name of Project, name of Contractor submitting, Contract number and segment of Work where representative Sample will be used, all applicable Specifications Sections and documents, Contract Drawing Number and detail, and ASTM or FS reference, if applicable.
- F. Contractor shall not deliver any material to Site prior to receipt of District's and/or Architect's completed written review and approval. Contractor shall furnish materials equal in every respect to approved Samples and execute Work in conformance therewith.
- G. District's and/or Architect's review, acceptance, and/or approval of Sample(s) will not preclude rejections of any material upon discovery of defects in same prior to final acceptance of completed Work.
- H. After a material has been approved, no change in brand or make will be permitted.
- I. Contractor shall prepare its Submittal Schedule and submit Samples of materials requiring laboratory tests to specified laboratory for testing not less than ninety (90) days before such materials are required to be used in Work.
- J. Samples which are rejected must be resubmitted promptly after notification of rejection and be marked "Resubmitted Sample" in addition to other information required.
- K. Field Samples and Mock-Ups are to be removed by Contractor at District's direction:
 - (1) Size: As Specified.
 - (2) Furnish catalog numbers and similar data, as requested.

1.06 REVIEW AND RESUBMISSION REQUIREMENTS:

- A. The District will arrange for review of Sample(s), Shop Drawing(s), Product Data, and other submittal(s) by appropriate reviewer and return to Contractor as provided below within twenty-one (21) days after receipt or within twenty-one (21) days after receipt of all related information necessary for such review, whichever is later.
- B. One (1) copy of product or materials data will be returned to Contractor with the review status.

Contractor to review section
01 3300 as well as this
document

- C. Samples to be incorporated into the Work will be returned to Contractor, together with a written notice designating the Sample with the appropriate review status and indicating errors discovered on review, if any. Other Samples will not be returned, but the same notice will be given with respect thereto, and that notice shall be considered a return of the Sample.
- D. Contractor shall revise and resubmit any Sample(s), Shop Drawing(s), Product Data, and other submittal(s) as required by the reviewer. Such resubmittals will be reviewed and returned in the same manner as original Sample(s), Shop Drawing(s), Product Data, and other submittal(s), within fourteen (14) days after receipt thereof or within fourteen (14) days after receipt of all related information necessary for such review. Such resubmittal shall not delay the Work.
- E. Contractor may proceed with any of the Work covered by Sample(s), Shop Drawing(s), Product Data, and other submittal(s) upon its return if designated as no exception taken, or revise as noted, provided the Contractor proceeds in accordance with the District and/or the Architect's notes and comments.
- F. Contractor shall not begin any of the work covered by a Sample(s), Shop Drawing(s), Product Data, and other submittal(s), designated as revise and resubmit or rejected, until a revision or correction thereof has been reviewed and returned to Contractor.
- G. Sample(s), Shop Drawing(s), Product Data, and other submittal(s) designated as revise and resubmit or rejected and requiring resubmittal, shall be revised or corrected and resubmitted to the District no later than fourteen (14) days or a shorter period as required to comply with the approved Construction Schedule, after its return to Contractor.
- H. Neither the review nor the lack of review of any Sample(s), Shop Drawing(s), Product Data, and other submittal(s) shall waive any of the requirements of the Contract Documents, or relieve Contractor of any obligation thereunder.
- I. District's and/or Architect's review of Shop Drawings does not relieve the Contractor of responsibility for any errors that may exist. Contractor is responsible for the dimensions and design of adequate connections and details and for satisfactory construction of all the Work.

PART 2 – PRODUCTS Not Used.

PART 3 - EXECUTION Not Used.

END OF DOCUMENT

Art Freiler E.S. TK Portable Classroom Building
Tracy Unified School District

SUBMITTAL NO.:

Architect's Project # 3595001

DATE: _____

DSA File/Apl. # 39-73/02-122126

Re-Submittal of Original No.: _____

1. SUBMITTAL TRANSMITTAL

Attention: Affifa Kadhim

Contractor: Company

Contact: Name _____

Sub Contractor:

Contact: _____



Please submit only one trade per submittal! Description of submitted materials:

Quantity submitted	Specification Section		Description of contents (e.g. product data, shop drawings, samples)
	Section #	Section Title	

Contractor Statement: (read and acknowledge)

This submittal has been reviewed and approved with respect to the means, methods, techniques, and procedures of construction, safety precautions, and program incidentals thereto. This submittal complies with the contract documents and comprises no variations thereto, unless accompanied by a substitution request.

By: _____
Name

Date: _____

2. RE-TRANSMITTAL TO CONTRACTOR:

Distribution: Contractor, Owner, Project Inspector, RGA, Other

- ☐ NO EXCEPTIONS TAKEN
☐ SUBMIT SPECIFIED ITEM

- ☐ REJECTED
☐ REVISE AND RESUBMIT

- ☐ FURNISH AS CORRECTED
☐ NO ACTION REQUIRED

Corrections or comments made on the shop drawings during this review do not relieve the Contractor from compliance with requirements of the Drawings and Specifications. This general check is only for the review of conformance with the design concept of the project and general compliance with the information given in the Contract Documents. The Contractor is responsible for confirming and correlating all quantities and dimensions, selecting fabrication processes and techniques of construction, coordinating his work with that of all the other trades, and performing his work in a safe and satisfactory manner.

Rainforth Grau Architects

By: _____ Date: _____

Additional Comments:

See Specification Section 01 3300 for use of this form

Art Freiler E.S. TK Portable Classroom Building
Tracy Unified School District

**SUBSTITUTION
REQUEST NO.:**

Architect's Project # 3595001
DSA File/Appl. # 39-73/02-122126

Date: _____

1. SUBSTITUTION REQUEST

Attention: Affifa Kadhim

Contractor: Company _____

Contact: Name _____



Please submit only one product per request!

Sub Contractor: _____

Include with a specified product Submittal

Contact: _____

2. PROPOSED SUBSTITUTIONS: The undersigned requests consideration of the following substitution:

Specified Item: _____ Page No.: _____ Paragraph No.: _____

Proposed Item: _____

3. REASON FOR REQUEST:

4. REQUIREMENTS FOR SUBSTITUTIONS:

Attached data includes product description, specifications, drawings, photographs, performance and test data adequate for evaluation of request; applicable portions of data are clearly identified. Attached data also includes a description of changes to Contract Documents, which proposed substitution will require for its proper installation.

The undersigned certifies that the following paragraphs, unless modified by attachments, are correct:

1. The proposed substitution does not affect dimensions shown on drawings and does not require design changes in the Contract Documents.
2. The undersigned will pay for changes to the building design, including engineering design, detailing and construction costs caused by the requested substitution.
3. The proposed substitution will have no adverse effect on the work, the schedule or specified warranty requirements.
4. Maintenance and service parts will be readily available for the proposed substitution.

The undersigned further states that the function, appearance and quality of the proposed substitution are equivalent or superior to the specified item.

Signature - Contractor/Subcontractor

Date

5. TRANSMITTAL TO CONTRACTOR:

Distribution: Contractor, Owner, Project Inspector, RGA, Other

☐ **ACCEPTED**

☐ **ACCEPTED AS NOTED**

☐ **REJECTED**

Rainforth Grau Architects

By: _____

Date: _____

Comments:

Art Freiler E.S. TK Portable Classroom Building
Tracy Unified School District

RFI NO.:

Architect's Project # 3595001
DSA File/Apl. # 39-73/02-122126

Date: _____

1. REQUEST FOR INFORMATION

Attention: Affifa Kadhim

From:

Contractor:

Company

Contact:

Name

Sub Contractor:

Contact:



Identify related specific references within the Contract Documents and supporting information:

Dwg./Document No.: _____

Building/Site Location: _____

2. Existing Condition (source / reason for the request):

3. Recommended Contractor Action(s) for resolution:

4. Project Inspector Acknowledgment:

Date Reviewed: _____

5. Owner / A/E Resolution(s):

Date of Response: _____ By: _____

Attachments: _____

Extra Work Involved in the Above Described Change?

Yes ☐

No ☐

Distribution: Contractor, Owner, Project Inspector, RGA, Other
See Specification Section 01300 for use of this form

Art Freiler E.S. TK Portable Classroom Building
Tracy Unified School District

**E-DATA
REQUEST NO.:**

Architect's Project # 3595001
DSA File/Appl. # 39-73/02-122126

Date: _____

1. ELECTRONIC DATA REQUEST

Attention: Affifa Kadhim

From: Contractor: Company

Contact: Name

Sub Contractor:

Contact: _____



2. DATA REQUESTED - Provide list of specific drawings requested (include sheet numbers):

3. REASON FOR REQUEST - Provide clear explanation of why information is desired and for what purpose it will be utilized:

4. ACKNOWLEDGEMENT OF RESPONSIBILITY:

The electronic data files requested are distributed for reference only. Transferring such files can alter, delete or change original information. Accuracy of the data cannot be guaranteed as correct or complete and the Contractor accepts full responsibility for any and all inaccuracies, regardless of cause.

The hard copy documents, including addenda and subsequent written changes to the documents, represent the complete work of the contract and all electronic files should be cross-referenced and verified from that information as electronic files may not contain all contract information. It is the Contractor's responsibility to make any changes or revisions necessary.

This electronic data is furnished without guarantee of compatibility with your hardware or software. It is the Contractor's responsibility to notify the Architect in the event a compatibility problem or disk defect is encountered and a replacement disk is necessary.

This electronic data, in its present form, remains the property of Rainforth Grau Architects and shall not be used for any other purpose than to provide background information for the project noted above. It is not to be released to any other party without the written consent of Rainforth Grau Architects.

Accepted by: _____
Signature - Contractor/Subcontractor

Representing: _____
Contractor/Subcontractor Company Name

MEGGER GROUNDING TEST CERTIFICATE

This certifies that a Megger Grounding Test for the **Art Freiler Elementary School - TK Portable Classroom Building** for the **Tracy Unified** School District, of **San Joaquin** County, California was conducted on the _____ day of _____, **2024**, per CCR Title 24, Sections 200 H and J. The undersigned verifies that the resistance to ground was 25 ohms or less, as required, and is found to be acceptable.

Project Name: _____

DSA File No.: _____ DSA Application No.: _____

Address: _____

General Contractor's Signature: _____

Electrical Contractor's Signature: _____

Testing Agency's Signature: _____

District Inspector's Signature: _____

SEPARATE CERTIFICATE IS REQUIRED FOR EACH SITE

CERTIFICATION OF CHLORINATION AND STERILIZATION

This certifies that _____ chlorinated the domestic hot and cold water plumbing lines for the **Art Freiler Elementary School - TK Portable Classroom Building, Tracy Unified** School District. The lines were first flushed and chlorine was injected in the main water line on _____, **2024**. A minimum chlorine residual of 50 ppm was measured at each outlet. The lines were tagged, secured and the make-up water was shut off. On _____, **2024**, (a minimum of 24 hours later) the chlorine residual was retested and found to contain a minimum of 50 ppm. The plumbing lines were then thoroughly flushed with fresh water until the chlorine residual was not greater than 0.2 ppm at all outlets. A Bacteriological Examination report has been provided.

District Inspector Signature: _____

Date _____

Name of Chlorination and Testing Firm: _____

Authorized Representative Signature: _____

Date _____

Name of General Contractor: _____

Authorized Representative Signature: _____

Date _____

CERTIFICATION OF COMPLIANCE FOR BUILDING MATERIALS

This is to certify, in accordance with the Environmental Protection Agency requirements, that the materials and equipment used in the construction of the **Art Freiler Elementary School - TK Portable Classroom Building** for the **Tracy Unified** School District of **San Joaquin** County, California, are asbestos free and are, therefore, not subject to monitoring for asbestos contamination.

Project Name: _____

Address: _____

Contractor: _____

Address: _____

Signature: _____

Title: _____

Date: _____

SEPARATE CERTIFICATE IS REQUIRED FOR EACH SITE

SITE STANDARDS

PART 1 – GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including without limitation, Site Access, Conditions, and Regulations;
- B. Special Conditions;
- C. Drug-Free Workplace Certification;
- D. Tobacco-Free Environment Certification;
- E. Criminal Background Investigation/Fingerprinting Certification;
- F. Temporary Facilities and Controls.

1.02 REQUIREMENTS OF THE DISTRICT:

- A. Drug-Free Schools and Safety Requirements:
 - (1) All school sites and other District Facilities have been declared "Drug-Free Zones." No drugs, alcohol and/or smoking are allowed at any time in any buildings and/or grounds on District property. No students, staff, visitors, or contractors are to use drugs on these sites.
 - (2) Smoking and the use of tobacco products by all persons is prohibited on or in District property. District property includes school buildings, school grounds, school-owned vehicles and vehicles owned by others while on District property. Contractor shall post: "Non-Smoking Area" in a highly visible location in each work area, staging area, and parking area. Contractor may designate a smoking area outside of District property within the public right-of-way, provided that this area remains quiet and unobtrusive to adjacent neighbors. This smoking area is to be kept clean at all times.
 - (3) Contractor shall ensure that no alcohol, firearms, weapons, or controlled substances enter or are used at the Site. Contractor shall immediately remove from the Site and terminate the employment of any employee(s) found in violation of this provision.
- B. Language: Profanity or other unacceptable and/or loud language will not be tolerated, "Cat calls" or other derogatory language toward students, staff, volunteers, parents or public will not be allowed.

C. Disturbing the Peace (Noise and Lighting):

- (1) Contractor shall observe the noise ordinance of the Site at all times including, without limitation, all applicable local, city, and/or state laws, ordinances, and/or regulations regarding noise and allowable noise levels.
- (2) The use of radios, etc., shall be controlled to keep all sound at a level that cannot be heard beyond the immediate area of use. District reserves the right to prohibit the use of radios at the Site, except for mobile phones or other handheld communication radios.
- (3) If portable lights are used after dark, all light must be located so as not to direct light into neighboring property.

D. Traffic:

- (1) Driving on the Premises shall be limited to periods when students and public are not present. If driving or deliveries must be made during the school hours, two (2) or more ground guides shall lead the vehicle across the area of travel. In no case shall driving take place across playgrounds or other pedestrian paths during recess, lunch, and/or class period changes. The speed limit on-the Premises shall be five (5) miles per hour (maximum) or less if conditions require.
- (2) All paths of travel for deliveries, including without limitation, material, equipment, and supply deliveries, shall be reviewed and approved by District in advance. Any damage will be repaired to the pre-damaged condition by the Contractor.
- (3) District shall designate a construction entry to the Site. If Contractor requests, District determines it is required, and to the extent possible, District shall designate a staging area so as not to interfere with the normal functioning of school facilities. Location of gates and fencing shall be approved in advance with District and at Contractor's expense.
- (4) Parking areas shall be reviewed and approved by District in advance. No parking is to occur under the drip line of trees or in softscape areas that could otherwise be damaged.

- E. All of the above shall be observed and complied with by the Contractor and all workers on the Site. Failure to follow these directives could result in individual(s) being suspended or removed from the work force at the discretion of the District. The same rules and regulations shall apply equally to delivery personnel, inspectors, consultants, and other visitors to the Site.

PART 2 - PRODUCTS Not Used.

PART 3 - EXECUTION Not Used.

END OF DOCUMENT

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Special environmental, sustainable, and “green” building practices related to indoor air quality, resource efficiency supplementing the Pollutant Control requirements specified under Section 01 8113.10, Sustainable Design Requirements, and to ensure healthy indoor air quality in final Project.
- B. Contractor is required to comply with sustainable building practices during construction and when considering materials for substitutions. Refer to Article “Design Requirements.”

1.2 RELATED REQUIREMENTS

- A. Section 01 6116, Volatile Organic Compound (VOC) Restrictions.
- B. Section 01 50 13, Construction Waste Management and Disposal.
- C. Section 01 8113, Sustainable Design Requirements.

1.3 ADMINISTRATIVE REQUIREMENTS

- A. Submittal Procedures:
 - 1. Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
 - 2. Sustainable Design Submittals shall comply with the additional requirement of Section 01 8113, Sustainable Design Requirements.
 - 3. Closeout Submittals shall be submitted in accordance with document 01 7700, Closeout Procedures.

1.4 DESIGN REQUIREMENTS

- A. Owner has established general environmental goals for design and for construction of the Project.
 - 1. In addition to the Contractor, the Contractor’s construction team, including subcontractors, suppliers, and manufacturers, are encouraged to participate where possible to realize the Owner’s environmental goals.
 - 2. Intent is for environmental goals to be achieved in a manner which ultimately provides a safe and healthy environment for building occupants with minimal impact on the local, regional and global environment.
- B. Environmental Goals:
 - 1. Refer to specific Specifications Sections for more detailed construction requirements related to specific materials and systems.

ENVIRONMENTAL PROCEDURES
SECTION 01 3543
3595001

1.5 INFORMATIONAL SUBMITTALS

A. Indoor Air Quality (IAQ) Data:

1. Environmental Issues: Submit emission test data produced by acceptable testing laboratory, listed in this Specification Article "Quality Assurance," for materials as required in each specific Specification Section.
 - a. Laboratory reports shall contain emissions test data on Volatile Organic Compounds (VOCs) including Total Volatile Organic Compounds (TVOC), specific individual VOCs, formaldehyde and other aldehydes as described in this Section.
 - b. Identify VOCs emitted by each material as required in these Specifications, and demonstrate compliance with the California Green Building Standards Code, edition current as of the date of this Contract.
 - c. Specific test conditions and requirements are set forth in the Specifications. For required tests, submit documentation of sample acquisition, handling, and test specimen preparation, as well as test conditions, methods, and procedures. The tests consist of a 10-day conditioning period followed by a 96-hour test period.
 - 1) Samples collected during the test period at 24, 48, and 96-hours shall be analyzed for TVOC and formaldehyde.
 - 2) VOC samples collected at 96 hours shall be identified and quantified for compounds that are found on the list of Chemicals of Concern. The Chemicals of Concern list is based on the California OEHHA list as of September 2002 (The most recent list shall be used for this Specification as published at:
 - a) http://www.oehha.org/air/chronic_rels/allChrels.html.
2. Cleaning and Maintenance Products: Provide data on manufacturers' recommended maintenance, cleaning, refinishing and disposal procedures for materials and products. These procedures are for final Contractor cleaning of the project prior to Substantial Completion and for provided materials and products as required by the specific Specification Sections.
 - a. Where chemical products are recommended for these procedures, provide documentation to indicate that no component present in the cleaning product at more than 1 percent of the total mass of the cleaning product is a carcinogen or reproductive toxicant as identified in the Chemicals of Concern list referenced above.
 - b. Avoid cleaning products containing alpha-pinene, d-limonene or other unsaturated carbon double bond alkenes due to chemical reactions with ozone to form aldehydes, acidic aerosols, and ultra-fine particulate matter in indoor air.

B. Certificates:

1. Prior to Final Completion, submit a certificate signed by corporate office holder of Contractor, subcontractor, supplier, vendor, installer or manufacturer primarily responsible for the manufacturing of the product, indicating materials provided are

essentially the same, and contain essentially the same components as products and materials tested.

2. Comply with requirements specified in Specification Section 01 7700, Closeout Procedures.

1.6 CLOSEOUT SUBMITTALS

- A. Submit data relating to Environmental Issues.
 1. Submit environmental product certifications, in two forms:
 - a. Two CD-ROMs organized by CSI Division Format.
 - b. Three three-ring binders organized by CSI Division Format with Table of Contents and with dividers for each Division.

1.7 QUALITY ASSURANCE

- A. Environmental Project Management and Coordination: Contractor to identify one person on Contractor's staff to be responsible for environmental issues compliance and coordination.
 1. Experience: Environmental project manager shall have experience relating to sustainable building construction.
 2. Responsibilities: Carefully review the Contract Documents for environmental issues, coordinate work of trades, subcontractors, and suppliers; instruct workers relating to environmental issues; and oversee Project Environmental Goals.
 3. Meetings: Discuss Environmental Goals at following meetings.
 - a. Pre-construction meeting.
 - b. Pre-installation meetings.
 - c. Regularly scheduled job-site meetings.
 - d. Special sustainability issues meetings.
- B. Environmental Issues Criteria: Comply with requirements listed in the Specification Sections.
- C. Acceptable Indoor Air Emissions Testing Laboratories:
 1. Selection of testing laboratories shall include assessment of prior experience in conducting indoor source emissions tests.
 2. The proposed laboratory shall be an independent company or organization not related to the manufacturer of the products to be tested.
 3. Submit documentation on proposed laboratory for review and approval by Owner.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Packaging: Deliver materials in recyclable or in reusable packaging such as cardboard, wood, paper, or reusable blankets, which will be reclaimed by supplier or manufacturer for recycling.

ENVIRONMENTAL PROCEDURES

SECTION 01 3543

3595001

1. Minimize packaging materials to maximum extent possible while still ensuring protection of materials during delivery, storage, and handling.
 2. Unacceptable Packaging Materials: Polyurethane, polyisocyanate, polystyrene, polyethylene, and similar plastic materials such as “foam” plastics and “shrink-fit” plastics.
 3. Reusable Blankets: Deliver and store materials in reusable blankets and mats reclaimed by the manufacturers or suppliers for reuse where the reclamation program exists or where a program can be developed for such reuse.
 4. Pallets: Where pallets are used, suppliers shall be responsible to ensure pallets are removed from site for reuse or for recycling.
 5. Corrugated Cardboard and Paper: Where paper products are used, recycle as part of the construction waste management recycling program, or return to the material’s manufacturer for use by the manufacturer or supplier.
 6. Sealants, Paint, Primers, Adhesives, and Coating Containers: Return to the supplier or manufacturer for reuse where such program is available.
- B. Comply with the additional requirements specified in Section 01 7419, Construction Waste Management and Disposal.

1.9 FIELD CONDITIONS

- A. No smoking will be permitted in indoor Project site locations, in accordance with California Labor Code (Section 400-6413.5).
- B. Environmental Product Certification:
1. Include certification that indicates cleaning materials comply with requirements of these Specifications.
- C. Construction Ventilation and Preconditioning:
1. Temporary Construction Ventilation: Maintain sufficient temporary ventilation of areas where materials are being used that emit VOCs. Maintain ventilation continuously during installation, and until emissions dissipate following installation. If continuous ventilation is not possible utilizing the building’s HVAC system(s) then ventilation shall be supplied using open windows and temporary fans, sufficient to provide no less than three air changes per hour.
 - a. Period after installation shall be sufficient to dissipate odors and elevated concentrations of VOCs. Where no specific period is stated in these Specifications, a time period of 72 hours shall be used.
 - b. Ventilate areas directly to outside; ventilation to other enclosed areas is not acceptable.
 2. During dust producing activities, including drywall installation and finishing, turn ventilation system off, and openings in supply and return HVAC system shall be protected from dust infiltration. Provide temporary ventilation as required.
 3. Preconditioning: Prior to installation, allow products which have odors and significant VOC emissions to off-gas in dry, well-ventilated space for 14 calendar days to allow for reasonable dissipation of odors and emissions prior to delivery to Project site and installation.

- a. Condition products without containers and packaging to maximize off-gassing of VOCs
- b. Condition products in ventilated warehouse or other building. Comply with substitution requirements for consideration of other locations.

D. Protection:

- 1. Moisture Stains: Materials with evidence of moisture damage, including stains, are not acceptable, including both stored and installed materials; immediately remove from site and properly dispose.
 - a. Take special care to prevent an accumulation of moisture on installed materials and within packaging during delivery, storage, and handling to prevent development of molds and mildew on packaging and on products
 - b. Immediately remove from site and properly dispose of materials showing signs of mold and signs of mildew, including materials with moisture stains.
 - c. Replace moldy materials with new, undamaged materials.
- 2. Ducts: Seal ducts during transportation, delivery, and construction to prevent accumulation of construction dust and construction debris inside of ducts.

PART 2 - PRODUCTS

2.1 SUBSTITUTIONS

- A. Requests for substitutions shall comply with requirements specified in Specification Section 01 3300, Submittals, and with the following additional information required where environmental issues are specified:
 - 1. Indicate how each proposed substitution complies with requirements for VOCs.
 - 2. Owner, in consultation with Architect reserve the right to reject proposed substitutions where data for VOCs is not provided or where emissions of individual VOCs are higher than for the specified materials.
 - 3. Comply with the specified recycled content and other environmental requirements.

PART 3 - EXECUTION

3.1 FIELD QUALITY CONTROL

- A. Sequencing:
 - 1. On-Site Application: Where odorous and/or high VOC emitting products are applied on-site, apply prior to installation of porous and fibrous materials. Where this is not possible, protect porous materials with polyethylene vapor retarders.
 - 2. Complete interior finish material installation no less than 14 days prior to Substantial Completion to allow for Building Flush Out as described in Paragraph 3.1B.

ENVIRONMENTAL PROCEDURES

SECTION 01 3543

3595001

- B. Building Flush Out: Just prior to Substantial Completion, flush out building air continuously using maximum tempered outside air, or maximum amount of outside air while achieving reasonable indoor temperature, for at least 14 calendar days. Continuously is defined as 24 hours per day, 7 days a week. If interruptions of more than a few hours are required for testing and balancing purposes, extend flush out period accordingly in order to achieve the minimum 14 calendar day building flush out period.
 - 1. When Contractor is required to perform touch-up work, provide temporary construction ventilation during installation and extend building flush-out by a minimum of 4 calendar days after touch-up installation is complete with maximum tempered outside air for 24 hours per day.
 - 2. If construction schedule permits, extend flush-out period beyond minimum building flush out period for an additional 15 days.
 - 3. Return ventilation system to normal operation following flush-out period to minimize energy consumption.

3.2 CLEANING

- A. Clean interior and exterior surfaces exposed to view; remove temporary labels, stains, and foreign substances; polish transparent and glossy surfaces using cleaning and maintenance products that conform to standards as described in Part 1 of this Section.
- B. Clean equipment and fixtures to sanitary condition using cleaning and maintenance products that conform to standards as described in Part 1 of this Section.
- C. Products used for cleaning shall comply with Proposition 65 and the additional restrictions for volatile organic compounds specified in Section 01 6116.
- D. Vacuum carpeted and soft surfaces with high efficiency particulate arrestor (HEPA) vacuum.
- E. If ducts were not sealed during construction, and contain dust or dirt, clean ducts using HEPA vacuum immediately prior to Substantial Completion and prior to using ducts to circulate air. Oil film on sheet metal shall be removed before shipment to site. Ducts shall be inspected to confirm that no oil film is present. Remove oil film.
- F. Replace air filters, both pre and final filters, just prior to Substantial Completion.
- G. Remove and properly dispose of recyclable materials using construction waste management program described in Section 01 7419, Construction Waste Management and Disposal.

3.3 PROTECTION

- A. Protect interior materials from water intrusion or penetration where interior products are not intended for wet applications and are exposed to moisture.
- B. Protect installed products using methods that do not support growth of mold and mildew.
 - 1. Immediately remove from site materials with mold or mildew.

END OF SECTION

*p:\sacramento\3595 tracy unified school district\001-000_villalovoz es new shade structures\08 specifications\06 spec\04
final\freiler\01 3543_environmental procedures.docx*

REGULATORY REQUIREMENTS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Obtaining of Permits, Licenses and Registrations and Work to Comply with All Applicable Laws and Regulations;
- B. Special Conditions; and
- C. Quality Control.

1.02 DESCRIPTION:

This section covers the general requirements for regulatory requirements pertaining to the Work and is supplementary to all other regulatory requirements mentioned or referenced elsewhere in the Contract Documents.

1.03 REQUIREMENTS OF REGULATORY AGENCIES:

- A. All statutes, ordinances, laws, rules, codes, regulations, standards, and the lawful orders of all public authorities having jurisdiction over the Work, are hereby incorporated into these Contract Documents as if repeated in full herein and are intended to be included in any reference to Code or Building Code, unless otherwise specified, including, without limitation, the references in the list below. Contractor shall make available at the Site copies of all the listed documents applicable to the Work as the District and/or Architect may request, including, without limitation, applicable portions of the California Code of Regulations ("CCR").
 - (1) California Building Standards Administrative Code, Part 1, Title 24, CCR.
 - (2) California Building Code (CBC), Part 2, Title 24, CCR; (International Building Code volumes 1-2 and California Amendments).
 - (3) California Electrical Code (CEC), Part 3, Title 24, CCR; (National Electrical Code and California Amendments).
 - (4) California Mechanical Code (CMC), Part 4, Title 24, CCR; (Uniform Mechanical Code and California Amendments).
 - (5) California Plumbing Code (CPC), Part 5, Title 24, CCR; (Uniform Plumbing Code and California Amendments).

- (6) California Fire Code (CFC), Part 9, Title 24, CCR; (International Fire Code and California Amendments).
- (7) California Green Building Standards Code (CALGreen), Part 11, Title 24, CCR.
- (8) California Referenced Standards Code, Part 12, Title 24, CCR.
- (9) State Fire Marshal Regulations, Public Safety, Title 19, CCR.
- (10) Partial List of Applicable National Fire Protection Association (NFPA) Standards:
 - (a) NFPA 13 - Automatic Sprinkler System.
 - (b) NFPA 14 - Standpipes Systems.
 - (c) NFPA 17A - Wet Chemical System
 - (d) NFPA 24 - Private Fire Mains.
 - (e) (California Amended) NFPA 72 - National Fire Alarm Codes.
 - (f) NFPA 253 - Critical Radiant Flux of Floor Covering System.
 - (g) NFPA 2001 - Clean Agent Fire Extinguishing Systems.
- (11) California Division of the State Architect interpretation of Regulations ("DSA IR"), including, without limitation:
 - (a) DSA IR A-6 — Construction Change Document Submittal and Approval Processes.
 - (b) DSA IR A-7 — Project Inspector Certification and Approval.
 - (c) DSA IR A-8 — Project Inspector and Assistant Inspector Duties and Performance.
 - (d) DSA IR A-12 — Assistant Inspector Approval.
- (12) DSA Procedures ("DSA PR")
 - (a) DSA PR 13-01 – Construction Oversight Process
 - (b) DSA PR 13-02 – Project Certification Process

B. This Project shall be governed by applicable regulations, including, without limitation, the State of California's Administrative Regulations for the Division of the State Architect-Structural Safety (DSA/SS), Chapter 4, Part 1, Title 24, CCR, and the most current version on the date the bids are opened and as it pertains to school construction including, without limitation:

- (1) Test and testing laboratory per Section 4-335. District shall pay for the testing laboratory.
- (2) Special inspections per Section 4-333(c).
- (3) Deferred Approvals per section 4-317(g).
- (4) Verified reports per Sections 4-336 & 4-343(c).
- (5) Duties of the Architect & Engineers shall be per Sections 4-333(a) and 4-341.
- (6) Duties of the Contractor shall be per Section 4-343.
- (7) Duties of Project Inspector shall be per Section 4-334.
- (8) Addenda and Construction Change Documents per Section 4-338.

Contractor shall keep and make available all applicable parts of the most current version of Title 24 referred to in the plans and specifications at the Site during construction.

C. Items of deferred approval shall be clearly marked on the first sheet of the Architect's and/or Engineer's approved Drawings. All items later submitted for approval shall be per Title 24 requirements to the DSA.

- (1) Contractor shall submit the following to Architect for review and endorsement:
 - (a) Product information on proposed material/system supplier.
 - (b) Drawings, specifications, and calculations prepared, signed, and stamped by an architect or engineer licensed in the State of California for that portion of the Work.
 - (c) All other requirements as may be required by DSA.
- (2) Cost of preparing and submitting documentation per DSA Deferred Approval requirements including required modifications to Drawings and Specifications, whether or not indicated in the Contract Documents, shall be borne by Contractor.
- (3) Contractor shall not begin fabrication and installation of deferred approval items without first obtaining DSA approval of Drawings and Specifications.
- (4) Schedule of Work Subject to DSA Deferred Approval: Window wall systems exceeding 10 feet in span.

PART 2 – PRODUCTS Not Used.

PART 3 – EXECUTION Not Used.

END OF DOCUMENT

ABBREVIATIONS AND ACRONYMS

PART 1 – GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions including without limitation, Definitions;
- B. Special Conditions.

1.02 DOCUMENT INCLUDES:

- A. Abbreviations used throughout the Contract Documents.
- B. Reference to a technical society, organization, or body is by abbreviation, as follows:

1.	AA	The Aluminum Association
2.	AASHTO	American Association of State Highway and Transportation Officials
3.	ABPA	Acoustical and Board Products Association
4.	ACI	American Concrete Institute
5.	AGA	American Gas Association
6.	AGC	Associated General Contractors of America
7.	AHC	Architectural Hardware Consultant
8.	AHRI	Air Conditioning, Heating, Refrigeration Institute
9.	AI	Asphalt Institute
10.	AIA	American Institute of Architects
11.	AISC	American Institute of Steel Construction
12.	AISI	American Iron and Steel Institute
13.	AMCA	Air Movement and Control Association
14.	ANSI	American National Standards Institute
15.	APA	APA – The Engineered Wood Association
16.	ASCE	American Society of Civil Engineers
17.	ASHRAE	American Society of Heating, Refrigeration and Air Conditioning Engineers
18.	ASME	American Society of Mechanical Engineers
19.	ASTM	American Society of Testing and Materials International
20.	AWPA	American Wood Protection Association
21.	AWPI	American Wood Preservers Institute
22.	AWS	American Welding Society
23.	AWSC	American Welding Society Code
24.	AWI	Architectural Woodwork Institute
25.	AWWA	American Water Works Association
26.	BIA	The Brick Industry Association

27.	CCR	California Code of Regulations
28.	CLFMI	Chain Link Fence Manufacturers Institute
29.	CRA	California Redwood Association
30.	CRSI	Concrete Reinforcing Steel Institute
31.	CS	Commercial Standards
32.	CSI	Construction Specifications Institute
33.	CTI	Cooling Technology Institute
34.	FGIA	Fenestration and Glazing Industry Alliance
35.	FGMA	Flat Glass Manufacturers' Association
36.	FIA	Factory Insurance Association
37.	FM	Factory Mutual Global
38.	FS/FED SPEC	Federal Specification
39.	FTI	Facing Title Institute
40.	GA	Gypsum Association
41.	IAPMO	International Association of Plumbing and Mechanical Officials
42.	ICC	International Code Council
43.	IEEE	Institute of Electrical and Electronics Engineers
44.	IES	Illuminating Engineering Society
45.	MCAC	Mason Contractors Association of California
46.	MIMA	Mineral Wool Insulation Manufacturers Association
47.	MLMA	Metal Lath Manufacturers Association
48.	MS/MIL SPEC	Military Specifications
49.	NAAMM	National Association of Architectural Metal Manufacturers
50.	NBHA	National Builders Hardware Association
51.	NCMA	National Concrete Masonry Association
52.	NCSEA	National Council of Structural Engineers Associations
53.	NEC	National Electrical Code
54.	NEMA	National Electrical Manufacturers Association
55.	NIST	National Institute of Standards and Technology
56.	NSI	Natural Stone Institute
57.	NTMA	National Terrazzo and Mosaic Association, Inc.
58.	ORS	Office of Regulatory Services (California)
59.	OSHA	Occupational Safety and Health Act
60.	PCI	Precast/Prestressed Concrete Institute
61.	PCA	Portland Cement Association
62.	PCA	Painting Contractors Association
63.	PDI	Plumbing Drainage Institute
64.	PEI	Porcelain Enamel Institute, Inc.
65.	PG&E	Pacific Gas & Electric Company
66.	PS	Product Standards
67.	SDI	Steel Door Institute; Steel Deck Institute
68.	SJI	Steel Joist Institute
69.	SSPC	Society for Protective Coatings
70.	TCNA	Tile Council of North America, Inc.
71.	TPI	Truss Plate Institute
72.	UBC	Uniform Building Code
73.	UL	Underwriters Laboratories Code

74.	UMC	Uniform Mechanical Code
75.	USDA	United States Department of Agriculture
76.	VI	Vermiculite Institute
77.	WCLIB	West Coast Lumber Inspection Bureau
78.	WDMA	Window and Door Manufacturers Association
79.	WEUSER	Western Electric Utilities Service Engineering Requirements
80.	WIC	Woodwork Institute of California

PART 2 - PRODUCTS Not Used.

PART 3 - EXECUTION Not Used.

END OF DOCUMENT

DEFINITIONS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions including without limitation, Definitions;
- B. Special Conditions.

1.02 QUALITY ASSURANCE

- A. For products or workmanship specified by association, trade, or Federal Standards, Contractor shall comply with requirements of the standard, except when more rigid requirements are specified in the Contract Documents, or are required by applicable codes.
- B. Contractor shall conform to current reference standard publication date in effect on the date of bid opening.
- C. Contractor shall obtain copies of standards unless specifically required not to by the Contract Documents.
- D. Contractor shall maintain a copy of all standards at jobsite during submittals, planning, and progress of the specific Work, until final completion, unless specifically required not to by the Contract Documents.
- E. Should specified reference standards conflict with Contract Documents, Contractor shall request clarification from the District and/or the Architect before proceeding.
- F. The contractual relationship of the parties to the Contract shall not be altered from the contractual relationship as indicated in the Contract Documents by mention or inference otherwise in any referenced document.
- G. Governing Codes shall be as shown in the Contract Documents including, without limitation, the Specifications.

END OF DOCUMENT

REFERENCES**PART 1 - GENERAL****1.01 SCHEDULE OF REFERENCES:**

The following information is intended only for the general assistance of the Contractor, and the District does not represent that all of the information is current. It is the Contractor's responsibility to verify the correct information for each of the entities listed.

AA	The Aluminum Association 1400 Crystal Drive, Suite 430 Arlington, VA 22202 www.aluminum.org	703/358-2960
AABC	Associated Air Balance Council 2401 Pennsylvania Avenue NW, Suite 330 Washington, DC 20037 www.aabc.com	202/737-0202
AASHTO	American Association of State Highway and Transportation Officials 555 12th St. NW - Suite 1000 Washington, DC 20004 www.transportation.org	202/624-5800
AATCC	American Association of Textile Chemists and Colorists P.O. Box 12215 Research Triangle Park, NC 27709-2215 www.aatcc.org	919/549-8141
ACA	American Coatings Association 901 New York Ave., NW, Suite 300 West Washington, DC 20001 www.paint.org	202/462-6272
ACI	American Concrete Institute 38800 Country Club Dr. Farmington Hills, MI 48331-3439 www.concrete.org	248/848-3800
ACPA	American Concrete Pipe Association 5605 N. MacArthur Blvd., Suite 340 Irving, TX 75038 www.concrete-pipe.org	972/506-7216

ADC	Air Duct Council 1901 N. Roselle Road, Suite 800 Schaumburg, IL 60195 www.flexibleduct.org	847/706-6750
AF&PA	American Forest and Paper Association 1101 K Street, NW, Suite 700 Washington, DC 20005 www.afandpa.org	202/463-2700
AGA	American Gas Association 400 North Capitol Street, NW, Suite 450 Washington, DC 20001 www.aga.org	202/824-7000
AGC	Associate General Contractors of America 2300 Wilson Blvd., Suite 300 Arlington, VA 22201 www.agc.org	703/548-3118
AHA	American Hardboard Association 1210 West Northwest Highway Palatine, IL 60067 http://domensino.com/AHA/default.htm	847/934-8800
AI	Asphalt Institute 2696 Research Park Drive Lexington, KY 40511-8480 www.asphaltinstitute.org	859/288-4960
AIA	The American Institute of Architects 1735 New York Ave., NW Washington, DC 20006-5292 www.aia.org	202/626-7300
AISC	American Institute of Steel Construction 130 East Randolph Street, Suite 2000 Chicago, IL 60601 www.aisc.org	312.670.2400
AISI	American Iron and Steel Institute 25 Massachusetts Ave., NW, Suite 800 Washington, DC 20001 www.steel.org	202/452-7100
AITC	American Institute of Timber Construction 1010 South 336th Street, #210 Federal Way, WA 98003-7394 https://www.plib.org/aitc/	253/835-3344

ALI	Associated Laboratories, Inc. P.O. Box 152837 Dallas, TX 75315 www.assoc-labs.com	214/565-0593
ALSC	American Lumber Standards Committee, Inc. 7470 New Technology Way, Suite F Frederick, MD 21703 www.alsc.org	301/972-1700
AMCA	Air Movement and Control Association International, Inc. 30 W. University Drive Arlington Heights, IL 60004 www.amca.org	847/394-0150
AMPP (formerly SSPC)	Association for Materials Protection and Performance (merger of Society for Protective Coatings and National Association of Corrosion Engineers International) (formerly Steel Structures Painting Council) 800 Trumbull Drive Pittsburgh, PA 15205 www.sspc.org	412/281-2331 877/281-7772
ANLA	AmericanHort (merger of American Nursery & Landscape Association and OFA – The Association of Horticultural Professionals) 2130 Stella Court Columbus, OH 43215 www.americanhort.org	614/487-1117
ANSI	American National Standards Institute 1899 L Street, NW, 11th Floor Washington, DC 20036 www.ansi.org	202/293-8020
APA	APA-The Engineered Wood Association 7011 S. 19th Street Tacoma, WA 98466-5333 www.apawood.org	253/565-6600

APA	Architectural Precast Association 325 John Knox Rd, Suite L-103 Tallahassee, FL 32303 www.archprecast.org	850/205-5637
APCIA	American Property Casualty Insurance Association (merger of American Insurance Association (formerly the National Board of Fire Underwriters) with the Property Casualty Insurers Association of America) 555 12th St, NW, Suite 550 Washington DC 20004 www.apci.org	202/828-7100
AHRI	Air Conditioning and Refrigeration Institute (now Air-Conditioning, Heating, & Refrigeration Institute) 2311 Wilson Blvd, Suite 400 Arlington, VA 22201 www.ahrinet.org	703/524-8800
ARMA	Asphalt Roofing Manufacturers Association 2331 Rock Spring Road Forest Hill, MD 21050 www.asphaltroofing.org	443/640-1075
ASA	The Acoustical Society of America Suite 300 1305 Walt Whitman Road Melville, NY 11747-4300 https://acousticalsociety.org/	516/576-2360
ASCE	American Society of Civil Engineers 1801 Alexander Bell Drive Reston, VA 20191 www.asce.org	800/548-2723 703/295-6300
ASHRAE	American Society of Heating, Refrigerating and Air Conditioning Engineers 180 Technology Parkway Peachtree Corners, GA 30092 www.ashrae.org	800/527-4723 404/636-8400
ASLA	American Society of Landscape Architects 636 Eye Street, NW Washington, DC 20001-3736 www.asla.org	202/898-2444
ASME	American Society of Mechanical Engineers Two Park Avenue New York, NY 10016-5990 www.asme.org	800/834-2763

ASPE	American Society of Plumbing Engineers 6400 Shafer Court, Suite 350 Rosemont, IL 60018 http://aspe.org	847/296-0002
ASQ	American Society for Quality P.O. Box 3005 Milwaukee, WI 53201-3005 or 600 North Plankinton Avenue Milwaukee, WI 53203 http://asq.org	800/248-1946 414/272-8575
ASSE	American Society of Sanitary Engineering 18927 Hickory Creek Dr., Suite 220 Mokena, IL 60448 www.asse-plumbing.org	708/995-3019
ASTM	ASTM International 100 Barr Harbor Drive PO Box C700 West Conshohocken, PA, 19428-2959 www.astm.org	610/832-9500
AWCI	Association of the Wall and Ceiling Industry 513 West Broad Street, Suite 210 Falls Church, VA 22046 www.awci.org	703/538-1600
AWPA	American Wood Protection Association (formerly American Wood Preservers Institute) P.O. Box 361784 Birmingham, AL 35236-1784 www.awpa.com	205/733-4077
AWS	American Welding Society 8669 NW 36 Street, Suite 130 Miami, FL 33166 www.aws.org	800/443-9353 305/443-9353
AWI	Architectural Woodwork Institute 46179 Westlake Drive, Suite 120 Potomac Falls, VA 20165-5874 www.awinet.org	571/323-3636
AWWA	American Water Works Association 6666 West Quincy Avenue Denver, CO 80235 www.awwa.org	800/926-7337 303/794-7711

BHMA	Builders Hardware Manufacturers Association 355 Lexington Avenue, 15th Floor New York, NY 10017 www.buildershardware.com	212/297-2122
BIA	The Brick Industry Association 12007 Sunrise Valley Drive, Suite 430 Reston, VA 20191 www.gobrick.com	703/620-0010
CGA	Compressed Gas Association 8484 Westpark Drive, Suite 220 McLean, VA 22102 www.cganet.com	703/788-2700
CISCA	Ceilings & Interior Systems Construction Association 1010 Jorie Blvd, Suite 30 Oak Brook, IL 60523 www.cisca.org	630/584-1919
CISPI	Cast Iron Soil Pipe Institute 2401 Fieldcrest Dr. Mundelein, IL 60060 www.cispi.org	224/864-2910
CLFMI	Chain Link Fence Manufacturers Institute 10015 Old Columbia Road, Suite B-215 Columbia, MD 21046 chainlinkinfo.org	301/596-2583
CPA	Composite Panel Association 19465 Deerfield Avenue, Suite 306 Leesburg, VA 20176 www.compositepanel.org	703/724-1128
CPSC	Consumer Product Safety Commission 4330 East-West Highway Bethesda, MD 20814 www.cpsc.gov	800/638-2772
CRA	California Redwood Association 818 Grayson Road, Suite 201 Pleasant Hill, CA 94523 www.calredwood.org	925/935-1499

CRI	Carpet and Rug Institute 100 S. Hamilton Street Dalton, GA 30722-2048 www.carpet-rug.org	706/278-3176
CRSI	Concrete Reinforcing Steel Institute 933 N. Plum Grove Road Schaumburg, IL 60173-4758 www.crsi.org	847/517-1200
CSI	The Construction Specifications Institute 123 North Pitt St, Suite 450 Alexandria, VA 22314 www.csinet.org	800/689-2900
CTIOA	Ceramic Tile Institute of America 12061 Jefferson Blvd. Culver City, CA 90230-6219 www.ctioa.org	310/574-7800
DHA	Decorative Hardwoods Association (formerly Hardwood Plywood & Veneer Association) 42777 Trade West Dr. Sterling, VA 20166 https://www.decorativehardwoods.org/	703/435-2900
DHI	Door and Hardware Institute (formerly National Builders Hardware Association) 2001 K Street NW, 3rd Floor North Washington, DC 20006 www.dhi.org	202/367-1134
DIPRA	Ductile Iron Pipe Research Association P.O. Box 190306 Birmingham, AL 35219 www.dipra.org	205/402-8700
DOC	U.S. Department of Commerce 1401 Constitution Ave., NW Washington, DC 20230 www.commerce.gov	202/482-2000
DOT	U.S. Department of Transportation 1200 New Jersey Avenue, SE Washington, DC 20590 www.dot.gov	855/368-4200
EJMA	Expansion Joint Manufacturers Association, Inc. 25 North Broadway Tarrytown, NY 10591 www.ejma.org	914/332-0040

EPA	Environmental Protection Agency Ariel Rios Building 1200 Pennsylvania Avenue, N.W. Washington, DC 20460 www.epa.gov	202/272-0167
FCICA	Floor Covering Installation Contractors Association 800 Roosevelt Rd., Bldg. C, Suite 312 Glen Ellyn, IL 60137 www.fcica.com	630/672-3702
FGIA	Fenestration and Glazing Industry Alliance 1900 E Golf Rd, Suite 1250 Schaumburg, IL 60173 https://fgiaonline.org/	847/303-5664
FM Global	Factory Mutual Insurance Company Amy Daley Global Practice Leader – Education, Public Entities, Health Care FM Global 270 Central Avenue Johnston, RI 02919-4949 www.fmglobal.com	401/275-3000 401/275-3029
FS	General Services Administration (GSA) Index of Federal Specifications, Standards and Commercial Item Descriptions 470 East L'Enfant Plaza, SW, Suite 8100 Washington, DC 20407 www.gsa.gov	202/619-8925
GA	The Gypsum Association 962 Wayne Ave., Suite 620 Silver Spring, MD 20910 www.gypsum.org	301/277-8686
HMA	Hardwood Manufacturers Association One Williamsburg Place, Suite 108 Warrendale, PA 15086 http://hmamembers.org	412/244-0440

IAPMO	International Association of Plumbing and Mechanical Officials (formerly the Western Plumbing Officials Association) 4755 E. Philadelphia St. Ontario, CA 91761 www.iapmo.org	909/472-4100
ICC	International Code Council 500 New Jersey Avenue, NW, 6th Floor Washington, DC 20001 www.iccsafe.org	888/422-7233
IEEE	Institute of Electrical and Electronics Engineers 3 Park Avenue, 17th Floor New York, NY 10016-5997 www.ieee.org	212/419-7900
IES	Illuminating Engineering Society 120 Wall Street, Floor 17 New York, NY 10005-4001 www.ies.org	212/248-5000
ITRK	Intertek Testing Services 3933 US Route 11 Cortland, NY 13045 www.intertek.com	607/753-6711
MCAA	Mechanical Contractors Association of America 1385 Piccard Drive Rockville, MD 20850 www.mcaa.org	301/869-5800
MMPA (formerly WMMPA)	Moulding & Millwork Producers Association (formerly Wood Moulding & Millwork Producers Association) 507 First Street Woodland, CA 95695 www.wmmpa.com	530/661-9591 800/550-7889
MSS	Manufacturers Standardization Society (MSS) of the Valve and Fittings Industry, Inc. 127 Park Street, NE Vienna, VA 22180-4602 http://mss-hq.org	703/281-6613
NAAMM	National Association of Architectural Metal Manufacturers 800 Roosevelt Rd. Bldg. C, Suite 312 Glen Ellyn, IL 60137 www.naamm.org	630/942-6591

NAIMA	North American Insulation Manufacturers Association P.O. Box 1906 Alexandria, VA 22313 https://insulationinstitute.org/	703/684-0084
NALP	National Association of Landscape Professionals (formerly Professional Landcare Network) 12500 Fair Lakes Circle, Suite 200 Fairfax, VA 22033 https://www.landscapeprofessionals.org/	703/736-9666
NAPA	National Asphalt Pavement Association 6406 Ivy Lane, Suite 350 Greenbelt, MD 20770-1441 www.asphaltpavement.org	888/468-6499 301/731-4748
NCSPA	National Corrugated Steel Pipe Association 14070 Proton Road, Suite 100 Dallas, TX 75244 www.ncspa.org	972/850-1907
NCMA	National Concrete Masonry Association 13750 Sunrise Valley Drive Herndon, VA 20171-4662 www.ncma.org	703/713-1900
NEBB	National Environmental Balancing Bureau 8575 Grovemont Circle Gaithersburg, MD 20877 www.nebb.org	301/977-3698
NECA	National Electrical Contractors Association 1201 Pennsylvania Ave. NW Washington, D.C., 20004 www.necanet.org	202/991-6300
NEMA	National Electrical Manufacturers Association 1300 North 17th Street N, Suite 900 Rosslyn, VA 22209 www.nema.org	703/841-3200
NEII	National Elevator Industry, Inc. 5537 SW Urish Road Topeka, KS 66610 https://nationalelevatorindustry.org/	703/589-9985
NFPA	National Fire Protection Association 1 Batterymarch Park Quincy, MA 02169-7471 www.nfpa.org	800/344-3555 855/274-8525

NGA (formerly GANA)	National Glass Association (merged with Glass Association of North America) 1945 Old Gallows Road Suite 750 Vienna, VA 22182 www.glass.org	866/342-5642 Ext 127
NHLA	National Hardwood Lumber Association PO Box 34518 Memphis, TN 38184 www.nhla.com	901/377-1818
NIA	National Insulation Association 516 Herndon Pkwy., Ste. D Herndon, VA 20170 www.insulation.org	703/464-6422
NRCA	National Roofing Contractors Association 10255 W. Higgins Road, Suite 600 Rosemont, IL 60018-5607 www.nrca.net	847/299-9070
NSF	NSF International 789 N. Dixboro Road Ann Arbor, MI 48113-0140 www.nsf.org	800/673-6275 734/769-8010
NSI	Natural Stone Institute (formerly Marble Institute of America) 380 E. Lorain St. Oberlin, OH 44074 https://www.naturalstoneinstitute.org/	440/250-9222
NTMA	National Terrazzo and Mosaic Association 209 N. Crockett Street, Suite 2 PO Box 2605 Fredericksburg, TX 78624 www.ntma.com	800/323-9736
OSHA	Occupational Safety and Health Act U.S. Department of Labor Occupational Safety & Health Administration 200 Constitution Ave., NW Washington, DC 20210 www.osha.gov	800/321-OSHA (6742)

PCA	Portland Cement Association 5420 Old Orchard Road Skokie, IL 60077 or 200 Massachusetts Ave NW, Suite 200 Washington, DC 20001 www.cement.org	847/966-6200 202/408-9494
PCA	Painting Contractors Association (formerly Painting and Decorating Contractors of America) 2316 Millpark Drive Maryland Heights, MO 63043 https://www.pcapainted.org/	800/322-7322
PCI	Precast/Prestressed Concrete Institute 8770 W. Bryn Mawr Ave., Suite 1150 Chicago, IL 60631 www.pci.org	312/786-0300
PDI	Plumbing & Drainage Institute 800 Turnpike Street, Suite 300 North Andover, MA 01845 http://pdionline.org	978/557-0720 800/589-8956
PEI	Porcelain Enamel Institute, Inc. P.O. Box 920220 Norcross, GA 30010 www.porcelainenamel.com	770/676-9366
PG&E	Pacific Gas & Electric Company P.O. Box 997300 Sacramento, CA 95899-7300 www.pge.com	800/743-5000
PLIB	Pacific Lumber Inspection Bureau (formerly West Coast Lumber Inspection Bureau) 1010 South 336th Street, Suite 210 Federal Way, WA 98003-7394 https://www.plib.org/	253/835-3344
RFCI	Resilient Floor Covering Institute 115 Broad Street, Suite 201 La Grange, GA 30240 www.rfci.com	706/882-3833
SDI	Steel Deck Institute P.O. Box 426 Glenshaw, PA 15116 www.sdi.org	412/487-3325

SDI	Steel Door Institute 30200 Detroit Road Westlake, OH 44145 www.steeldoor.org	440/899-0010
SJI	Steel Joist Institute 140 West Evans Street, Suite 203 Florence, SC 29501 http://steeljoist.org	843/407-4091
SMA	Stucco Manufacturers Association 5753 E Santa Ana Cyn Rd, #G-156 Anaheim, CA 92807 www.stuccomfgassoc.com	714/473-9579
SMACNA	Sheet Metal and Air Conditioning Contractors' National Association 4201 Lafayette Center Drive Chantilly, VA 20151-1219 www.smacna.org	703/803-2980
SPI	SPI: The Plastics Industry Trade Association, Inc. 1425 K St. NW, Suite 500 Washington, DC 20005 www.plasticsindustry.org	202/974-5200
TCA	The Tile Council of North America 100 Clemson Research Blvd. Anderson, SC 29625 www.tcnatile.com	864/646-8453
TPI	Truss Plate Institute 2670 Crain Highway, Suite 203 Waldorf, MD 20601 www.tpinst.org	240/587-5582
TPI	Turfgrass Producers International 444 E. Roosevelt Road #346 Lombard, IL 60148 www.turfgrasssod.org	800/405-8873 847/649-5555
TCIA	Tree Care Industry Association (formerly the National Arborist Association) 670 N Commercial Street, Suite 201 Manchester, NH 03101 www.tcia.org	603/314-5380 800/733-2622

TVI	The Vermiculite Institute c/o The Schundler Company 10 Central Street Nahant, MA 01908 www.vermiculiteinstitute.org	732/287-2244
UL	Underwriters Laboratories Inc. 333 Pfingsten Road Northbrook, IL 60062-2096 www.ul.com	847/272-8800 877/854-3577
UNI	Uni-Bell PVC Pipe Association 201 E. John Carpenter Freeway, Suite 750 Irving, TX 75062 www.uni-bell.org	972/243-3902
USDA	U.S. Department of Agriculture 1400 Independence Ave., S.W. Washington, DC 20250 www.usda.gov	202/720-2791
WA	Wallcoverings Association 35 E Wacker Dr., Suite 850 Chicago, IL 60601 www.wallcoverings.org	312/224-2574
WCMA	Window Covering Manufacturers Association 355 Lexington Avenue 15th Floor New York, NY 10017 www.wcmanet.org	212/297-2122
WDMA	Window & Door Manufacturers Association 2001 K Street NW, 3rd Floor North Washington, D.C. 20006 www.wdma.com	202/367-1157
WI	Woodwork Institute 1455 Response Road, Suite 110 Sacramento, CA 95815 www.wicnet.org	916/372-9943
WRI	Wire Reinforcement Institute 942 Main Street, Suite 300 Hartford, CT 06103 www.wirereinforcementinstitute.org	860/240-9545
WWCA	Western Wall & Ceiling Contractors Association 1910 N. Lime St. Orange, CA 92865 www.wwcca.org	714/221-5520

WWPA	Western Wood Products Association (formerly Redwood Inspection Service) 1500 SW First Ave., Suite 870 Portland, OR 97201 www.wwpa.org	503/224-3930
------	--	--------------

PART 2 - PRODUCTS Not Used.

PART 3 - EXECUTION Not Used.

END OF DOCUMENT

MATERIALS AND EQUIPMENT

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Purchase of Materials and Equipment;
- B. Special Conditions;
- C. Imported Materials Certification.

1.02 MATERIAL AND EQUIPMENT

- A. Only items approved by the District and/or Design Professional shall be used.
- B. Contractor shall submit lists of products and other product information in accordance with the Contract Documents, including, without limitation, the provisions regarding the submittals.

1.03 MATERIAL AND EQUIPMENT COLORS

- A. The District and/or Architect will provide a schedule of colors.
- B. No individual color selections will be made until after approval of all pertinent materials and equipment and after receipt of appropriate samples in accordance with the Contract Documents, including, without limitation, the provisions regarding the submittals.
- C. Contractor shall request priority in writing for any item requiring advance ordering to maintain the approved Construction Schedule.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. Contractor shall deliver manufactured materials in original packages, containers, or bundles (with seals unbroken), bearing name or identification mark of manufacturer.
- B. Contractor shall deliver fabrications in as large assemblies as practicable; where specified as shop-primed or shop-finished, package or crate as required to preserve such priming or finish intact and free from abrasion.
- C. Contractor shall store materials in such a manner as necessary to properly protect them from damage. Materials or equipment damaged by handling, weather, dirt, or from any other cause will not be accepted.

- D. Materials are not acceptable that have been warehoused for long periods of time, stored or transported in improper environment, improperly packaged, inadequately labeled, poorly protected, excessively shipped, deviated from normal distribution pattern, or reassembled.
- E. Contractor shall store material so as to cause no obstructions of sidewalks, roadways, access to the Site or buildings, and underground services. Contractor shall protect material and equipment furnished under Contract.
- F. Contractor may store materials on Site with prior written approval by the District, all material shall remain under Contractor's control and Contractor shall remain liable for any damage to the materials. Should the Project Site not have storage area available, the Contractor shall provide for off-site storage at a bonded warehouse and with appropriate insurance coverage at no cost to District.
- G. When any room in Project is used as a shop or storeroom, the Contractor shall be responsible for any repairs, patching, or cleaning necessary due to that use. Location of storage space shall be subject to prior written approval by District.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Manufacturers listed in various sections of Contract Documents are names of those manufacturers that are believed to be capable of supplying one or more of items specified therein.
- B. The listing of a manufacturer does not imply that every product of that manufacturer is acceptable as meeting the requirements of the Contract Documents.

2.02 FACILITIES AND EQUIPMENT

Contractor shall provide, install, maintain, and operate a complete and adequate facility for handling, the execution, disposal, and distribution of material and equipment as required for proper and timely performance of Work connected with Contract.

2.03 MATERIAL REFERENCE STANDARDS

Where material is specified solely by reference to "standard specifications" and if requested by District, Contractor shall submit for review data on actual material proposed to be incorporated into Work of Contract listing name and address of vendor, manufacturer, or producer, and trade or brand names of those materials, and data substantiating compliance with standard specifications.

PART 3 - EXECUTION

3.01 WORKMANSHIP

- A. Where not more specifically described in any other Contract Documents, workmanship shall conform to methods and operations of best standards and accepted practices of trade or trades involved and shall include items of fabrication, construction, or installation regularly furnished or required for completion (including finish and for successful operation, as intended).
- B. Work shall be executed by tradespersons skilled in their respective lines of Work. When completed, parts shall have been durably and substantially built and present a neat appearance.

3.02 COORDINATION

- A. Contractor shall coordinate installation of Work so as to not interfere with installation of others. Adjustment or rework because of Contractor's failure to coordinate will be at no additional cost to District.
- B. Contractor shall examine in-place work for readiness, completeness, fitness to be concealed or to receive other work, and in compliance with Contract Documents. Concealing or covering Work constitutes acceptance of additional cost which will result should in-place Work be found unsuitable for receiving other Work or otherwise deviating from the requirements of the Contract Documents.

3.03 COMPLETENESS

Contractor shall provide all portions of the Work, unless clearly stated otherwise, installed complete and operational with all elements, accessories, anchorages, utility connections, etc., in manner to assure well-balanced performance, in accordance with manufacturer's recommendations and by Contract Documents. Terms such as "installed complete," "operable condition," "for use intended," "connected to all utilities," "terminate with proper cap," "adequately anchored," "patch and refinish," "to match similar," should be assumed to apply in all cases, except where completeness of functional or operable condition is specifically stated as not required.

3.04 APPROVED INSTALLER OR APPLICATOR

Installation by a manufacturer's approved installer or applicator is an understood part of Specifications and only approved installer or applicator is to provide on-site Work where specified manufacturer has on-going program of approving (i.e. certifying, bonding, re-warranting) installers or applicators. Newly established relationships between a manufacturer and an installer or applicator who does not have other approved applicator work in progress or completed is not approved for this Project.

3.05 MANUFACTURER'S RECOMMENDATIONS

All installations shall be in accordance with manufacturer's published recommendations and specific written directions of manufacturer's representative.

Should Contract Documents differ from recommendations of manufacturer or directions of his representative, Contractor shall analyze differences, make recommendations to the District and the Architect in writing, and shall not proceed until interpretation or clarification has been issued by the District and/or the Architect.

END OF DOCUMENT

QUALITY CONTROL

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Inspector, Inspections and Tests, Uncovering of Work and Non-conforming of Work and Correction of Work;
- B. Special Conditions.

1.02 RELATED CODES:

- A. The Work is governed by requirements of Title 24, California Code of Regulations ("CCR"), and the Contractor shall keep a copy of these available at the job Site for ready reference during construction.
- B. The Division of the State Architect ("DSA") shall be notified at or before the start of construction.

1.03 OBSERVATION AND SUPERVISION:

- A. The District and Architect or their appointed representatives will review the Work and the Contractor shall provide facilities and access to the Work at all times as required to facilitate this review. Administration by the Architect and any consulting Structural Engineer will be in accordance with applicable regulations, including, without limitation, CCR, Part 1, Title 24, Section 4-341.
- B. One or more Project Inspector(s) approved by DSA and employed by or in contract with the District, referred to hereinafter as the "Project Inspector", will observe the work in accordance with CCR, Part 1, Title 24, Sections 4-333(b) and 4-342:
 - (1) The Project Inspector and Special Inspector(s) shall have access to the Work wherever it is in preparation or progress for ascertaining that the Work is in accordance with the Contract Documents and all applicable code sections. The Contractor shall provide facilities and operation of equipment as needed, and access as required and shall provide assistance for sampling or measuring materials.
 - (2) The Project Inspector will notify the District and Architect and call the attention of the Contractor to any observed failure of Work or material to conform to Contract Documents.

The Contractor shall conform with all applicable laws as indicated in the Contract Documents, including, without limitation, to CCR, Part 1, Title 24, Section 4-343.

The Contractor shall supervise and direct the Work and maintain a competent superintendent on the job who is authorized to act in all matters pertaining to the Work. The Contractor's superintendent shall also inspect all materials, as they arrive, for compliance with the Contract Documents. Contractor shall reject defective Work or materials immediately upon delivery or failure of the Work or material to comply with the Contract Documents. The Contractor shall submit verified reports as indicated in the Contract Documents, including, without limitation, the Specifications and as required by Part 1, Title 24, Section 4-336.

1.04 TESTING AGENCIES:

- A. Testing agencies and tests shall be in conformance with the General Documents and the requirements of Part 1, Title 24, Section 4- 335.
- B. Testing and inspection in connection with earthwork shall be under the direction of the District's consulting soils engineer, if any, referred to hereinafter as the "Soils Engineer."
- C. Testing and inspection of construction materials and workmanship shall be performed by a qualified laboratory, referred to hereinafter as the "Testing Laboratory." The Testing Laboratory shall be under direction of an engineer registered in the State of California, shall conform to requirements of ASTM E329, and shall be employed by or in contract with the District.
- D. Testing laboratory shall be approved by the Architect and the Division of the State Architect.
- E. Owner will employ and pay for services of an independent testing labatory to perform specified inspection and testing. Retesting cost for failed test will be Contractors responsibilityand will be back-charged against the contract.

1.05 TESTS AND INSPECTIONS:

- A. The Contractor shall be responsible for notifying the District and Project Inspector of all required tests and inspections. Contractor shall notify the District and Project Inspector at least seventy-two hours (72) hours in advance of performing any Work requiring testing or inspection.
- B. The Contractor shall provide access to Work to be tested and furnish incidental labor, equipment, and facilities to facilitate all inspections and tests.
- C. The District will pay for first inspections and tests required by the "CCR", and other inspections or tests that the District and/or the Architect may direct to have made, including the following principal items:
 - (1) Tests and observations for earthwork and paving.
 - (2) Tests for concrete mix designs, including tests of trial batches.
 - (3) Tests and inspections for structural steel work.
 - (4) Field tests for framing lumber moisture content.

- (5) Additional tests directed by the District that establish that materials and installation comply with the Contract Documents.
 - (6) Tests and observations of welding and expansion anchors.
- D. The District may at its discretion, pay and then back charge the Contractor for:
 - (1) Retests or reinspections, if required, and tests or inspections required due to Contractor error or lack of required identifications of material.
 - (2) Uncovering of work in accordance with Contract Documents.
 - (3) Testing done on weekends, holidays, and overtime will be chargeable to the Contractor for the overtime portion.
 - (4) Testing done off Site.
- E. Testing and inspection reports and certifications:
 - (1) If initially received by Contractor, Contractor shall provide to each of the following a copy of the agency or laboratory report of each test or inspection or certification.
 - (a) The District;
 - (b) The Construction Manager, if any;
 - (c) The Architect;
 - (d) The Consulting Engineer, if any;
 - (e) Other engineers on the Project, as appropriate;
 - (f) The Project Inspector; and
 - (g) The Contractor.
 - (2) When the test or inspection is one required by the CCR, a copy of the report shall also be provided to the DSA.

1.06 LABORATORY REPORTS

- A. After each inspection and test, promptly submit two copies of laboratory report to Owner, Architect, Contractor and DSA.
- B. Include:
 - (1) Date of issue,
 - (2) DSA Application and File numbers,
 - (3) Project title and number,

- (4) Name of inspector,
 - (5) Date and time of sampling or inspection,
 - (6) Identification of product and Specification Section,
 - (7) Location in the Project,
 - (8) Type of inspection or test,
 - (9) Date of test,
 - (10) Results of test,
 - (11) Conformance with Contract Documents.
- C. When requested by Architect, provide interpretation of test results.

1.07 LIMITS ON TESTING LABORATORY AUTHORITY

- A. Laboratory may not release, revoke, alter or enlarge on requirements of Contract Documents.
- B. Laboratory may not approve or accept any portion of the work.
- C. Laboratory may not assume any duties of Contractor.
- D. Laboratory has no authority to stop the work.

PART 2 - PRODUCTS

2.01 TYPE OF TEST AND INSPECTIONS

- A. Testing and inspection shall be in accordance with DSA Form 103 (or current version)
- B. Slump Test
ASTM C 143
- C. Concrete Tests

Testing agency shall test concrete used in the work per the following paragraphs:

- (1) Compressive Strength:
 - (a) Minimum number of tests required: One (1) set of three (3) cylinders for each 100 cubic yards (Sec. 2604(h) 01) of concrete or major fraction thereof, placed in one (1) day. See Title 24, Section 2605(g).

- (b) Two cylinders of each set shall be tested at twenty-eight (28) days. One (1) cylinder shall be held in reserve and tested only when directed by the Architect or District.
- (c) Concrete shall test the minimum ultimate compressive strength in twenty-eight 28 days, as specified on the structural drawings.
- (d) In the event that the twenty-eight (28) day test falls below the minimum specified strength, the effective concrete in place shall be tested by taking cores in accordance with UBC Standard No. 26-13 and tested as required for cylinders.
- (e) In the event that the test on core specimens falls below the minimum specified strength, the concrete will be deemed defective and shall be removed and replaced upon such direction of the Architect, and in a manner acceptable to the Division of the State Architect.

D. Reinforcing, Steel

PART 3 - EXECUTION Not Used.

END OF DOCUMENT

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Requirements for Testing Laboratory.
 - 2. Contractor's responsibilities for facilitation of Testing and Inspections.

1.2 RELATED SECTIONS AND DOCUMENTS

- ~~A. Geologic Hazards & Soils Report.~~
- B. DSA 103 - Structural Test & Inspections List.
- C. Section 31 0000, Earthwork.
- D. Individual Specification Sections: Inspections and tests required, and standards for testing.

1.3 REFERENCES

- A. California Administrative Code (CAC), edition as noted on the drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Building Code (CBC), edition as noted on the drawings, as adopted by the California Division of the State Architect (DSA).

1.4 SELECTION AND PAYMENT

- A. Testing laboratory shall be approved by both the Architect and the Division of the State Architect.
- B. Owner will employ and pay for services of an independent testing laboratory to perform specified inspection and testing. Retesting costs for failed tests will be the Contractors responsibility and will be back-charged against the contract.
- C. Under provisions for Relocatable Building construction, Owner limits his exposure to in-plant inspection and testing costs. Refer to other Specification Sections related to such specific construction.
- D. Employment of testing laboratory shall in no way relieve Contractor of obligation to perform work in accordance with requirements of Contract Documents.

1.5 LABORATORY REPORTS

- A. After each inspection and test, promptly submit two copies of laboratory report to Owner, Architect, Contractor and DSA.
- B. Include:

TESTING AND INSPECTION SERVICES

SECTION 01 4523

3595001

1. Date of issue,
2. DSA Application and File numbers,
3. Project title and number,
4. Name of inspector,
5. Date and time of sampling or inspection,
6. Identification of product and Specification Section,
7. Location in the Project,
8. Type of inspection or test,
9. Date of test,
10. Results of test,
11. Conformance with Contract Documents.

C. When requested by Architect, provide interpretation of test results.

1.6 LIMITS ON TESTING LABORATORY AUTHORITY

- A. Laboratory may not release, revoke, alter or enlarge on requirements of Contract Documents.
- B. Laboratory may not approve or accept any portion of the work.
- C. Laboratory may not assume any duties of Contractor.
- D. Laboratory has no authority to stop the work.

1.7 CONTRACTOR RESPONSIBILITIES

- A. Deliver to laboratory at designated location, adequate samples of materials proposed to be used which require testing, along with proposed mix designs. Allow reasonable time for review and testing.
- B. Arrange for, and coordinate with, laboratory for all required testing and inspection. Provide adequate notice, in advance, for proper scheduling and processing of testing. The Inspector will not be responsible for scheduling or arranging for testing and inspection services.
- C. Cooperate with laboratory personnel, and provide access to the work and to manufacturer's facilities.
- D. Provide incidental labor and facilities to provide access to work to be tested, to obtain and handle samples at the site or at the source of products to be tested, to facilitate tests and inspections, storage and curing of test samples.
- E. Notify Architect, Inspector, Structural Engineer (when applicable) and laboratory 24 hours prior to expected time for operations requiring inspection and testing services.

END OF SECTION

TESTING AND INSPECTION SERVICES
SECTION 01 4523
3595001

*p:\sacramento\3595 tracy unified school district\001-000_villalovoz es new shade structures\08 specifications\06 spec\04
final\freiler\01 4523_testing and inspection services.docx
Last Updated: December 16, 2021*

TEMPORARY FACILITIES AND CONTROLS

PART 1 – GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions;
- B. Special Conditions;
- C. Site Standards; and
- D. Construction Waste Management and Disposal.

1.02 TEMPORARY UTILITIES:

- A. Electric Power and Lighting:
 - (1) Contractor will pay for power during the course of the Work. To the extent power is available in the building(s) or on the Site, Contractor may use the District's existing utilities by making prearranged payments to the District for the utilities used by Contractor and all Subcontractors. Contractor shall be responsible for providing temporary facilities required to deliver that power service from its existing location in the building(s) or on the Site to point of intended use.
 - (2) Contractor shall verify characteristics of power available in building(s) or on the Site. Contractor shall take all actions required to make modifications where power of higher voltage or different phases of current are required. Contractor shall be fully responsible for providing that service and shall pay all costs required therefor.
 - (3) Contractor shall furnish, wire for, install, and maintain temporary electrical lights wherever it is necessary to provide illumination for the proper performance and/or observation of the Work: a minimum of 20 foot-candles for rough work and 50 foot-candles for finish work.
 - (4) Contractor shall be responsible for maintaining existing lighting levels in the project vicinity should temporary outages or service interruptions occur.
- B. Water:
 - (1) Contractor shall pay for water used during the course of the Work. Contractor shall coordinate and pay for installation or use of water meter in compliance with local water agency requirements. To the

extent water is then available in the building(s) or on the Site, Contractor may use the District's existing utilities by making prearranged payments to the District for the utilities used by Contractor and all Subcontractors. Contractor shall be responsible for providing temporary facilities required to deliver such utility service from its existing location in the building(s), on the Site, or other location approved by the local water agency, to point of intended use.

- (2) Contractor shall use backflow preventers on water lines at point of connection to District's water supply. Backflow preventers shall comply with requirements of Uniform Plumbing Code.
- (3) Contractor shall make potable water available for human consumption.

C. Sanitary Facilities:

- (1) Contractor shall provide sanitary temporary facilities in no fewer numbers than required by law and such additional facilities as may be directed by the Inspector for the use of all workers. The facilities shall be maintained in a sanitary condition at all times and shall be left at the Site until removal is directed by the Inspector or Contractor completes all other work at the Site.
- (2) Use of toilet facilities in the Work under construction shall not be permitted except by consent of the Inspector and the District.

D. Fire Protection:

- (1) Contractor shall provide and maintain fire extinguishers and other equipment for fire protection. Such equipment shall be designated for use for fire protection only and shall comply with all requirements of the California Fire, State Fire Marshall and/or its designee.
- (2) Where on-site welding and burning of steel is unavoidable, Contractor shall provide protection for adjacent surfaces.

E. Trash Removal:

- (1) Contractor shall provide trash removal on a timely basis. Under no circumstance shall Contractor use District trash service.

F. Field Office:

- (1) If Contractor chooses to provide a field office, it shall be an acceptable construction trailer that is well-lit and ventilated. The construction trailer shall be equipped with shelves, desks, filing cabinet, chairs, and such other items of equipment needed. Trailer and equipment are the property of the Contractor and must be removed from the Site upon completion of the Work.
- (2) Contractor shall provide any additional electric lighting and power required for the trailer. Contractor shall make adequate provisions for heating and cooling as required.

1.03 CONSTRUCTION AIDS:

- A. Plant and Equipment:
 - (1) Contractor shall furnish, operate, and maintain a complete plant for fabricating, handling, conveying, installing, and erecting materials and equipment; and for conveyances for transporting workers. Include elevators, hoists, debris chutes, and other equipment, tools, and appliances necessary for performance of the Work.
 - (2) Contractor shall maintain plant and equipment in safe and efficient operating condition. Damages due to defective plant and equipment, and uses made thereof, shall be repaired by Contractor at no expense to the District.
- B. None of the District's tools and equipment shall be used by Contractor for the performance of the Work.

1.04 BARRIERS AND ENCLOSURES:

- A. Contractor shall obtain the District's written permission for locations and types of temporary barriers and enclosures, including fire-rated materials proposed for use, prior to their installation.
- B. Contractor shall provide and maintain temporary enclosures to prevent public entry and to protect persons using other buildings and portions of the Site and/or Premises, the public, and workers. Contractor shall also protect the Work and existing facilities from the elements, and adjacent construction and improvements, persons, and trees and plants from damage and injury from demolition and construction operations.
- C. Contractor shall provide site access to existing facilities for persons using other buildings and portions of the Site, the public, and for deliveries and other services and activities.
- D. Tree and Plant Protection:
 - (1) Contractor shall preserve and protect existing trees and plants on the Premises that are not designated or required to be removed, and those adjacent to the Premises.
 - (2) Contractor shall provide barriers to a minimum height of 4'-0" around drip line of each tree and plant, around each group of trees and plants, as applicable, in the proximity of demolition and construction operations, or as denoted on the Plans.
 - (3) Contractor shall not park trucks, store materials, perform Work or cross over landscaped areas. Contractor shall not dispose of paint thinners, water from cleaning, plastering or concrete operations, or other deleterious materials in landscaped areas, storm drain systems, or sewers. Plant materials damaged as a result of the performance of the Work shall, at the option of the District and at Contractor's expense, either be replaced with new plant materials equal in size to

those damaged or by payment of an amount representing the value of the damaged materials as determined by the District.

- (4) Contractor shall remove soil that has been contaminated during the performance of the Work by oil, solvents, and other materials which could be harmful to trees and plants, and replace with good soil, at Contractor's expense.
- (5) Excavation around Trees:
 - (a) Excavation within drip lines of trees shall be done only where absolutely necessary and with written permission from the District.
 - (b) Where trenching for utilities is required within drip lines, tunneling under and around roots shall be by hand digging and shall be approved by the District. Main lateral roots and taproots shall not be cut. All roots 2 inches in diameter and larger shall be tunneled under and heavily wrapped with wet burlap so as to prevent scarring or excessive drying. Smaller roots that interfere with installation of new work may be cut with prior approval by the District. Roots must first be cut with a Vermeer, or equivalent, root cutter prior to any trenching.
 - (c) Where excavation for new construction is required within drip line of trees, hand excavation shall be employed to minimize damage to root system. Roots shall be relocated in backfill areas wherever possible. If encountered immediately adjacent to location of new construction, roots shall be cut approximately 6 inches back from new construction.
 - (d) Approved excavations shall be carefully backfilled with the excavated materials approved for backfilling. Backfill shall conform to adjacent grades without dips, sunken areas, humps, or other surface irregularities. Do not use mechanical equipment to compact backfill. Tamp carefully using hand tools, refilling and tamping until Final Acceptance as necessary to offset settlement.
 - (e) Exposed roots shall not be allowed to dry out before permanent backfill is placed. Temporary earth cover shall be provided, or roots shall be wrapped with four layers of wet, untreated burlap and temporarily supported and protected from damage until permanently relocated and covered with backfill.
 - (f) Accidentally broken roots should be sawed cleanly 3 inches behind ragged end.

1.05 SECURITY:

The Contractor shall be responsible for project security for materials, tools, equipment, supplies, and completed and partially completed Work.

1.06 TEMPORARY CONTROLS:

A. Noise Control:

- (1) Contractor acknowledges that adjacent facilities may remain in operation during all or a portion of the Work period, and it shall take all reasonable precautions to minimize noise as required by applicable laws and the Contract Documents.
- (2) Notice of proposed noisy operations, including without limitation, operation of pneumatic demolition tools, concrete saws, and other equipment, shall be submitted to the District a minimum of forty-eight (48) hours in advance of their performance.

B. Noise and Vibration:

- (1) Equipment and impact tools shall have intake and exhaust mufflers.
- (2) Contractor shall cooperate with District to minimize and/or cease the use of noisy and vibratory equipment if that equipment becomes objectionable by its longevity.

C. Dust and Dirt:

- (1) Contractor shall conduct demolition and construction operations to minimize the generation of dust and dirt, and prevent dust and dirt from interfering with the progress of the Work and from accumulating in the Work and adjacent areas including, without limitation, occupied facilities.
- (2) Contractor shall periodically water exterior demolition and construction areas to minimize the generation of dust and dirt.
- (3) Contractor shall ensure that all hauling equipment and trucks carrying loads of soil and debris shall have their loads sprayed with water or covered with tarpaulins, and as otherwise required by local and state ordinance.
- (4) Contractor shall prevent dust and dirt from accumulating on walks, roadways, parking areas, and planting, and from washing into sewer and storm drain lines.

D. Water:

- (1) Contractor shall not permit surface and subsurface water, and other liquids, to accumulate in or about the vicinity of the Premises. Should accumulation develop, Contractor shall control the water or other liquid, and suitably dispose of it by means of temporary pumps, piping, drainage lines, troughs, ditches, dams, or other methods.

E. Pollution:

- (1) No burning of refuse, debris, or other materials shall be permitted on or in the vicinity of the Premises.
- (2) Contractor shall comply with applicable regulatory requirements and anti-pollution ordinances during the conduct of the Work including, without limitation, demolition, construction, and disposal operations.

F. Lighting:

- (1) If portable lights are used after dark, all light must be located so as not to direct light into neighboring property.

1.07 PUBLICITY RELEASES:

- A. Contractor shall not release any information, story, photograph, plan, or drawing relating information about the Project to anyone, including press and other public communications medium, including, without limitation, on website(s) without the written permission of the District.

PART 2 – PRODUCTS Not used.

PART 3 – EXECUTION Not used.

END OF DOCUMENT

CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions;
- B. Special Conditions; and
- C. Temporary Facilities and Controls.

1.02 SECTION INCLUDES:

- A. Administrative and procedural requirements for the following:
 - (1) Salvaging non-hazardous construction waste.
 - (2) Recycling non-hazardous construction waste.
 - (3) Disposing of non-hazardous construction waste.

1.03 DEFINITIONS:

- A. Construction Waste: Building and site improvement materials and other solid waste resulting from construction, remodeling, renovation, or repair operations. Construction waste includes packaging.
- B. Demolition Waste: Building and site improvement materials resulting from demolition or selective demolition operations.
- C. Disposal: Removal off-site of demolition and construction waste and subsequent sale, recycling, reuse, or deposit in landfill or incinerator acceptable to authorities having jurisdiction.
- D. Recycle: Recovery of demolition or construction waste for subsequent processing in preparation for reuse.
- E. Salvage: Recovery of demolition or construction waste and subsequent sale or reuse in another facility.
- F. Salvage and Reuse: Recovery of demolition or construction waste and subsequent incorporation into the Work.

1.04 PERFORMANCE REQUIREMENTS:

- A. General: Develop waste management plan that results in end-of Project rates for salvage/recycling of sixty-five percent (65%) by weight (or by volume, but not a combination) of total waste generated by the Work.

1.05 SUBMITTALS:

- A. Waste Management Plan: Submit waste management plan within 30 days of date established for commencement of the Work.
- B. Waste Reduction Progress Reports: Concurrent with each Application for Payment, submit copies of report. Include the following information:
 - (1) Material category.
 - (2) Generation point of waste.
 - (3) Total quantity of waste in tons or cubic yards.
 - (4) Quantity of waste salvaged, both estimated and actual in tons or cubic yards.
 - (5) Quantity of waste recycled, both estimated and actual in tons or cubic yards.
 - (6) Total quantity of waste recovered (salvaged plus recycled) in tons or cubic yards.
 - (7) Total quantity of waste recovered (salvaged plus recycled) as a percentage of total waste.
- C. Waste Reduction Calculations: Before request for final payment, submit copies of calculated end-of-Project rates for salvage, recycling, and disposal as a percentage of total waste generated by the Work.
- D. Records of Donations: Indicate receipt and acceptance of salvageable waste donated to individuals and organizations. Indicate whether organization is tax exempt.
- E. Records of Sales: Indicate receipt and acceptance of salvageable waste sold to individuals and organizations. Indicate whether organization is tax exempt.
- F. Recycling and Processing Facility Records: Indicate receipt and acceptance of recyclable waste by recycling and processing facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.
- G. Landfill and Incinerator Disposal Records: Indicate receipt and acceptance of waste by landfills and incinerator facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.

- H. Qualification Data: For Waste Management Coordinator.
- I. Submittal procedures and quantities are specified in Document 01 33 00.

1.06 QUALITY ASSURANCE:

- A. Waste Management Coordinator Qualifications: LEED Accredited Professional by U.S. Green Building Council.
- B. Regulatory Requirements: Comply with hauling and disposal regulations of authorities having jurisdiction.
- C. Waste Management Conference: Conduct conference at Project site to comply with requirements. Review methods and procedures related to waste management including, but not limited to, the following:
 - (1) Review and discuss waste management plan including responsibilities of Waste Management Coordinator.
 - (2) Review requirements for documenting quantities of each type of waste and its disposition.
 - (3) Review and finalize procedures for materials separation and verify availability of containers and bins needed to avoid delays.
 - (4) Review procedures for periodic waste collection and transportation to recycling and disposal facilities.
 - (5) Review waste management requirements for each trade.

1.07 WASTE MANAGEMENT PLAN:

- A. General: Develop plan consisting of waste identification, waste reduction work plan, and cost/revenue analysis. Indicate quantities by weight or volume, but use same units of measurement throughout waste management plan.
- B. Waste Identification: Indicate anticipated types and quantities of site-clearing and construction waste generated by the Work. Include estimated quantities and assumptions for estimates.
- C. Waste Reduction Work Plan: List each type of waste and whether it will be salvaged, recycled, or disposed of in landfill or incinerator. Include points of waste generation, total quantity of each type of waste, quantity for each means of recovery, and handling and transportation procedures.
 - (1) Salvaged Materials for Reuse: For materials that will be salvaged and reused in this Project, describe methods for preparing salvaged materials before incorporation into the Work.

- (2) Salvaged Materials for Sale: For materials that will be sold to individuals and organizations, include list of their names, addresses, and telephone numbers.
- (3) Salvaged Materials for Donation: For materials that will be donated to individuals and organizations, include list of their names, addresses, and telephone numbers.
- (4) Recycled Materials: Include list of local receivers and processors and type of recycled materials each will accept. Include names, addresses, and telephone numbers.
- (5) Disposed Materials: Indicate how and where materials will be disposed of. Include name, address, and telephone number of each landfill and incinerator facility.
- (6) Handling and Transportation Procedures: Include method that will be used for separating recyclable waste including sizes of containers, container labeling, and designated location on Project site where materials separation will be located.

PART 2 - PRODUCTS Not Used.

PART 3 - EXECUTION

3.01 PLAN IMPLEMENTATION:

- A. General: Implement approved waste management plan. Provide handling, containers, storage, signage, transportation, and other items as required to implement waste management plan during the entire duration of the Contract.
 - (1) Comply with Document 01 50 00 for operation, termination, and removal requirements.
- B. Training: Train workers, subcontractors, and suppliers on proper waste management procedures, as appropriate for the Work occurring at Project site.
 - (1) Distribute waste management plan to everyone concerned within 3 days of submittal return.
 - (2) Distribute waste management plan to entities when they first begin work on site. Review plan procedures and locations established for salvage, recycling, and disposal.
- C. Site Access and Temporary Controls: Conduct waste management operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.

- (1) Designate and label specific areas of Project site necessary for separating materials that are to be salvaged, recycled, reused, donated, and sold.
- (2) Comply with Document 01 50 00 for controlling dust and dirt, environmental protection, and noise control.

3.02 RECYCLING CONSTRUCTION WASTE:

- A. General: Recycle paper and beverage containers used by on-site workers.
- B. Recycling Incentives: Revenues, savings, rebates, tax credits, and other incentives received for recycling waste materials shall accrue to the Contractor.
- C. Procedures: Separate recyclable waste from other waste materials, trash, and debris. Separate recyclable waste by type at Project site to the maximum extent practical.
 - (1) Provide appropriately marked containers or bins for controlling recyclable waste until they are removed from Project Site. Include list of acceptable and unacceptable materials at each container and bin.
 - (a) Inspect containers and bins for contamination and remove contaminated materials if found.
 - (2) Stockpile processed materials on site without intermixing with other materials. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
 - (3) Stockpile materials away from construction area. Do not store within drip line of remaining trees.
 - (4) Store components off the ground and protect from the weather.
 - (5) Remove recyclable waste off District property and transport to recycling receiver or processor.
- D. Packaging:
 - (1) Cardboard and Boxes: Break down packaging into flat sheets. Bundle and store in a dry location.
 - (2) Polystyrene Packaging: Separate and bag material.
 - (3) Pallets: As much as possible, require deliveries using pallets to remove pallets from Project Site. For pallets that remain on Site, break down pallets into component wood pieces and comply with requirements for recycling wood.
 - (4) Crates: Break down crates into component wood pieces and comply with requirements for recycling wood.

- E. Site-Clearing Wastes: Chip brush, branches, and trees on site.
- F. Wood Materials:
 - (1) Clean Cut-Offs of Lumber: Grind or chip into small pieces.
 - (2) Clean Sawdust: Bag sawdust that does not contain painted or treated wood.

3.03 DISPOSAL OF WASTE:

- A. General: Except for items or materials to be salvaged, recycled, or otherwise reused, remove waste materials from Project Site and legally dispose of them in a landfill or incinerator acceptable to authorities having jurisdiction.
 - (1) Except as otherwise specified, do not allow waste materials that are to be disposed of accumulate on site.
 - (2) Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
- B. Burning: Do not burn waste materials.
- C. Disposal: Transport waste materials off District property and legally dispose of them.

END OF DOCUMENT

FIELD OFFICES

PART 1 – GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions;
- B. Special Conditions; and
- C. Temporary Facilities and Controls.

1.02 SECTION INCLUDES:

- A. Requirements for Field Offices and Field Office Trailers.

1.03 SUMMARY:

- A. General: Contractor shall provide District's Field Office Trailer and contents, for District's use exclusively, during the term of the Contract.
- B. Property: Trailer, furniture, furnishings, equipment, and the like, supplied by the Contractor with the Office Trailer shall remain the property of the Contractor; District property items installed, delivered, and the like by District within the Office Trailer will remain District's property.
- C. Modifications: District reserves the right to modify the trailer or contents, or both, as may be deemed proper by District.
- D. Condition: Trailer and contents shall be clean, neat, substantially finished, in good, proper, and safe condition for use, operation, and the like; the trailer and contents shall not be required to be new.
- E. Installation Timing: Provide safe, fully furnished, functional, proper, complete, and finished trailer properly ready for entire use, within fourteen (14) calendar days of District's notification of the issuance of Notice to Proceed.

1.04 SUBMITTALS:

- A. General: Submit submittals to District in quantity, format, type, and the like, as specified herein.
- B. Office Trailer Data: One (1) copy of manufacturer's descriptive data, technical descriptions, regulatory compliance, industry standards, installation, removal, and maintenance instructions.

- C. Equipment Data: Two (2) copies of manufacturer data for each type of equipment, if directed by District.
- D. Furniture and Furnishings Data: Two (2) copies of manufacturer data for each type of equipment, if directed by District.
- E. Plans: One (1) reproducible copy of appropriately scaled plans of trailer layout. Plans shall include, but not be limited to: lighting; furniture; equipment; telephone and electrical outlets; and the like.
- F. Product Samples: One (1) complete and entire unit of each type, if directed by District.

1.05 QUALITY ASSURANCE

- A. Standards: In the event that provisions of codes, regulations, safety orders, Contract Documents, referenced manufacturer's specifications, manufacturer's instructions, industry standards, and the like, are in conflict, the more restrictive and higher quality shall govern.
- B. Installer: Installer or Installers engaged by Contractor must have a minimum of five (5) years of documented and properly authenticated successful experience of specialization in the installation of the items or systems, or both, specified herein.
- C. Manufacturer: Contractor shall obtain products from nationally and industry recognized Manufacturer with five (5) years minimum, of immediately recent, continuous, documented and properly authenticated successful experience of specialization in the manufacture of the product specified herein.
- D. State Personnel Training: Provide proper training for maintenance and operations, including emergency procedures, and the like, as directed by District.
- E. Units: Shall be sound and free of defects, and shall not include any damage or defect that will impair the safety, installation, performance, or the durability of the entire Office Trailer and appurtenant systems.

1.06 REGULATORY REQUIREMENTS

- A. General: Work shall be executed in accordance with applicable Codes, Regulations, Statutes, Enactments, Rulings, Laws, each authority having jurisdiction, and including, but not limited to, Regulatory Requirements specified herein.
- B. California Building Standards Code ("CBSC").
- C. California Code of Regulations, Title 25, Chapter 3, Sub Chapter 2, Article 3 ("CCR").
- D. Coach Insignia: Trailer shall display California Commercial Coach Insignia; such insignia shall be deemed to show that the trailer is in accordance with the Construction and Fire Safety requirements of CCR.

PART 2 – PRODUCTS

2.01 FIELD OFFICE TRAILER

- A. General: Provide entire Field Office Trailer of type, function, operation, capacity, size, complete with controls, safety devices, accessories, and the like, for proper and durable installation. Partitions, walls, ceiling, and other interior and exterior surfaces shall be appropriately finished, including, but not limited to, trim, painting, wall base, floor covering, suspended or similar ceiling, and the like; provide systems, components, units, nuts, bolts, screws, anchoring devices, fastening devices, washers, accessories, adhesives, sealants, and other items of type, grade, and class required for the particular use, not identified but required for a complete, weather-tight, appropriately operating, and finished installation.
- B. Manufacturers: General Electric Capital Modular Space; The Space Place, Inc.; or equal.
- C. Program: Provide a wheel-mounted trailer with stairs, landings, platforms, ramps, and the like, in good, proper, safe, clean, and properly finished condition; with proper heavy duty locks, and other proper and effective security at all doors, windows, and the like. Trailer shall be maintained in good, proper, safe, clean, and properly finished condition during the Contract.
 - (1) Nominal Trailer Size: Four hundred eighty (480) square feet, minimum.
 - (2) Stairs, Platform: Properly finished stairs, platforms, and ramps.
 - (3) Doors: Two (2), three (3) foot wide exterior doors with locksets; finished ramp, steps, and entry platform at each exterior door.
 - (4) Keys: Submit five (5) keys for each door, window, furniture unit, and the like. There shall be no other key copies or originals available; each key shall be identified for District; and shall be labeled, or tagged
 - (5) Lighting: Sixty-five (65) foot-candles illumination minimum at any point, at thirty (30) inches above finished floor throughout from fluorescent light source, exclusively, or as directed by District.
 - (6) Electrical Outlets: One (1) duplex outlet evenly spaced every twelve (12) linear horizontal feet of wall face, and electrical service ready for use.

2.02 FIELD OFFICE TRAILER ITEMS

- A. General: Provide the Field Office Trailer with the following arranged into two (2) workstations:
 - (1) Desks: Two (2) desks: thirty-six (36) inches by sixty (60) inches; steel, laminated plastic top; locking, one (1) or two (2) file drawers single pedestal; steel; provide five (5) keys to District.

- (2) Tables: Two (2) tables; thirty-six (36) inches by sixty (60) inches; twenty-nine (29) inches high; steel, laminated plastic top tables; one (1) at each desk.
 - (3) Chairs: Two (2) chairs: swivel; steel; with seat cushion and arms; one (1) at each desk.
 - (4) Waste Baskets: Two (2) waste baskets, one at each desk.
- B. Furniture and Equipment: Provide in the space located to effect efficient and logical use.
- (1) File cabinet: One (1); four (4) drawer; lateral; steel locking.
 - (2) Plan Table: One (1) plan table: thirty-six (36) inches deep by seventy-two (72) inches wide by forty-two (42) inches high; adjustable; wood or steel; with lockable plan and pencil drawers.
 - (3) Drafting Stool: One (1) drafting stool; swiveling; steel; padded; adjustable; with footrest and casters.
 - (4) Bookshelf: One (1) bookshelf: thirty-six (36) inches deep by seventy-two (72) inches wide by forty-two (42) inches high; adjustable; wood or steel; with lockable plan and pencil drawer.
 - (5) Plan Rack: One (1) wheel mounted plan rack.
 - (6) Waste Baskets: One (1) large waste basket.
 - (7) Coat/Hat Hanger: Wall mounted with minimum capacity for four (4) garments and ten (10) hats.
 - (8) Document Management System: Shall include an integrated high-volume printer, copier, and facsimile machine, including stand, base, and storage cabinet; and shall include the following features:
 - (a) Type: Laser, dry electrostatic transfer, plain paper, digital, multi-function imaging system.
 - (b) Network: Ethernet or Token Ring network ready, Plug-and-Play.
 - (c) Print, send/receive facsimile from any connected workstation.
 - (d) Resolution: Six hundred (600) dots per inch by six hundred (600) dots per inch, minimum.
 - (e) Print Speed: Twenty (20) pages per minute, minimum.
 - (f) Copies: Twenty (20) copies per minute, minimum.
 - (g) Document Handler: Forty (40) sheet, minimum

- (h) Collator: Forty (40) bin, minimum, with stapling.
- (i) Duplexing: Capable.
- (j) Paper Size: Capable of handling paper sizes to eleven (11) inches by seventeen (17) inches.
- (k) Paper Cassettes: One (1) each for eight and one half (8.5) inches by eleven (11) inches, eight and one half (8.5) inches by fourteen (14) inches, and eleven (11) inches by seventeen (17) inches paper sizes; minimum two hundred fifty (250) sheets per cassette.
- (l) Reduction/Enlargement: Capable of reduction to twenty-five percent (25%) and enlargement to two hundred percent (200%).
- (m) Facsimile Electronic Storage: Capable of storing minimum of fifty (50) speed dial numbers, group faxing and broadcast faxing.
- (n) Facsimile Scanning: Capable of scanning into memory a minimum of one hundred (100) pages with maximum scan time of three (3) seconds per page.
- (o) Halftone: Sixty-four (64) levels.
- (p) Redial: Automatic and Manual.
- (9) Maintenance: Contractor shall purchase service agreements for each unit of equipment for the duration of the project plus two (2) months, and shall maintain all equipment in proper working condition. Service agreements shall include provision for replacement of toner cartridges and other items required to effect proper unit use. Service agreements shall also provide for:
 - (a) Unlimited Service Calls.
 - (b) Same Day Response.
 - (c) All parts, labor, preventative maintenance and mileage.
 - (d) All chemicals, such as toner, fixing agent, and the like.
 - (e) System training and setup.
- (10) Portable Toilets: Two (2); each shall include a urinal; each unit shall be a properly enclosed chemical unit conforming to ANSI Z4.3.
 - (a) Location: As directed by District.
 - (b) Maintenance: Maintain each unit and surrounding areas in a clean, hygienic and orderly manner, at all time. Empty, clean,

and sanitize each unit each day at a location and time as directed by District.

- (c) Removal: Relocate, or remove from the site, each Portable Toilet. Upon such directive by District, the Contractor shall forthwith relocate or remove each Portable Toilet and submit the affected areas to a condition which existed prior to the installation of each Portable Toilet, within three (3) calendar days, or as directed by District in writing, at no cost to District.

2.03 UTILITY AND SERVICES

- A. Telephone Service: Contractor shall provide and interface the entire telephone service, and shall properly and timely pay for telephone service for District's non-long-distance use.
- B. Electrical Service: Provide all proper connections and continuously pay for service for the duration of the Work.

2.04 FINISHES

- A. General: Manufacturer standard finish system over surfaces properly cleaned, pretreated, and prepared to obtain proper bond; all visible surfaces shall be coated.
- B. Finish: Color as selected by District from manufacturer standard palette.

PART 3 – EXECUTION

3.01 INSTALLATION

- A. General: Properly prepare area and affected items to receive the Work. Set Work accurately in location, alignment, and elevation; rigidly, securely, and firmly anchor to appropriate structure; install plumb, straight, square, level, true, without racking, rigidly anchored to proper solid blocking, substrate, and the like; provide appropriate type and quantity of reinforcements, fasteners, adhesives, self-adhesive and other tapes; lubricants, coatings, accessories, and the like, as required for a complete, structurally rigid, stable, sound, and appropriately finished installation, in accordance with manufacturer's published instructions, and as indicated. The more restrictive and higher quality requirement shall govern. Moving parts shall be properly secured, without binding, looseness, noise, and the like.
- B. Installation: Install in accordance with 25 CCR 3.2.3 and as directed by District; jack up trailer and level both ways; mount on proper concrete piers with all load off wheels; provide required tie down and accessories per Section 4368 of referenced CCR, and as directed by District.
- C. Rejected Work: Work, materials, unit, items, systems, and the like, not accepted by District shall be deemed rejected, and shall forthwith be removed and replaced with proper and new Work, materials, unit, items, systems, and the like at no cost to District.

- D. Standard: Comply with manufacturer's published instructions, or with instructions as shown or indicated; the more restrictive and higher quality requirement shall govern.
- E. Location: As directed by District.
- F. Fire Resistance: Construct and install in accordance with UL requirements.
- G. Maintenance: Contractor shall maintain trailer and adjacent areas in a safe, clean and hygienic condition throughout the duration of the Work, and as directed by District. Properly repair or replace furniture or other items, as directed by District. Properly remove unsafe, damaged, or broken furniture, or similar items, and replace with safe and proper items. Contractor shall pay cost of all services, repair, and maintenance, or replacement of each item.
- H. Janitorial Service: Provide professional janitorial services, including, but not limited to, trash, waste paper baskets, fill paper dispensers; clean and dust all furniture, files, and the like; sweep and mop resilient and similar flooring; and vacuum carpeting and similar flooring.
 - (1) Frequency: Two (2) times per week, minimum.
- I. Removal: Properly remove the Office Trailer and contents from the Site upon completion of the Contract, or as directed by District in writing. Forthwith properly patch and repair affected areas; replace damaged items with new items. Carefully and properly inventory, clean, pack, store, and protect District property; submit District property to District at a date, time and location as directed by District.

END OF DOCUMENT

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: VOC restrictions for product categories listed below under Article "DEFINITIONS" and in compliance with the following.
 - 1. California Code of Regulations, Title 24, Part 11 California Green Building Standards Code.
 - 2. Local Agency.
 - 3. No Rating System is applicable.
- B. Products of each category that are installed in the project must comply; applicable laws and ordinances do not allow for partial compliance.
- C. Listing of a product in these Specifications shall not be construed as a solicitation or requirement to use any product or combination of products in violation of the requirements of South Coast Air Quality Management District Rule No.1168, as described in Rule 1168(g).
 - 1. If a listed product does not meet the requirements of this rule, request approval for use of an alternate product by the same or another manufacturer meeting the requirements of this rule.
 - 2. Do not use products which do not meet the requirements of this rule.

1.2 RELATED REQUIREMENTS

- A. Divisions 01 through 33 contain related requirements specific to the work of each of these Sections. Requirements may or may not include reference to this Section.
- B. Section 01 8113, Sustainable Design Requirements, for CAL-Green general requirements and procedures.

1.3 REFERENCES

- A. California Green Building Standards Code (CALGreen), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. Low-Emitting Materials Product List; California Collaborative for High Performance Schools (CHPS); current edition at www.chps.net/.
- C. CRI (GLCC) - Green Label Testing Program - Approved Product Categories for Carpet Cushion; Carpet and Rug Institute; current edition.
- D. CRI (GLP) - Green Label Plus Carpet Testing Program - Approved Products; Carpet and Rug Institute; current edition.
- E. GEI (SCH) - GREENGUARD "Children and Schools" Certified Products; GREENGUARD Environmental Institute; current listings at www.greenguard.org.

VOLATILE ORGANIC COMPOUND (VOC) RESTRICTIONS

SECTION 01 6116

3595001

- F. GreenSeal GS-36 - Commercial Adhesives; Green Seal, Inc.
- G. SCAQMD 1168 - South Coast Air Quality Management District Rule No.1168; current edition; www.aqmd.gov.
- H. SCS (CPD) - SCS Certified Products; Scientific Certification Systems; current listings at www.scs-certified.com.

1.4 DEFINITIONS

- A. VOC-Restricted Products: Products of each of the following categories when installed or applied on-site:
 - 1. Adhesives, sealants, and sealer coatings, regardless of specification Section or Division.
 - 2. Paints and coatings.
 - 3. Carpet and resilient flooring.
 - 4. Composite wood products; plywood, particleboard, wood fiberboard.
- B. Adhesives: Gunnable, trowelable, liquid-applied, and aerosol adhesives, whether specified or not; including flooring adhesives, resilient base adhesives, and pipe jointing adhesives.
- C. Sealants: Gunnable, trowelable, and liquid-applied joint sealants and sealant primers, whether specified or not; including firestopping sealants and duct joint sealers.

1.5 SUBMITTAL REQUIREMENTS

- A. Product Data: For each VOC-restricted product used in the project, submit product data showing compliance, except when another type of evidence of compliance is required.
- B. Verification of Compliance: Submit for each different product in each applicable category.
 - 1. Identify evidence submittals with the words "CALGreen VOC Compliance Report".
- C. Installer Certifications for Accessory Materials:
 - 1. Require each installer of any type of product, not just the products for which VOC restrictions are specified, to certify that either 1) no adhesives, joint sealants, paints, coatings, or composite wood or agrifiber products have been used in the installation of their products, or 2) that such products used comply with these requirements.
 - 2. Use the form following at the end of Part 3 in this Section for Installer certifications.

1.6 QUALITY ASSURANCE

- A. Manufacturer's Testing Agency Qualifications: Independent firm specializing in performing testing and inspections of the type specified in this Section.

VOLATILE ORGANIC COMPOUND (VOC) RESTRICTIONS
SECTION 01 6116
3595001

PART 2 - PRODUCTS

2.1 MATERIALS

A. General:

1. Provide products conforming to local, State and Federal government requirements limiting the amount of volatile organic compounds contained in the product, for its intended application. If specified product exceeds current requirement, provide conforming product at no additional cost.
2. Provide only products having volatile organic compound (VOC) content not greater than required by South Coast Air Quality Management District Rule No.1168 and less where required by code.
3. Products are specified in multiple Sections throughout these Specifications.

B. Composite Wood Products: Comply with CALGreen Section 5.504 and Table 5.504.4.5 formaldehyde limits for hardwood plywood, particleboard, and medium density fiberboard composite wood products used on the interior and exterior of the building.

1. Verification of Compliance: Acceptable types are:
 - a. Certification by manufacturer that product complies with requirements.
 - b. Published product data showing compliance with requirements.
 - c. Chain of custody certifications.
 - d. Product labeled and invoiced as meeting the Composite Wood Products regulation (CCR, Title 17, Section 93120, et seq.).
 - e. Products marked as meeting the PS-1 or PS-2 standards of the Engineered Wood Association, the Australian AS/NZS 2269, or European 636 3S standards.
 - f. Other method acceptable to enforcing agency.

Table 5.504.4.5 FORMALDEHYDE LIMITS	
Maximum Formaldehyde Emissions in Parts per Million	
Product	Current Limit
Hardwood plywood veneer core	0.05
Hardwood plywood composite core	0.05
Particleboard	0.09
Medium density fiberboard	0.11
Thin medium density fiberboard ¹	0.13
Note 1: Thin medium density fiberboard has a maximum thickness of 5/16 inch (8 mm).	

C. Joint Sealants: Comply with CALGreen Section 5.504 and Table 5.504.4.2.

1. Verification of Compliance: Acceptable types are:
 - a. Report of laboratory testing performed in accordance with requirements.
 - b. Published product data showing compliance with requirements.

VOLATILE ORGANIC COMPOUND (VOC) RESTRICTIONS
SECTION 01 6116
3595001

- c. Certification by manufacturer that product complies with requirements.
- 2. Products used shall comply with the following limits.

Table 5.504.4.2 SEALANT VOC LIMIT	
Less Water and Less Exempt Compounds in Grams per Liter	
Sealant	Current VOC Limit
Architectural	250
Marine Deck	760
Non-Membrane Roof	300
Roadway	250
Single-Ply Roof Membrane	450
Other	420
Sealant Primers	Current VOC Limit
Architectural	250
Non-Porous	
Porous	775
Modified Bituminous	500
Marine Deck	760
Other	750
For low-solid adhesives or sealants the VOC limit is expressed in grams per liter of material; for all other adhesives and sealants, VOC limits are expressed as grams of VOC per liter of adhesive or sealant less water and less exempt compounds.	

- D. Paints and Coatings: Comply with CALGreen Section 5.504 and Table 5.504.4.3 based on the California Air Resources Board, Architectural Coatings Suggested Control Measure.
 - 1. Determination of VOC Content: Testing and calculation in accordance with 40 CFR 59, Subpart D (EPA Method 24), exclusive of colorants added to a tint base and water added at Project site; or other method acceptable to authorities having jurisdiction.
 - a. Verification of Compliance: Acceptable types are:
 - 1) Report of laboratory testing performed in accordance with requirements.
 - 2) Published product data showing compliance with requirements.
 - 3) Certification by manufacturer that product complies with requirements.
 - 2. Provide coatings that comply with the most stringent requirements specified in the following:
 - a. 40 CFR 59, Subpart D--National Volatile Organic Compound Emission Standards for Architectural Coatings.
 - b. South Coast Air Quality Management District Rule No.1168.
 - 3. Products used shall comply with the following limits.

VOLATILE ORGANIC COMPOUND (VOC) RESTRICTIONS
SECTION 01 6116
3595001

Table 5.504.4.3 VOC CONTENT LIMITS FOR ARCHITECTURAL COATINGS (See Notes 2 & 3 below)	
Grams of VOC per Liter of Coating, less water and less exempt compounds	
Coating Category	Current VOC Limit 1/1/2012
Flat Coatings	50
Non-Flat Coatings	100
Non-Flat High Gloss Coatings	150
Specialty Coatings	
Aluminum Roof Coatings	400
Basement Specialty Coatings	400
Bituminous Roof Coatings	50
Bituminous Roof Primers	350
Bond Breakers	350
Concrete Curing Compounds	350
Concrete / Masonry Sealers	100
Driveway Sealers	50
Dry Fog Coatings	150
Faux Finishing Coatings	350
Fire Resistive Coatings	350
Floor Coatings	100
Form-Release Compounds	250
Graphic Arts Coatings (Sign Paints)	500
High-Temperature Coatings	420
Industrial Maintenance Coatings	250
Low Solids Coatings (See Note 1 below)	120
Magnesite Cement Coatings	450
Mastic Texture Coatings	100
Metallic Pigmented Coatings	500
Multicolor Coatings	250
Pretreatment Wash Primers	420
Primers, Sealers and Undercoaters	100
Reactive Penetrating Sealers	350
Recycled Coatings	250
Roof Coatings	50
Rust Preventative Coatings	250
Shellacs:	
Clear	730
Opaque	550
Specialty Primers, Sealers and Undercoaters	100
Stains	250
Stone Consolidants	450
Swimming Pool Coatings	340
Traffic Marking Coatings	100
Waterproofing Membranes	250
Wood Coatings	275

VOLATILE ORGANIC COMPOUND (VOC) RESTRICTIONS
SECTION 01 6116
3595001

Table 5.504.4.3 VOC CONTENT LIMITS FOR ARCHITECTURAL COATINGS (See Notes 2 & 3 below)	
Grams of VOC per Liter of Coating, less water and less exempt compounds	
Coating Category	Current VOC Limit 1/1/2012
Wood Preservatives	350
Zinc Rich Primers	340
Note 1: Grams of VOC per liter of coating including water and including exempt compounds	
Note 2: Not Applicable	
Note 3: Values in this table are derived from those specified by the California Air Resources Board, Architectural Coatings Suggested Control Measure, February 1, 2008. More information is available from the Air Resources Board.	

4. Restricted Components: In addition to the specified VOC limits, paints and coatings shall not contain any of the following:
- Acrolein.
 - Acrylonitrile.
 - Antimony.
 - Benzene.
 - Butyl benzyl phthalate.
 - Cadmium.
 - Di (2-ethylhexyl) phthalate.
 - Di-n-butyl phthalate.
 - Di-n-octyl phthalate.
 - 1,2-dichlorobenzene.
 - Diethyl phthalate.
 - Dimethyl phthalate.
 - Ethylbenzene.
 - Formaldehyde.
 - Hexavalent chromium.
 - Isophorone.
 - Lead.
 - Mercury.
 - Methyl ethyl ketone.
 - Methyl isobutyl ketone.
 - Methylene chloride.
 - Naphthalene.
 - Toluene (methylbenzene).
 - 1,1,1-trichloroethane.

- y. Vinyl chloride.

PART 3 - EXECUTION

3.1 FIELD QUALITY CONTROL

- A. Owner reserves the right to reject non-compliant products, whether installed or not, and require their removal and replacement with compliant products at no extra cost to Owner.
- B. Additional costs to restore indoor air quality, including fines by authorities, due to installation of non-compliant products shall be borne by Contractor.

3.2 CERTIFICATION FORM

- A. Use of this Form:
 - 1. Because installers are allowed and directed to choose accessory materials suitable for the applicable installation, there is a possibility that such accessory materials might contain VOC content in excess of that permitted, especially where such materials have not been explicitly specified.
 - 2. Contractor is required to obtain and submit this Form from each installer of work on this project.
 - 3. For each product category listed, circle the correct words in brackets: either [HAS] or [HAS NOT].
 - 4. If these accessory materials have been used, attach to this form product data and MSDS sheet for each such product.

(The Remainder of this Page is Intentionally Left Blank)

VOLATILE ORGANIC COMPOUND (VOC) RESTRICTIONS
SECTION 01 6116
3595001

ACCESSORY MATERIAL VOC CONTENT CERTIFICATION FORM

IDENTIFICATION:

Project Name: _____

Project No.: _____

Architect: _____

PRODUCT CERTIFICATION: I certify that the installation work of my firm on this project:

1. [HAS] [HAS NOT] required the use of any ADHESIVES.
2. [HAS] [HAS NOT] required the use of any JOINT SEALANTS.
3. [HAS] [HAS NOT] required the use of any PAINTS OR COATINGS.
4. [HAS] [HAS NOT] required the use of any COMPOSITE WOOD or AGRIFIBER PRODUCTS.

Product data and MSDS sheets are attached.

CERTIFIED BY (Installer/Manufacturer/Supplier Firm):

Firm Name: _____

Print Name: _____

Signature: _____

Title: _____ (officer of company)

Date: _____

END OF SECTION

*p:\sacramento\3595 tracy unified school district\001-000_villalovoz es new shade structures\08 specifications\06 spec\04
final\freiler\01 6116_volatile organic compound (voc) restrictions.docx
Last Updated: January 18, 2022*

SECTION 01 66 00

PRODUCT DELIVERY, STORAGE AND HANDLING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Site Access, Conditions and Requirements;
- B. Special Conditions.

1.02 PRODUCTS

- A. Products are as defined in the General Conditions.
- B. Contractor shall not use and/or reuse materials and/or equipment removed from existing Premises, except as specifically permitted by the Contract Documents.
- C. Contractor shall provide interchangeable components of the same manufacturer, for similar components.

1.03 TRANSPORTATION AND HANDLING

- A. Contractor shall transport and handle Products in accordance with manufacturer's instructions.
- B. Contractor shall promptly inspect shipments to confirm that Products comply with requirements, quantities are correct, and products are undamaged.
- C. Contractor shall provide equipment and personnel to handle Products by methods to prevent soiling, disfigurement, or damage.

1.04 STORAGE AND PROTECTION

- A. Contractor shall store and protect Products in accordance with manufacturer's instructions, with seals and labels intact and legible. Contractor shall store sensitive products in weather-tight, climate controlled enclosures.
- B. For exterior storage of fabricated Products, Contractor shall place on sloped supports, above ground.
- C. Contractor shall provide off-site storage and protection when Site does not permit on-site storage or protection.

- D. Contractor shall cover products subject to deterioration with impervious sheet covering and provide ventilation to avoid condensation.
- E. Contractor shall store loose granular materials on solid flat surfaces in a well-drained area and prevent mixing with foreign matter.
- F. Contractor shall provide equipment and personnel to store Products by methods to prevent soiling, disfigurement, or damage.
- G. Contractor shall arrange storage of Products to permit access for inspection and periodically inspect to assure Products are undamaged and are maintained under specified conditions.

PART 2 – PRODUCTS Not Used.

PART 3 - EXECUTION Not Used.

END OF DOCUMENT

CUTTING AND PATCHING

PART 1 – GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Inspector, Inspections, and Tests, Integration of Work, Nonconforming Work, and Correction of Work, and Uncovering Work;
- B. Special Conditions;
- C. Imported Materials Certification.

1.02 CUTTING AND PATCHING:

- A. Contractor shall be responsible for all cutting, fitting, and patching, including associated excavation and backfill, required to complete the Work or to:
 - (1) Make several parts fit together properly.
 - (2) Uncover portions of Work to provide for installation of ill-timed Work.
 - (3) Remove and replace defective Work.
 - (4) Remove and replace Work not conforming to requirements of Contract Documents.
 - (5) Remove Samples of installed Work as specified for testing.
 - (6) Provide routine penetrations of non-structural surfaces for installation of piping and electrical conduit.
 - (7) Attaching new materials to existing remodeling areas – including painting (or other finishes) to match existing conditions.
- B. In addition to Contract requirements, upon written instructions from the District, Contractor shall uncover Work to provide for observations of covered Work in accordance with the Contract Documents; remove samples of installed materials for testing as directed by District; and remove Work to provide for alteration of existing Work.
- C. Contractor shall not cut or alter Work, or any part of it, in such a way that endangers or compromises the integrity of the Work, the Project, or work of others.

1.03 SUBMITTALS:

- A. Prior to any cutting or alterations that may affect the structural safety of Project, or work of others, and well in advance of executing such cutting or alterations, Contractor shall submit written notice to District pursuant to the applicable notice provisions of the Contract Documents, requesting consent to proceed with the cutting or alteration, including the following:
 - (1) The work of the District or other trades.
 - (2) Structural value or integrity of any element of Project.
 - (3) Integrity or effectiveness of weather-exposed or weather-resistant elements or systems.
 - (4) Efficiency, operational life, maintenance or safety of operational elements.
 - (5) Visual qualities of sight-exposed elements.
- B. Contractor's Request shall also include:
 - (1) Identification of Project.
 - (2) Description of affected Work.
 - (3) Necessity for cutting, alteration, or excavations.
 - (4) Effects of Work on District, other trades, or structural or weatherproof integrity of Project.
 - (5) Description of proposed Work:
 - (a) Scope of cutting, patching, alteration, or excavation.
 - (b) Trades that will execute Work.
 - (c) Products proposed to be used.
 - (d) Extent of refinishing to be done.
 - (6) Alternates to cutting and patching.
 - (7) Cost proposal, when applicable.
 - (8) The scheduled date the Contractor intends to perform the Work and the duration of time to complete the Work.
 - (9) Written permission of District or other District contractor(s) whose work will be affected.

1.04 QUALITY ASSURANCE:

- A. Contractor shall ensure that cutting, fitting, and patching shall achieve security, strength, weather protection, appearance for aesthetic match, efficiency, operational life, maintenance, safety of operational elements, and the continuity of existing fire ratings.
- B. Contractor shall ensure that cutting, fitting, and patching shall successfully duplicate undisturbed adjacent profiles, materials, textures, finishes, colors, and that materials shall match existing construction. Where there is dispute as to whether duplication is successful or has been achieved to a reasonable degree, the District's decision shall be final.

1.05 PAYMENT FOR COSTS:

- A. Cost caused by ill-timed or defective Work or Work not conforming to Contract Documents, including costs for additional services of the District, its consultants, including but not limited to the Construction Manager, the Architect, the Project Inspector(s), Engineers, and Agents, will be paid by Contractor and/or deducted from the Contract by the District.
- B. District shall only pay for cost of Work if it is part of the original Contract Price or if a change has been made to the contract in compliance with the provisions of the General Conditions. Cost of Work performed upon instructions from the District, other than defective or nonconforming Work, will be paid by District on approval of written Change Order. Contractor shall provide written cost proposals prior to proceeding with cutting and patching.

PART 2 - PRODUCTS

2.01 MATERIALS:

- A. Contractor shall provide for replacement and restoration of Work removed. Contractor shall comply with the Contract Documents and with the Industry Standard(s), for the type of Work, and the Specification requirements for each specific product involved. If not specified, Contractor shall first recommend a product of a manufacturer or appropriate trade association for approval by the District.
- B. Materials to be cut and patched include those damaged by the performance of the Work.

PART 3 – EXECUTION

3.01 INSPECTION:

- A. Contractor shall inspect existing conditions of the Site and the Work, including elements subject to movement or damage during cutting and patching, excavating and backfilling. After uncovering Work, Contractor shall inspect conditions affecting installation of new products.

- B. Contractor shall report unsatisfactory or questionable conditions in writing to District as indicated in the General Conditions and shall proceed with Work as indicated in the General Conditions by District.

3.02 PREPARATION:

- A. Contractor shall provide shoring, bracing and supports as required to maintain structural integrity for all portions of the Project, including all requirements of the Project.
- B. Contractor shall provide devices and methods to protect other portions of Project from damage.
- C. Contractor shall, provide all necessary protection from weather and extremes of temperature and humidity for the Project, including without limitation, any work that may be exposed by cutting and patching Work. Contractor shall keep excavations free from water.

3.03 ERECTION, INSTALLATION AND APPLICATION:

- A. With respect to performance, Contractor shall:
 - (1) Execute fitting and adjustment of products to provide finished installation to comply with and match specified tolerances and finishes.
 - (2) Execute cutting and demolition by methods that will prevent damage to other Work, and provide proper surfaces to receive installation of repairs and new Work.
 - (3) Execute cutting, demolition excavating, and backfilling by methods that will prevent damage to other Work and damage from settlement.
- B. Contractor shall employ original installer or fabricator to perform cutting and patching for:
 - (1) Sight-exposed finished surfaces.
- C. Contractor shall execute fitting and adjustment of products to provide a finished installation to comply with specified products, functions, tolerances, and finishes as shown or specified in the Contract Documents including, without limitation, the Drawings and Specifications.
- D. Contractor shall fit Work airtight to pipes, sleeves, conduit, and other penetrations through surfaces. Contractor shall conform to all Code requirements for penetrations or the Drawings and Specifications, whichever calls for a higher quality or more thorough requirement. Contractor shall maintain integrity of both rated and non-rated fire walls, ceilings, floors, etc.
- E. Contractor shall restore Work which has been cut or removed. Contractor shall install new products to provide completed Work in accordance with requirements of the Contract Documents and as required to match surrounding areas and surfaces.

- F. Contractor shall refinish all continuous surfaces to nearest intersection as necessary to match the existing finish to any new finish.

END OF DOCUMENT

ALTERATION PROJECT PROCEDURES

PART 1 – GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Integration of Work, Purchase of Materials and Equipment, Uncovering of Work and Non-conforming Work and Correction of Work and Trenches;
- B. Special Conditions.

PART 2 - PRODUCTS

2.01 PRODUCTS FOR PATCHING AND EXTENDING WORK:

- A. New Materials: As specified in the Contract Documents including, without limitation, in the Specifications, Contractor shall match existing products, conditions, and work for patching and extending work.
- B. Type and Quality of Existing Products: Contractor shall determine by inspection, by testing products where necessary, by referring to existing conditions and to the Work as a standard.

PART 3 - EXECUTION

3.01 EXAMINATION:

- A. Contractor shall verify that demolition is complete and that areas are ready for installation of new Work.
- B. By beginning restoration Work, Contractor acknowledges and accepts the existing conditions.

3.02 PREPARATION:

- A. Contractor shall cut, move, or remove items as necessary for access to alterations and renovation Work. Contractor shall replace and restore these at completion.
- B. Contractor shall remove unsuitable material not as salvage unless otherwise indicated in the Contract Documents. Unsuitable material may include, without limitation, rotted wood, corroded metals, and deteriorated masonry and concrete. Contractor shall replace materials as specified for finished Work.

- C. Contractor shall remove debris and abandoned items from all areas of the Site and from concealed spaces.
- D. Contractor shall prepare surface and remove surface finishes to provide for proper installation of new Work and finishes.

3.03 INSTALLATION:

- A. Contractor shall coordinate Work of all alternations and renovations to expedite completion and to accommodate District occupancy.
- B. Designated Areas and Finishes: Contractor shall complete all installations in all respects, including operational, and electrical work.
- C. Contractor shall remove, cut, and patch Work in a manner to minimize damage and to provide a means of restoring Products and finishes to original or specified condition.
- D. Contractor shall refinish visible existing surfaces to remain to specified condition for each material, with a neat and square or straight transition to adjacent finishes.
- E. Contractor shall install products as specified in the Contract Documents, including without limitation, the Specifications.

3.04 TRANSITIONS:

- A. Where new Work abuts or aligns with existing, Contractor shall perform a smooth and even transition. Patched Work must match existing adjacent work in texture and appearance.
- B. When finished surfaces are cut so that a smooth transition with new Work is not possible, Contractor shall terminate existing surface along a straight line at a natural line of division and make a recommendation for resolution to the District and the Architect for review and approval.

3.05 ADJUSTMENTS:

- A. Where a change of plane of 1/4 inch or more occurs, Contractor shall submit a recommendation for providing a smooth transition to the District and the Architect for review and approval.
- B. Contractor shall fit Work at penetrations of surfaces.

3.06 REPAIR OF DAMAGED SURFACES:

- A. Contractor shall patch or replace portions of existing surfaces, which are damaged, lifted, discolored, or showing other imperfections, in the area where the Work is performed.
- B. Contractor shall repair substrate prior to patching finish.

3.07 CULTIVATED AREAS AND OTHER SURFACE IMPROVEMENTS:

- A. Cultivated or planted areas and other surface improvements which are damaged by actions of the Contractor shall be restored by Contractor to their original condition or better, where indicated.
- B. Contractor shall protect and replace, if damaged, all existing guard posts, barricades, and fences.
- C. Contractor shall give special attention to avoid damaging or killing trees, bushes and/or shrubs on the Premises and/or identified in the Contract Documents, including without limitation, the Drawings.

3.08 FINISHES:

- A. Contractor shall finish surfaces as specified in the Contract Documents, including without limitations, the provisions of all Divisions of the Specifications.
- B. Contractor shall finish patches to produce uniform finish and texture over entire area. When finish cannot be matched, Contractor shall refinish entire surface to nearest intersections.

3.09 CLEANING:

- A. Contractor shall continually clean the Site and the Premises as indicated in the Contract Documents, including without limitation, the provisions in the General Conditions and the Specifications regarding cleaning.

END OF DOCUMENT

CONTRACT CLOSEOUT AND FINAL CLEANING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Completion of Work;
- B. Special Conditions;
- C. Temporary Facilities and Controls.

1.02 CLOSEOUT PROCEDURES

Contractor shall comply with all closeout provisions as indicated in the General Conditions.

1.03 FINAL CLEANING

- A. Contractor shall execute final cleaning prior to final inspection.
- B. Contractor shall clean interior and exterior glass and all surfaces exposed to view; remove temporary labels, tape, stains, and foreign substances, polish transparent and glossy surfaces, wax and polish new vinyl floor surfaces, vacuum carpeted and soft surfaces.
- C. Contractor shall clean equipment and fixtures to a sanitary condition.
- D. Contractor shall replace filters of operating equipment.
- E. Contractor shall clean debris from roofs, gutters, down spouts, and drainage systems.
- F. Contractor shall clean Site, sweep paved areas, and rake clean landscaped surfaces.
- G. Contractor shall remove waste and surplus materials, rubbish, and construction facilities from the Site and surrounding areas.

1.04 ADJUSTING

Contractor shall adjust operating products and equipment to ensure smooth and unhindered operation.

1.05 RECORD DOCUMENTS AND SHOP DRAWINGS

- A. Contractor shall legibly mark each item to record actual construction, including:
 - (1) Measured depths of foundation in relation to finish floor datum.
 - (2) Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permit surface improvements.
 - (3) Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.
 - (4) Field changes of dimension and detail.
 - (5) Details not on original Contract Drawings
 - (6) Changes made by modification(s).
 - (7) References to related Shop Drawings and modifications.
- B. Contractor will provide one set of Record Drawings to District.
- C. Contractor shall submit all required documents to District and/or Architect prior to or with its final Application for Payment.

1.06 INSTRUCTION OF DISTRICT PERSONNEL

- A. Before final inspection, at agreed upon times, Contractor shall instruct District's designated personnel in operation, adjustment, and maintenance of products, equipment, and systems.
- B. For equipment requiring seasonal operation, Contractor shall perform instructions for other seasons within six months or by the change of season.
- C. Contractor shall use operation and maintenance manuals as basis for instruction. Contractor shall review contents of manual with personnel in detail to explain all aspects of operation and maintenance.
- D. Contractor shall prepare and insert additional data in Operation and Maintenance Manual when the need for such data becomes apparent during instruction.
- E. Contractor shall review contents of manual with personnel in detail to explain all aspects of operation and maintenance.

1.07 SPARE PARTS AND MAINTENANCE MATERIALS

- A. Contractor shall provide products, spare parts, maintenance, and extra materials in quantities specified in the Specifications and in Manufacturer's recommendations.

- B. Contractor shall provide District with all required Operation and Maintenance Data at one time. Partial or piecemeal submissions of Operation and Maintenance Data will not be accepted.

PART 2 – PRODUCTS Not Used.

PART 3 – EXECUTION Not Used.

END OF DOCUMENT

OPERATION AND MAINTENANCE DATA

PART 1 – GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Completion of the Work;
- B. Special Conditions.

1.02 QUALITY ASSURANCE:

Contractor shall prepare instructions and data by personnel experienced in maintenance and operation of described products.

1.03 FORMAT:

- A. Contractor shall prepare data in the form of an instructional manual entitled "OPERATIONS AND MAINTENANCE MANUAL & INSTRUCTIONS" ("Manual").
- B. Binders: Contractor shall use commercial quality, 8-1/2 by 11 inch, three-side rings, with durable plastic covers; two inch maximum ring size. When multiple binders are used, Contractor shall correlate data into related consistent groupings.
- C. Cover: Contractor shall identify each binder with typed or printed title "OPERATION AND MAINTENANCE MANUAL & INSTRUCTIONS"; and shall list title of Project and identify subject matter of contents.
- D. Contractor shall arrange content by systems process flow under section numbers and sequence of Table of Contents of the Contract Documents.
- E. Contractor shall provide tabbed fly leaf for each separate product and system, with typed description of product and major component parts of equipment.
- F. Text: The content shall include Manufacturer's printed data, or typewritten data on 24 pound paper.
- G. Drawings: Contractor shall provide with reinforced punched binder tab and shall bind in with text; folding larger drawings to size of text pages.

1.04 CONTENTS, EACH VOLUME:

- A. Table of Contents: Contractor shall provide title of Project; names, addresses, and telephone numbers of the Architect, any engineers, subconsultants, Subcontractor(s), and Contractor with name of responsible parties; and schedule of products and systems, indexed to content of the volume.

- B. For Each Product or System: Contractor shall list names, addresses, and telephone numbers of Subcontractor(s) and suppliers, including local source of supplies and replacement parts.
- C. Product Data: Contractor shall mark each sheet to clearly identify specific products and component parts, and data applicable to installation. Delete inapplicable information.
- D. Drawings: Contractor shall supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams. Contractor shall not use Project Record Documents as maintenance drawings.
- E. Text: Contractor shall include any and all information as required to supplement product data. Contractor shall provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions.
- F. Warranties and Bonds: Contractor shall bind in one copy of each.

1.05 MANUAL FOR MATERIALS AND FINISHES:

- A. Building Products, Applied Materials, and Finishes: Contractor shall include product data, with catalog number, size, composition, and color and texture designations. Contractor shall provide information for re-ordering custom manufactured products.
- B. Instructions for Care and Maintenance: Contractor shall include Manufacturer's recommendations for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.
- C. Moisture Protection and Weather Exposed Products: Contractor shall include product data listing applicable reference standards, chemical composition, and details of installation. Contractor shall provide recommendations for inspections, maintenance, and repair.
- D. Additional Requirements: Contractor shall include all additional requirements as specified in the Specifications.
- E. Contractor shall provide a listing in Table of Contents for design data, with tabbed fly sheet and space for insertion of data.

1.06 MANUAL FOR EQUIPMENT AND SYSTEMS:

- A. Each Item of Equipment and Each System: Contractor shall include description of unit or system, and component parts and identify function, normal operating characteristics, and limiting conditions. Contractor shall include performance curves, with engineering data and tests, and complete nomenclature, and commercial number of replaceable parts.
- B. Panelboard Circuit Directories: Contractor shall provide electrical service characteristics, controls, and communications.

- C. Contractor shall include color coded wiring diagrams as installed.
- D. Operating Procedures: Contractor shall include start-up, break-in, and routine normal operating instructions and sequences. Contractor shall include regulation, control, stopping, shut-down, and emergency instructions. Contractor shall include summer, winter, and any special operating instructions.
- E. Maintenance Requirements: Contractor shall include routine procedures and guide for trouble-shooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.
- F. Contractor shall provide servicing and lubrication schedule, and list of lubricants required.
- G. Contractor shall include manufacturer's printed operation and maintenance instructions.
- H. Contractor shall include sequence of operation by controls manufacturer.
- I. Contractor shall provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.
- J. Contractor shall provide control diagrams by controls manufacturer as installed.
- K. Contractor shall provide Contractor's coordination drawings, with color coded piping diagrams as installed.
- L. Contractor shall provide charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams.
- M. Contractor shall provide list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.
- N. Additional Requirements: Contractor shall include all additional requirements as specified in Specification(s).
- O. Contractor shall provide a listing in Table of Contents for design data, with tabbed fly sheet and space for insertion of data.

1.07 SUBMITTAL:

- A. Contractor shall submit to the District for review two (2) copies of preliminary draft or proposed formats and outlines of the contents of the Manual within thirty (30) days of Contractor's start of Work.
- B. For equipment, or component parts of equipment put into service during construction and to be operated by District, Contractor shall submit draft content for that portion of the Manual within ten (10) days after acceptance of that equipment or component.

- C. Contractor shall submit two (2) copies of a complete Manual in final form prior to final Application for Payment. Copy will be returned with Architect/Engineer comments. Contractor must revise the content of the Manual as required by District prior to District's approval of Contractor's final Application for Payment.
- D. Contractor must submit two (2) copies of revised Manual in final form within ten (10) days after final inspection.

PART 2 – PRODUCTS Not Used.

PART 3 – EXECUTION Not Used.

END OF DOCUMENT

WARRANTIES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Warranty/Guarantee Information;
- B. Special Conditions.

1.02 FORMAT

- A. Binders: Contractor shall use commercial quality, 8-1/2 by 11 inch, three-side rings, with durable plastic covers; two inch maximum ring size.
- B. Cover: Contractor shall identify each binder with typed or printed title "WARRANTIES" and shall list title of Project.
- C. Table of Contents: Contractor shall provide title of Project; name, address, and telephone number of Contractor and equipment supplier; and name of responsible principal. Contractor shall identify each item with the number and title of the specific Specification, document, provision, or section in which the name of the product or work item is specified.
- D. Contractor shall separate each warranty with index tab sheets keyed to the Table of Contents listing, providing full information and using separate typed sheets as necessary. Contractor shall list each applicable and/or responsible Subcontractor(s), supplier(s), and/or manufacturer(s), with name, address, and telephone number of each responsible principal(s).

1.03 PREPARATION:

- A. Contractor shall obtain warranties, executed in duplicate by each applicable and/or responsible subcontractor(s), supplier(s), and manufacturer(s), within ten (10) days after completion of the applicable item or work. Except for items put into use with District's permission, Contractor shall leave date of beginning of time of warranty blank until the date of completion is determined.
- B. Contractor shall verify that documents are in proper form, contain full information, and are notarized, when required.
- C. Contractor shall co-execute submittals when required.
- D. Contractor shall retain warranties until time specified for submittal.

1.04 TIME OF SUBMITTALS:

- A. For equipment or component parts of equipment put into service during construction with District's permission, Contractor shall submit a draft warranty for that equipment or component within ten (10) days after acceptance of that equipment or component.
- B. Contractor shall submit for District approval all warranties and related documents within ten (10) days after date of completion. Contractor must revise the warranties as required by the District prior to District's approval of Contractor's final Application for Payment.
- C. For items of work delayed beyond date of completion, Contractor shall provide an updated submittal within ten (10) days after acceptance, listing the date of acceptance as start of warranty period.

PART 2 - PRODUCTS Not Used.

PART 3 – EXECUTION Not Used.

END OF DOCUMENT

(Letterhead of Contractor)

STANDARD GUARANTEE / WARRANTY

for

Project Name

Contract No.

We hereby warrant that the Work we have provided under the above reference Contract has been completed in accordance with the Drawings, Specifications, and other Contract Documents.

Under the terms of this warranty, we agree to repair or replace any or all of our work, together with any other adjacent work which may be displaced or damaged by so doing, which may prove to be either patently defective in its workmanship or latently defective in its workmanship or materials within the period of 24 months from the date of filing of the Notice of Completion of the above named Project by the Board of Trustees of the School District, and we also agree to repair any and all damages resulting from such defects, without any expense whatsoever to said Board of Trustees, ordinary wear and tear and unusual abuse or neglect excepted.

In the event of our failure to comply with above-mentioned guarantee conditions within ten (10) day after being notified in writing by the Owner, we collectively and separately do hereby authorize the Owner to have said defective work and damages repaired or replaced and made good at our expense and will honor and pay the costs and charges therefore upon demand.

SIGNED (Contractor) _____

(Address)

(Printed Name of Authorized Representative)

Signature

(License Number)

(Date of Signing)

COUNTERSIGNED (Owner) _____

(Printed Name of Authorized Representative)

Signature

Date of Filing or Notice of Completion: _____

(Letterhead of Company)

SUBCONTRACTOR STANDARD GUARANTEE / WARRANTY

We hereby warrant that

which we have provided in _____

Name of Project	
-----------------	--

for _____

District _____

has been completed in accordance with Specification Section _____ and requirements of the Contract Documents.

Under the terms of this warranty, we agree to repair or replace any or all of our work, together with any other adjacent work which may be displaced or damaged by so doing, which may prove to be either patently defective in its workmanship or latently defective in its workmanship or materials within a period of 24 months from date of filing the Notice of Completion of the above-named Project by the Board of Trustees of the School District without any expense whatsoever to said Board of Trustees, ordinary wear and tear and unusual abuse or neglect excepted.

In the event of our failure to comply with above-mentioned guarantee conditions within ten (10) day after being notified in writing by the Owner, we collectively and separately do hereby authorize the Owner to have said defective work and damages repaired or replaced and made good at our expense and will honor and pay the costs and charges therefore upon demand.

SIGNED (Subcontractor)

(Signature)

(Company Name)

(Address)

(License Number)

(Date of Signing)

COUNTERSIGNED (General Contractor)

(Signature)

(Company Name)

(Address)

(License Number)

(Date of Signing)

(Letterhead of Company)

SPECIAL EXTENDED WRITTEN GUARANTEE / WARRANTY

We hereby warrant that

which we have provided in

Name of Project

for

District

has been completed in accordance with Specification Section

and requirements of the Contract Documents.

Under the terms of this warranty, we agree to repair or replace any or all of our work, together with any other adjacent work which may be displaced or damaged by so doing, which may prove to be either patently defective in its workmanship or latently defective in its workmanship or materials within a period of

year(s) from date of filing the Notice of Completion of the above-named Project by the Board of Trustees of the School District without any expense whatsoever to said Board of Trustees, ordinary wear and tear and unusual abuse or neglect excepted. We also agree to repair any and all damages resulting from such defects.

In the event of our failure to comply with above-mentioned conditions within a reasonable time but in no case longer than ten (10) calendar days after being notified in writing by the Owner, we collectively and separately do hereby authorize the Owner to have said defective work and damages repaired or replaced and made good at our expense and will honor and pay the costs and charges therefore upon demand.

SIGNED (Subcontractor)

(Name)

(Address)

(License Number)

(Date of Signing)

COUNTERSIGNED (General Contractor)

(Name)

(Address)

(License Number)

(Date of Signing)

RECORD DOCUMENTS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Documents on Work;
- B. Special Conditions.

PART 2 - RECORD DRAWINGS

2.01 GENERAL:

- A. As indicated in the Contract Documents, the District will provide Contractor with one set of reproducible, full size original Contract Drawings (mylars).
- B. Contractor shall maintain at each Project Site one set of marked-up plans and shall transfer all changes and information to those marked-up plans, as often as required in the Contract Documents, but in no case less than once each month. Contractor shall submit to the Project Inspector one set of reproducible vellums of the Project Record Drawings ("As-Built") showing all changes incorporated into the Work since the preceding monthly submittal. The As-Built shall be available at the Project Site. The Contractor shall submit reproducible vellums at the conclusion of the Project following review of the blue line prints.
- C. Label and date each Record Drawing "RECORD DOCUMENT" in legibly printed letters.
- D. All deviations in construction, including but not limited to pipe and conduit locations and deviations caused by without limitation Change Orders, Construction Claim Directives, RFI's, and Addenda, shall be accurately and legibly recorded by Contractor.
- E. Locations and changes shall be done by Contractor in a neat and legible manner and, where applicable, indicated by drawing a "cloud" around the changed or additional information.

2.02 RECORD DRAWING INFORMATION:

- A. Contractor shall record the following information:
 - (1) Locations of Work buried under or outside each building, including, without limitation, all utilities, plumbing and electrical lines, and conduits.

- (2) Actual numbering of each electrical circuit to match panel schedule.
- (3) Locations of significant Work concealed inside each building whose general locations are changed from those shown on the Contract Drawings.
- (4) Locations of all items, not necessarily concealed, which vary from the Contract Documents.
- (5) Installed location of all cathodic protection anodes.
- (6) Deviations from the sizes, locations, and other features of installations shown in the Contract Documents.
- (7) Locations of underground work, points of connection with existing utilities, changes in direction, valves, manholes, catch basins, capped stubouts, invert elevations, etc.
- (8) Sufficient information to locate Work concealed in each building with reasonable ease and accuracy.

In some instances, this information may be recorded by dimension. In other instances, it may be recorded in relation to the spaces in the building near which it was installed.

- B. Contractor shall provide additional drawings as necessary for clarification.
- C. Contractor shall provide reproducible record drawings, made from final Shop Drawings marked "No Exceptions Taken" or "Approved as Noted."
- D. After review and approval of the marked-up specifications by the Project Inspector, Contractor shall provide electronic copies of the drawings (in PDF format) with one file with all of the sheets and one set of individual sheet files at the conclusion of the Project.

PART 3 - RECORD SPECIFICATIONS

3.01 GENERAL:

- A. Contractor shall mark each section legibly to record manufacturer, trade name, catalog number, and supplier of each Product and item of equipment actually installed.
- B. After review and approval of the marked-up specifications by the Project Inspector, Contractor shall provide one electronic copy of the specifications (in PDF format) at the conclusion of the Project.

PART 4 - MAINTENANCE OF RECORD DOCUMENTS

4.01 GENERAL

- A. Contractor shall store Record Documents apart from documents used for construction as follows:

- (1) Provide files and racks for storage of Record Documents.
- (2) Maintain Record Documents in a clean, dry, legible condition and in good order.

B. Contractor shall not use Record Documents for construction purposes.

PART 5 – PRODUCTS Not Used.

END OF DOCUMENT

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes general requirements and procedures for compliance with California Code of Regulations, Title 24, Part 11 California Green Building Standards Code, "CAL-Green".

- 1. Chapter 5- Non-Residential Mandatory Measures.

1.2 RELATED REQUIREMENTS

- A. Pertinent sections specifying erosion control.
- B. Section 01 6116, Volatile Organic Compound (VOC) Restrictions.
- C. Document 01 5013, Construction Waste Management and Disposal.
- D. Document 01 7700, Contract Closeout and Final Cleaning.

1.3 DEFINITIONS

- A. CAL-Green Definitions: Certain terms are defined by CAL-Green in Chapter 5 of the code. Words and terms used in this section shall have the meanings shown therein.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Respond to questions and requests from Architect and the jurisdiction having authority regarding CAL-Green credits that are the responsibility of the Contractor, that depend on product selection or product qualities, or that depend on Contractor's procedures. Document responses as informational submittals.

1.5 SUBMITTALS

- A. CAL-GREEN Submittals: Submit CAL-GREEN submittals required by code and in other Specification Sections.
 - 1. CAL-GREEN submittals are in addition to other submittals. If submitted item is identical to that submitted to comply with other requirements, submit duplicate copies as a separate submittal to verify compliance with indicated CAL-GREEN requirements.
 - 2. Acceptable verification submittals are specified in the related sections.

SUSTAINABLE DESIGN REQUIREMENTS
SECTION 01 8113
3595001

PART 2 - PRODUCTS

2.1 REQUIREMENTS - GENERAL

- A. Provide products and procedures necessary to confirm CAL-GREEN compliance required in this Section. Although other Sections may specify some CAL-GREEN requirements, the Contractor shall determine additional materials, techniques, means, methods and procedures necessary to comply with CAL-GREEN requirements.

2.2 STORM WATER POLLUTION PREVENTION PLAN

- A. Section 5.106.1: Comply with requirements of this code section, local ordinances, General Conditions, Special Provisions, and related sections specifying erosion control.

2.3 OUTDOOR WATER USE

- A. Section 5.304.3.1: Irrigation Controllers: Comply with requirements of this code section, local ordinances and Section 32 8000.

2.4 CONSTRUCTION WASTE REDUCTION

- A. Section 5.408 Construction Waste Management, Diversion and Recycling: Comply with requirements of this code section, local ordinances and Section 01 7419.

2.5 BUILDING MAINTENANCE AND OPERATION

- A. Section 5.410.2.3, 4. Commissioning and Functional Performance Testing: Participate in Commissioning and provide functional performance testing as required by these code sections and as specified in Section 01 9113.
- B. Section 5.410.2.5. Documentation and Training: Provide Operations Training as required by these code sections and as specified in Section 01 7700 and Systems Manual as specified in Section 01 7700.

2.6 POLLUTANT CONTROL

- A. Section 5.504.3 Indoor Air Quality: Comply with requirements of this code section, local ordinances.
- B. Section 5.504.4 Finish Material Pollutant Control: All Finish materials shall comply with requirements of this code section, local ordinances and Section 01 6116.

PART 3 - EXECUTION

3.1 GENERAL

- A. Comply with Document 01 5013, Construction Waste Management and Disposal.

SUSTAINABLE DESIGN REQUIREMENTS
SECTION 01 8113
3595001

- B. Comply with execution requirements of related sections and applicable local codes and ordinances.

END OF SECTION

*p:\sacramento\3595 tracy unified school district\001-000_villalovoz es new shade structures\08 specifications\06 spec\04
final\freiler\01 8113.10_sustainable design requirements (cal-green).docx
Last Updated: April 8, 2019*

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Sealants and backing for interior and exterior joints.

1.2 RELATED REQUIREMENTS

- A. Section 01 6116, Volatile Organic Compound (VOC) Restrictions, for VOC limits pertaining to adhesives, sealants, fillers, primers, and coatings.
- B. Section 01 8113, Sustainable Design Requirements, for CAL-Green general requirements and procedures.
- C. Pertinent Sections specifying sealants or referencing this Section for sealant products and installation requirements.
- ~~D. Section 07 8413, Penetration Firestopping, for sealing joints in fire-resistance-rated construction.~~

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on Drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CAL Green), edition as noted on Drawings, as adopted by the California Division of the State Architect (DSA).
- C. American Concrete Institute (ACI) Publications and Standards:
 - 1. ACI 302.1R: Guide to Concrete Floor and Slab Construction.
 - 2. ACI 360R-10: Guide to Design of Slabs-on-Ground.
- D. ASTM International (ASTM):
 - 1. C834: Standard Specification for Latex Sealants.
 - 2. C919: Standard Practice for Use of Sealants in Acoustical Applications.
 - 3. C920: Standard Specification for Elastomeric Joint Sealants.
 - 4. C1193: Standard Guide for Use of Joint Sealants.
 - 5. C1247: Standard Test Method for Durability of Sealants Exposed to Continuous Immersion in Liquids.
 - 6. C1248: Standard Test Method for Staining of Porous Substrate by Joint Sealants.
 - 7. C1311: Standard Specification for Solvent Release Sealants.
 - 8. C1330: Standard Specification for Cylindrical Sealant Backing for Use with Cold Liquid-Applied Sealants.

JOINT SEALANTS
SECTION 07 9200
3595001

9. C1521: Standard Practice for Evaluating Adhesion of Installed Weatherproofing Sealant Joints.
 10. D1667: Standard Specification for Flexible Cellular Materials - Poly (Vinyl Chloride) Foam (Closed-Cell).
 11. E90: Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements.
- E. Federal Specifications (FS):
1. FS TT-S-001657: Sealing Compound--Single Component, Butyl Rubber Based, Solvent Release Type.
- F. South Coast Air Quality Management District (SCAQMD):
1. Rule 1168: Adhesive and Sealant Applications.
- G. U.S. Food & Drug Administration (FDA):
1. Code of Federal Regulations: Title 21, 21 CFR 177.2600, Rubber Articles Intended for Repeated Use.

1.4 DEFINITIONS

- A. Sealant Terminology in accordance with ASTM C834 and ASTM C920:
1. Type C: Clear / translucent sealant.
 2. Type OP: Opaque pigmented sealant.
 3. Type S: Single component sealant.
 4. Type M: Sealant with two or more components.
 5. Grade NS: Nonsag sealant.
 6. Grade P: Pourable sealant.
 7. Grade -18°C: Sealant with low temperature flexibility tested to -18°C (0°F).
 8. Grade 0°C: Sealant with low temperature flexibility tested to 0°C (32°F).
 9. Grade NF: Sealant does not meet low temperature flexibility requirements.
 10. Class 12-1/2: Sealant capable of handling movement, either contraction or expansion, of 12.5 percent of the original joint width.
 11. Class 25: Sealant capable of handling movement, either contraction or expansion, of 25 percent of the original joint width.
 12. Class 35: Sealant capable of handling movement, either contraction or expansion, of 35 percent of the original joint width.
 13. Class 50: Sealant capable of handling movement, either contraction or expansion, of 50 percent of the original joint width.
 14. Class 100 / 50: Sealant capable of handling movement of 50 percent contraction and 100 percent expansion.
 15. Use Related to Exposure:
 - a. Use NT: Nontraffic.
 - b. Use T: Traffic.
 - c. Use I: Immersible.

16. Use Related to Material:
 - a. Use A: Sealant used in contact with aluminum.
 - b. Use G: Sealant used in contact with glass.
 - c. Use M: Sealant used in contact with mortar.
 - d. Use O: Sealants used in contact with all other materials other than those previously listed.

1.5 ADMINISTRATIVE REQUIREMENTS

- A. Submittal Procedures:
 1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
 2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
 3. Sustainable Design Submittals shall comply with the additional requirement of Section 01 8113, Sustainable Design Requirements.
- B. Pre-Installation Meeting: Conduct at Project site. Review joint application procedures, compatibility tests, adhesion tests, and warranty requirements in a meeting involving Architect, Project Inspector, installer, manufacturer or manufacturer's representative.
- C. Coordination:
 1. Use of different manufacturer's sealant types for application at exterior wall and glazing systems is not permitted. It is required that a single source for silicone sealants be used on this Project. The Contractor is responsible for coordinating compliance with this requirement where installation of sealants is delegated to various Subcontractors installing the exterior envelope systems for the Project.
 2. Contractor shall coordinate and be responsible for compatibility and performance between sealants and other materials, and related Sections using sealants which may be in direct contact with work of this Section or adjacent to the other. Isolate and prevent of incompatibility between sealants in accordance with manufacturer's specifications, recommendations and instructions.

1.6 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated, demonstrate compliance with specified attributes.
 1. Include color chart from manufacturers for each joint sealant product required.
 2. Provide certification by joint sealant manufacturer that materials provided for this Section are 100 percent asbestos-free.
- B. Samples for initial Selection: In form of manufacturer's standard bead samples, consisting of strips of actual products showing full range of colors available, for each product exposed to view.

JOINT SEALANTS

SECTION 07 9200

3595001

- C. Samples for Verification: For each kind and color of joint sealant required, provide Samples with joint sealants in 1/2 inch wide joints formed between two 6 inch long strips of material matching the appearance of exposed surfaces adjacent to joint sealants.
- D. Joint-Sealant Schedule: Include the following information.
 - 1. Joint-sealant application, joint location, and designation.
 - 2. Joint-sealant manufacturer and product name.
 - 3. Joint-sealant formulation.
 - 4. Joint-sealant colors (multiple colors will be required).

1.7 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.
- B. Product Certificates: For each kind of joint sealant and accessory, from manufacturer.
- C. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, indicating that sealants comply with requirements.
 - 1. Preconstruction Compatibility and Adhesion Test Reports from sealant manufacturer, indicating the following:
 - a. Materials forming joint substrates and joint-sealant backings have been tested for compatibility and adhesion with joint sealants.
 - b. Interpretation of test results and written recommendations for primers and substrate preparation needed for adhesion.
 - 2. Preconstruction Field-Adhesion Test Reports: Indicate which sealants and joint preparation methods resulted in optimum adhesion to joint substrates based on testing specified in this Section.
- D. Sustainable Design:
 - 1. General:
 - a. Submit information necessary to establish and document compliance with the California Green Building Standards Code.
 - b. Sustainable design submittals are in addition to other submittals.
 - 2. The following information shall be provided:
 - a. Adhesives and Sealants: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.
- E. Sample of manufacturer's warranty.
- F. Record of Pre-Installation Meeting.

1.8 CLOSEOUT SUBMITTALS

- A. Warranty and Guarantee: Submit executed warranty and extended Contractor guarantee.

1.9 QUALITY ASSURANCE

- A. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for installation of sealants and backing required for this Project.
- B. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.
- C. Single Source Responsibility: Obtain each kind of joint sealant from single source from single manufacturer.
- D. Materials, components, assemblies, workmanship and installation are to be observed by the Project Inspector. Work not so inspected is subject to uncovering and replacement.
- E. Mockups: Install sealant in mockups of assemblies specified in other Sections that are indicated to receive joint sealants specified in this Section. Use materials and installation methods specified in this Section.

1.10 PRECONSTRUCTION TESTING

- A. Preconstruction Testing is not required if joint-sealant manufacturers submit joint preparation data that are based on previous testing, not older than 24 months, of sealant products for adhesion to, and compatibility with, joint substrates and other materials matching those submitted.
- B. Preconstruction Compatibility and Adhesion Testing: Submit to sealant manufacturers, for testing indicated below, samples of materials that will contact or affect joint sealants.
 - 1. Use manufacturer's standard test method to determine whether priming and other specific joint preparation techniques are required to obtain rapid, optimum adhesion of joint sealants to joint substrates.
 - 2. Submit not fewer than eight pieces of each kind of material, including joint substrates, shims, joint-sealant backings, secondary seals, and miscellaneous materials.
 - 3. Schedule sufficient time for testing and analyzing results to prevent delaying the Work.
 - 4. For materials failing tests, obtain joint-sealant manufacturer's written instructions for corrective measures including use of specially formulated primers.
- C. Preconstruction Field-Adhesion Testing: Before installing sealants, field test their adhesion to Project joint substrates as follows:
 - 1. Locate test joints where indicated on Project or, if not indicated, as directed by Architect.
 - 2. Conduct field tests for each kind of sealant and joint substrate indicated.
 - 3. Notify Architect seven days in advance of dates and times when test joints will be erected.
 - 4. Arrange for tests to take place with joint-sealant manufacturer's technical representative present.

JOINT SEALANTS
SECTION 07 9200
3595001

5. Test Method: Test joint sealants according to Method A, Field-Applied Sealant Joint Hand Pull Tab, in Appendix X1 in ASTM C 1193 or Method A, Tail Procedure, in ASTM C 1521.
 - a. For joints with dissimilar substrates, verify adhesion to each substrate separately; extend cut along one side, verifying adhesion to opposite side. Repeat procedure for opposite side.
6. Report whether sealant failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each kind of product and joint substrate. For sealants that fail adhesively, retest until satisfactory adhesion is obtained.
7. Evaluation of Preconstruction Field-Adhesion-Test Results: Sealants not evidencing adhesive failure from testing, in absence of other indications of noncompliance with requirements, will be considered satisfactory. Do not use sealants that fail to adhere to joint substrates during testing.

1.11 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials to project site in original factory wrappings and containers, labeled with identification of manufacturer, product name and designation, color, expiration period for use, pot life, curing time, and mixing instructions for multicomponent materials.
- B. Store and handle materials in compliance with manufacturer's recommendations to prevent their deterioration or damage due to moisture, high or low temperatures, contaminants, or other causes.

1.12 FIELD CONDITIONS

- A. Environmental Conditions: Do not proceed with installation of joint sealants under the following conditions:
 1. When ambient and substrate temperature conditions are outside the limits permitted by joint sealant manufacturer.
 2. When joint substrates are wet.
- B. Joint Width Conditions: Do not proceed with installation of joint sealants where joint widths are less than allowed by joint sealant manufacturer for application indicated.
- C. Joint Substrate Conditions: Do not proceed with installation of joint sealants until contaminants capable of interfering with their adhesion are removed from joint substrates.

1.13 WARRANTY AND GUARANTEE

- A. Manufacturer: In addition to the Contractor's and Subcontractor's Standard Guarantee, furnish Owner with manufacturer's fully executed written warranty for sealant against defects in materials and workmanship for a period of 5 years:
- B. Contractor: in addition to its standard Guarantee under the Contract, furnish Owner a special extended written five-year guarantee, cosigned by installer, for sealant, agreeing to replace any and all joints that leaks or otherwise fails to perform as required within guarantee period as a result of failure of materials or installation workmanship at no additional cost to the Owner.

PART 2 - PRODUCTS

2.1 DESIGN AND PERFORMANCE CRITERIA

- A. Sustainable Design:
 - 1. VOC emissions for field-applied adhesives, sealants, and sealant primers must comply with limits specified in Section 01 6116.
- B. Building Envelope: Make watertight and weatherproof.
 - 1. Exterior work that does not remain watertight and all work which does not retain all properties inherent in the product as stipulated by the manufacturer will be considered faulty.
- C. Provide elastomeric joint sealants that have been produced and installed to establish and to maintain watertight and airtight continuous seals without causing staining or deterioration of joint substrates.
- D. Provide joint sealants for interior applications that have been produced and installed to establish and maintain airtight continuous seals that are water resistant and cause no staining or deterioration of joint substrates.
- E. Design Requirements:
 - 1. Seal building joints with non-sag type sealant.
 - 2. Seal floor joints with self-leveling or slope grade self-leveling type sealant.

2.2 MATERIALS, GENERAL

- A. Compatibility: Provide joint sealants, joint fillers, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by sealant manufacturer based on testing and field experience.
- B. Liquid-Applied Joint Sealants: Comply with ASTM C920 and other requirements indicated for each liquid-applied joint sealant specified, including those referencing ASTM C920 classifications for type, grade, class, and uses related to exposure and joint substrates.
 - 1. Suitability for Immersion in Liquids. Where sealants are indicated for Use I for joints that will be continuously immersed in liquids, provide products that have undergone testing according to ASTM C 1247. Liquid used for testing sealants is deionized water, unless otherwise indicated.
- C. Stain-Test-Response Characteristics: Where sealants are specified to be non-staining to porous substrates, provide products that have undergone testing according to ASTM C 1248 and have not stained porous joint substrates indicated for Project.
- D. Suitability for Contact with Food: Where sealants are indicated for joints that will come in repeated contact with food, provide products that comply with 21 CFR 177.2600.

JOINT SEALANTS
SECTION 07 9200
3595001

E. Colors:

1. General:
 - a. Architect will provide color selections and locations for each sealant type and for Contractor's use.
 - b. Not all locations will have the same color.
 - c. Custom colors **[will] [may]** be required.
2. Provide color of exposed joint sealants to comply with the following:
 - a. Provide colors matching selections made by Architect from manufacturer's full range of colors for products of type indicated.
 - b. Request color selection for exposed products listed without a preselected color.

2.3 SILICONE JOINT SEALANTS

- A. Single-Component, Nonsag, Neutral-Curing Silicone Joint Sealant: ASTM C920, Type S, Grade NS, Class 100 / 50, for Use NT.
 1. Products: The following, or equal:
 - a. The Dow Chemical Company; "DOWSIL" 790.
 - b. Sika Corporation, Construction Products Division; "Sikasil" WS-290.
- B. Single-Component, Nonsag, Neutral-Curing Silicone Joint Sealant: ASTM C920, Type S, Grade NS, Class 50, for Use NT.
 1. Products: The following, or equal:
 - a. Dow Corning Corporation; "DOWSIL 795 Building Sealant".
 - b. Sika Corporation, Construction Products Division; "Sikasil WS-295."
- C. Single-Component, Nonsag, Non-Bleed, Neutral-Curing Silicone Joint Sealant: ASTM C920, Type S, Grade NS, Class 50, for Use G, M, A and O.
 1. Products: The following, or equal:
 - a. The Dow Chemical Company; "DOWSIL 756 SMS."
 - b. Momentive Performance Materials; "SCS9000 SilPruf NB."
- D. Single-Component, Nonsag, One Part RTV Neutral-Curing Silicone Joint Sealant: ASTM C920, Type S, Grade NS, Class 25, designed for adhering to low energy surfaces common in sheet or peel and stick weather resistant barriers.
 1. Products: The following, or equal:
 - a. The Dow Chemical Company; "DOWSIL" 758.
 - b. Sika Corporation, Construction Products Division; "Sikasil-N Plus."
- E. Mildew-Resistant, Single-Component, Acid-Curing Silicone Joint Sealant: ASTM C920, Type S, Grade NS, Class 25, for Use NT, A and O.
 1. Products: The following, or equal:
 - a. The Dow Chemical Company; "DOWSIL 786 Mildew Resistant."

- b. Momentive Performance Materials; GE Silicones “Sanitary SCS1700.”

2.4 URETHANE JOINT SEALANTS

- A. Single-Component, Nonsag, Urethane Joint Sealant: ASTM C920, Type S, Grade NS, Class 35, for Use NT.
 - 1. Products: The following, or equal:
 - a. BASF Master Builders Solutions; “MasterSeal NP 1.”
 - b. Sika Corporation, Construction Products Division; “Sikaflex-1a.”
- B. Multicomponent, Nonsag, Urethane Joint Sealant: ASTM C920, Type M, Grade NS, Class 25, for Use NT, M, A and O.
 - 1. Products: The following, or equal:
 - a. BASF Master Builders Solutions; “MasterSeal NP 2.”
 - b. Sika Corporation, Construction Products Division; “Sikaflex-2c NS.”
- C. Multicomponent Urethane Joint Sealant: ASTM C920; self-leveling, Type M, Grade P, Class 25, Uses T, M, A, O, and approved by manufacturer for wide joints up to 1-1/2 inches.
 - 1. Products: The following or equal:
 - a. BASF Master Builders Solutions; “MasterSeal SL 2.”
 - b. Sika Corporation, Construction Products Division; “Sikaflex 2c SL.”

2.5 BUTYL JOINT SEALANTS

- A. Butyl-Rubber-Based Joint Sealants: ASTM C1311 and FS TT-S-001657, Type I.
 - 1. Products: The following, or equal:
 - a. Bostik, Inc.; “Chem-Calk 300.”
 - b. Pecora Corporation; “BC-158.”

2.6 ACRYLIC LATEX JOINT SEALANTS

- A. Latex Joint Sealant: Acrylic latex or siliconized acrylic latex, nonsag, paintable, nonstaining. ASTM C 834, Type OP, Grade NF.
 - 1. Products: The following, or equal:
 - a. Pecora Corporation; “AC-20.”
 - b. Sherwin Williams; 950A.

2.7 ACOUSTICAL JOINT SEALANTS

- A. Acoustical Sealant; ASTM C834, nonsag, paintable, nonstaining latex sealant. Effectively reduce airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E90.

JOINT SEALANTS
SECTION 07 9200
3595001

1. Products: The following, or equal:
 - a. Pecora Corporation; "AC-20" or "AC-20 FTR" (Fire and Temperature Rated).
 - b. United States Gypsum Company: USG "Sheetrock Acoustical Sealant,"

2.8 JOINT SEALANT BACKING

- A. General: Provide sealant backings of material and type that are nonstaining; are compatible with joint substrates, sealants, primers and other joint fillers; and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.
- B. Cylindrical Sealant Backer Rods: Compressible, non-gassing rod-stock complying with ASTM C1330; polyethylene-jacketed polyurethane foam; butyl-rubber foam; neoprene foam; or other flexible, permanent, durable, non-absorptive closed-cell (Type C), open cell (Type O), or bi-cellular material (Type B) and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.
 1. Open cell rods shall not be used at sealant joints for horizontal surfaces.
 2. Closed cell rods shall not be used at double sealant joints.
- C. Bond-Breaker Tape: Polyethylene tape or other plastic tape as recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint filler materials or joint surfaces at back of joint where such adhesion would result in sealant failure. Provide self-adhesive tape where applicable.

2.9 SEALANT ACCESSORIES AND ADDITIONAL MATERIALS

- A. Primer: Material recommended by joint sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint sealant-substrate tests **[and field tests]**.
- B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming in any way joint substrates and adjacent nonporous surfaces, and formulated to promote optimum adhesion of sealants with joint substrates.
- C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.
- D. Spall Repair Mortar: Two-component structural epoxy binder and sand aggregate, producing a mortar that is easily worked and troweled. Early-set system designed specifically for the repair of industrial concrete floors subject to hard wheeled traffic. Compatible with joint filler and recommended by the joint filler manufacturer in writing.
 1. Products: The following, or equal:
 - a. Metzger/McGuire: "Armor-Hard."

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting joint sealant performance. Do not proceed with installation of joint sealants until unsatisfactory conditions have been corrected.
- B. Commencement of work indicates acceptance of substrates.

3.2 PREPARATION

- A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with recommendations of joint sealant manufacturer and the following requirements:
 - 1. Remove foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.
 - 2. Clean concrete, masonry, unglazed surfaces of ceramic tile, and similar porous joint substrate surfaces by brushing, grinding, blast cleaning, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining from above cleaning operations by vacuuming or blowing out joints with oil-free compressed air.
 - 3. Remove laitance and form release agents from concrete.
 - 4. Clean metal, glass, porcelain enamel, glazed surfaces of ceramic tile, and other nonporous surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants.
- B. Spall Repair: Repair spalled joints in concrete slabs to produce joints of profiles recommended by joint sealer manufacturers.
- C. Joint Priming:
 - 1. Prime joint substrates where indicated or where recommended by joint sealant manufacturer based on preconstruction joint sealant-substrate tests or prior experience.
 - 2. Apply primer to comply with joint sealant manufacturer's recommendations. Confine primers to areas of joint sealant bond; do not allow spillage or migration onto adjoining surfaces.
- D. Masking Tape:
 - 1. Use masking tape where required to prevent contact of sealant with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears.

JOINT SEALANTS
SECTION 07 9200
3595001

2. Remove tape immediately after tooling without disturbing joint seal.
- E. Remove sealant and prepare joints in existing exterior locations as directed by representative of sealant manufacturer specified in this work.

3.3 INSTALLATION OF JOINT SEALANTS

- A. General:
 1. Comply with joint sealant manufacturer's printed installation instructions applicable to products and applications indicated, except where more stringent requirements apply.
 2. Seal around penetrations, holes, gaps, surface mounted fixtures and pipes entering building including light fixtures, mounting brackets and other similar items.
- B. Sealant Installation Standard: Comply with recommendations of ASTM C1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.
- C. Joint Sealants at Building Exterior and Interior:
 1. Seal the following joints with joint sealant:
 - a. Expansion and control joints in exterior walls, copings, parapets.
 - b. Joints between metal panels.
 - c. Joints between door and window frames and adjacent materials.
 - d. Joints between cabinets and countertops and walls.
 - e. Control joints in interior partitions, including portion above ceilings.
 - f. Expansion and control joints in solid exterior soffits.
 - g. Control joints in interior ceilings and soffits.
 2. Apply continuous bead of joint sealant in the following locations during installation of materials specified elsewhere:
 - a. In lap joints of sheet metal construction.
 - b. Roofing panels and roof-related sheet metal and flashing.
 - c. Between partition floor and ceiling tracks and adjacent construction.
 - d. Between end stud of partition and adjacent construction.
 - e. Under door sills and thresholds.
 - 1) Set sills and thresholds in continuous double bead of sealant.
 - 2) Provide sealant at butt ends of thresholds against door frame, around door frame and between threshold and resilient floor covering.
 3. Apply acoustic sealant at acoustic separations to make assembly airtight.
 - a. Seal perimeter and intersections of finish.
 - b. Seal around electrical boxes and other penetrations of finish; seal holes within electrical boxes; seal conduit ends.
 - c. Seal pipes which penetrate acoustic separations.
 4. Apply joint sealant at joints not specifically mentioned above which require sealant to meet the performance criteria cited in this Section.

- D. Installation of Sealant Backer Rods: Install sealant backer rods to comply with the following requirements:
1. Install joint fillers of type indicated to provide support of sealants during application and at position required to produce the cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
 - a. Do not leave gaps between ends of joint fillers.
 - b. Do not stretch, twist, puncture, or tear joint fillers.
 - c. Remove absorbent joint fillers that have become wet prior to sealant application and replace with dry material.
 2. Install bond breaker tape between sealants where backer rods are not used between sealants and joint fillers or back of joints.
- E. Sealant Installation:
1. Install sealants by proven techniques that result in sealants directly contacting and fully wetting joint substrates, completely filling recesses provided for each joint configuration, and providing uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.
 2. Install sealants at the same time sealant backings are installed.
- F. Tooling of Nonsag Sealants:
1. Immediately after sealant application and prior to time skinning or curing begins, tool sealants to form smooth, uniform beads of configuration indicated, to eliminate air pockets, and to ensure contact and adhesion of sealant with sides of joint. Remove excess sealants from surfaces adjacent to joint.
 2. Do not use tooling agents that discolor sealants or adjacent surfaces or are not approved by sealant manufacturer.
 3. Profiles:
 - a. Provide concave joint configuration in accordance with Figure 8A in ASTM C1193, unless otherwise indicated.
 - b. Provide flush joint configuration in accordance with Figure 8B in ASTM C1193, where indicated.
 - c. Provide recessed joint configuration in accordance with Figure 8C in ASTM C1193, of recess depth and at locations indicated.
 - 1) Use masking tape to protect adjacent surfaces of recessed tooled joints.
- G. Joint Fillers in Refrigerated Rooms:
1. Apply joint filler only after rooms have been brought down to the final temperature for five calendar days.
 2. Provide supplemental heat and dual dispensing system as required to apply in strict accordance with the manufacturer's directions.

JOINT SEALANTS

SECTION 07 9200

3595001

3.4 DEFECTIVE WORK

- A. Repair damaged and defective work and eliminate functional and visual defects. Where repair is not possible replace work. Adjust joints for uniform appearance.
- B. Cut out and remove damaged or deteriorated joint sealants immediately so that and installations with repaired areas are indistinguishable from original work.

3.5 CLEANING AND PROTECTION

- A. Clean off excess sealants or sealant smears adjacent to joints as work progresses by methods and with cleaning materials approved by manufacturers of joint sealants and of products in which joints occur.
- B. Clean excess adhesive from exposed surfaces of neoprene compression seal with solvent cleaner as recommended by manufacturer.
- C. Protect joint sealants during and after curing period from contact with contaminating substances or from damage resulting from construction operations or other causes so that they are without deterioration or damage at time of Substantial Completion.

3.6 SEALANT SCHEDULE

- A. General:
 - 1. Joints in construction between interior and exterior spaces and other designated or required locations to provide effective barrier against passage of elements:
 - a. Multicomponent, Nonsag, Urethane Joint Sealant: ASTM C920, Type M, Grade NS, Class 25, for Use NT, M, A and O.
 - b. Single-Component, Nonsag, Urethane Joint Sealant: ASTM C920, Type S, Grade NS, Class 25, for Use NT.
 - 2. Specialty perimeters where required for appearance or weather tightness:
 - a. Multicomponent, Nonsag, Urethane Joint Sealant: ASTM C920, Type M, Grade NS, Class 25, for Use NT, M, A and O; capable of 50 percent extension and compression movement.
 - b. Single-Component, Nonsag, Urethane Joint Sealant: ASTM C920, Type S, Grade NS, Class 35, for Use NT.
 - c. Single-Component, Nonsag, Neutral-Curing Silicone Joint Sealant: ASTM C920, Type S, Grade NS, Class 50, for Use NT.
 - d. Single-Component, Nonsag, Neutral-Curing Silicone Joint Sealant: ASTM C920, Type S, Grade NS, Class 100 / 50, for Use NT.
- B. Exterior Locations:
 - 1. Joints Bordered by Glass: Single-component, nonsag, neutral-curing silicone joint sealant, ASTM C920, Type S, Grade NS, Class 50, for Use NT.
 - 2. Joints Bordered by Plastic: Single-component, nonsag, neutral-curing silicone joint sealant, ASTM C920, Type S, Grade NS, Class 100 / 50, for Use NT.

3. Horizontal Joints in Exterior Walks Abutting Building Walls, Interior Concrete Floors: Multicomponent urethane sealant, self-leveling; ASTM C920, Grade P, Class 25, Uses T, M and A.
 - a. Where walks abut structural slabs or stoops.
 - b. Where walks abut exterior wall of buildings.
 - c. Where exposed interior concrete slabs abut vertical surfaces.
 - d. Where sealant is shown on the Drawings for concrete slabs.
4. Sheet Metal and Roof Accessory Sealants: Types recommended by roofing manufacturer and complying with requirements of this Section.
5. Exterior Sheet Metal Lap Joints: Types recommended by manufacturer and complying with requirements of this Section.
6. Joints Between Concrete Panels, and Between Concrete Panels and Other Work: Single-component, nonsag, neutral-curing silicone joint sealant, ASTM C920, Type S, Grade NS, Class 100 / 50, for Use NT and formulated to reduce or eliminate dirt pickup, surface streaking, and substrate staining.
7. Exterior Metal Panel Butt Joints and Trim: Types recommended by manufacturer and complying with requirements of this Section.
8. Sills and Thresholds: Butyl-rubber-based joint sealants, ASTM C1311.
9. All Other Exterior Joints:
 - a. Single-component, nonsag, neutral-curing silicone joint sealant, ASTM C920, Type S, Grade NS, Class 100 / 50, for Use NT.
 - b. Single-component, nonsag, neutral-curing silicone joint sealant, ASTM C920, Type S, Grade NS, Class 50, for Use NT.
 - c. Around perimeters of frames where door, window and louver frames abut concrete, masonry or other building materials.
 - d. Expansion and control joints in masonry.
 - e. Masonry at dissimilar material or at dissimilar masonry.
 - f. Miscellaneous locations where sealant is shown on Drawings.

C. Interior Locations:

1. Expansion and Control Joints:
 - a. Multicomponent, Nonsag, Urethane Joint Sealant: ASTM C920, Type M, Grade NS, Class 25, for Use NT, M, A and O.
 - b. Single-Component, Nonsag, Urethane Joint Sealant: ASTM C920, Type S, Grade NS, Class 35, for Use NT.
 - c. Around perimeters of frames where door, window and louver frames abut concrete, masonry or other building materials.
 - d. Expansion and control joints in masonry walls.
 - e. Masonry at dissimilar material or at dissimilar masonry.
 - f. At miscellaneous locations where sealant is shown on Drawings.
2. Sills and Thresholds: Butyl-Rubber-based joint sealants, ASTM C1311.

JOINT SEALANTS

SECTION 07 9200

3595001

3. Interior Wet Areas, Around Plumbing Fixtures, Countertops Abutting Walls, Food Service Applications: Mildew-resistant, single-component, acid-curing silicone joint sealant, ASTM C920, Type S, Grade NS, Class 25, for Use NT, A and O.
4. Interior Static Dry Joints as Required to Dress Appearance: Acrylic latex or siliconized acrylic latex joint sealant, ASTM C 834, Type OP, Grade NF
5. Sound Control Applications: Acoustical Sealant, ASTM C 834
 - a. Where Required for Sound Control with Limited Flame Spread: Acoustical sealant, ASTM C 834, fire-rated type.

END OF SECTION

*P:\Sacramento\3595 Tracy Unified School District\001-000_Villalovoz ES New Shade Structures\08 Specifications\06 SPEC\04
FINAL\Freiler\07 9200_Joint Sealants.docx
Last Updated: March 24, 2021*

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Painting and painter's finish on all exposed exterior and interior surfaces, except prefinished items and unless otherwise noted, as required to complete finishing of the Work. The Work includes, but is not necessarily limited to, the following specific items:
1. Paint, stain or otherwise finish all new surfaces.
 2. Back priming of concealed surfaces, except as otherwise specified.
 3. Paint, repaint or finish of existing painted surfaces altered, defaced or damaged as a result of work of this Contract.
 4. Paint site items which are not prefinished, including posts, screens, panels, bollards, supports, rails and other similar improvements.
 5. Mechanical and plumbing vents on roof.
 6. Unpainted or unfinished exposed building components, pipes and conduit, including sprinkler piping, and metal ductwork, which run exposed across finished or painted surfaces.
 7. Painting work in rooms where finishing work is performed, including painting new surfaces as specified and re-painting existing surfaces within the room, unless otherwise indicated. Re-painting existing surfaces shall be with minimum of one coat using specified coatings compatible with existing.
- B. Surface treatment, priming and coats of paint specified in this Section are in addition to shop priming and surface treatment specified under other Sections unless otherwise noted.
- C. Items Not Included in This Section:
1. Factory and shop-prefinished items as specified in various Sections.
 2. Painting specified elsewhere and included in respective Sections, including but not necessarily limited to shop priming.

1.2 WORK NOT TO BE PAINTED UNLESS OTHERWISE INDICATED

- A. Exposed exterior concrete and concrete slab surfaces, except as noted.
- B. Suspended acoustical ceilings and acoustical tile, except as noted.
- C. Pre-finished casework and other factory and shop-prefinished items as specified in various Sections.
- D. Finish hardware except prime coated items.
- E. Items typically not to be painted including, but not limited to, the following:
1. Glass.

PAINTING
SECTION 09 9100
3595001

2. Ceramic tile.
 3. Membrane roofing.
 4. Safety nosings.
 5. Resilient floor covering and base.
 6. Carpet.
 7. Pre-finished paneling.
 8. Plastic laminate.
 9. Porcelain enamel.
 10. Vinyl wallcovering, except where noted.
- F. Aluminum doors, windows, frames and railings.
- G. Metal or plastic toilet partitions.
- H. Items of chromium, copper, nickel, brass, bronze or stainless steel.
- I. Surfaces in concealed areas such as furred spaces.
- J. Tops of gravel stop flanges (including priming) where roofing material will be adhered to.
- K. Wall areas concealed by cases, counters, cabinets, chalkboards, tackboards (prime coat only required).
- L. Piping or conduit including brackets and similar items therewith running on or across unpainted or otherwise unfinished walls or ceilings.
- M. Galvanized gratings, recessed foot grilles, and thresholds.
- N. Structural steel scheduled to receive fireproofing.

1.3 RELATED REQUIREMENTS

- A. Section 01 6116, Volatile Organic Compound (VOC) Restrictions; for VOC limits pertaining to adhesives, sealants, fillers, primers, and coatings.
- B. Section 01 8113, Sustainable Design Requirements, for CAL-Green general requirements and procedures.
- C. Section 07 6200, Sheet Metal Flashing and Trim.
- D. Section 07 9200, Joint Sealants.
- E. Section 09 2900, Gypsum Board.
- F. Divisions 22, 23 and 26, Exposed piping, ductwork and conduit.

1.4 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).

- B. California Green Building Standards Code (CAL Green), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- C. ASTM International (ASTM):
 - 1. D523: Standard Test Method for Specular Gloss.
 - 2. D4263: Standard Test Method for Indicating Moisture in Concrete by the Plastic Sheet Method.
 - 3. D6386: Standard Practice for Preparation of Zinc (Hot-Dip Galvanized) Coated Iron and Steel Product and Hardware Surfaces for Painting.
 - 4. D7396: Standard Guide for Preparation of New, Continuous Zinc-Coated (Galvanized) Steel Surfaces for Painting.
- D. Master Painters Institute (MPI):
 - 1. Architectural Painting Manual Guide Specification.
- E. The Association for Materials Protection and Performance (AMPP):
 - 1. SSPC-Society for Protective Coatings/ National Association of Corrosion Engineers International (NACE):
 - a. SSPC-SP 1: Solvent Cleaning.
 - b. SSPC SP-10/NACE No. 2: Near-White Metal Blast Cleaning.
 - c. SSPC-SP 16: Brush-Off Blast Cleaning of Coated and Uncoated Galvanized Steel, Stainless Steels, and Non-Ferrous Metals.

1.5 ADMINISTRATIVE REQUIREMENTS

- A. Submittal Procedures:
 - 1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
 - 2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
 - 3. Sustainable Design Submittals shall comply with the additional requirement of Section 01 8113, Sustainable Design Requirements.

1.6 ACTION SUBMITTALS

- A. Product Data: Submit list and complete descriptive data of products proposed for use. Include manufacturer's specifications, published warranty or guarantee, and application instructions. Cross-reference to paint system and locations of application areas.
- B. Samples:
 - 1. Appropriately label and identify each sample, including location and application. Include **[Architect's number as scheduled on the Drawings,]** manufacturer's name, color number, and gloss units.
 - 2. Prepare on 8 inch x 10 inch card stock for selected colors and finishes.

PAINTING
SECTION 09 9100
3595001

3. Submit sufficiently ahead of work progress to allow for color board assembly and distribution.
4. Resubmit as requested until required sheen, color, and texture are approved.

1.7 INFORMATIONAL SUBMITTALS

- A. Statement of applicator qualifications.
- B. Sustainable Design:
 1. General:
 - a. Submit information necessary to establish and document compliance with the California Green Building Standards Code.
 - b. Sustainable design submittals are in addition to other submittals.
 2. The following information shall be provided:
 - a. Paints and Coatings: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.

1.8 CLOSEOUT SUBMITTALS

- A. Guarantee: Submit Subcontractor's guarantee.

1.9 MAINTENANCE MATERIAL SUBMITTALS

- A. At completion of the Work, deliver to Owner extra stock of paint of each color used in each coating material used.
- B. Containers shall be full, tightly sealed, and clearly marked.
- C. Provide the following quantities:
 1. Field Colors: 1 five-gallon container.
 2. Accent Colors: 1 one-gallon container.

1.10 QUALITY ASSURANCE

- A. Use only new materials and products.
- B. Single-Source Responsibility:
 1. To the maximum extent practicable, select a single manufacturer to provide all materials required by this Section, using additional manufacturers to provide systems not offered by the selected principal manufacturer.
 2. For each individual system:
 - a. Provide primer and other undercoat paint produced by same manufacturer as finish coat.
 - b. Use thinner within manufacturer's recommended limits.
- C. Source Quality Control: Material shall be best grade products of type specified and listed below as regularly manufactured by these manufacturers. Materials not bearing

manufacturer's identification as standard "best grade product" of their regular line will not be considered for use.

- D. Materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.
- E. Materials and application procedures shall comply with local, state and federal air pollution control regulations.
- F. Manufacturer's representative from coating supplier shall visit the site prior to application to review and approve the specified systems. Discrepancies or recommended changes shall be submitted to the Architect for consideration prior to finalization of submittal.
- G. Site Application Mockup:
 - 1. Prior to ordering materials and unless waived by the Architect in writing, the Contractor shall provide large scale mockup areas for all colors, both interior and exterior, directly applied to the building for final color approval by the Architect.
 - 2. Minimum Size:
 - a. Ceiling Areas: Finish a panel 10 feet square.
 - b. Wall Areas: Finish a panel 8 feet long by full height of wall.
 - c. Finish a portion of other items as directed by Architect.
 - 3. Provide up to 2 adjustments at no extra cost to the Owner.
 - 4. Paint shall not be ordered or applied until such large scale sample(s) have been reviewed and approved by the Architect in writing. These requirements as described herein may be waived by the Architect in writing only.

1.11 DELIVERY, STORAGE AND HANDLING

- A. Deliver undamaged products to job in manufacturer's sealed containers and/or original bundles with tags and labels intact.
- B. Store materials in protected, clean, dry conditions off of ground and in areas which will not interfere with the progress of the Work.
- C. Transport, store and handle in strict accordance with the manufacturer's written recommendations and as specified below.
- D. Remove paint-soiled rags and waste from premises at end of each day's work or store in metal containers with metal covers.
- E. Paint stored at site, shall be in separate structure not less than 60 feet from any other building or structure. Remove empty containers and soiled rags as they accumulate. At completion, remove structure, cleanup area, and leave in original condition.

PAINTING
SECTION 09 9100
3595001

1.12 FIELD CONDITIONS

- A. Do not apply paints and coatings under conditions which jeopardize quality or appearance of painting or finishing.
- B. Cover or otherwise protect finished work of other trades and surfaces not being painted concurrently or not to be painted.
- C. Exterior:
 - 1. Comply with manufacturer's recommendations as to environmental conditions under which coatings and coating systems can be stored and applied.
 - 2. Do not apply exterior paint when air or surface temperature is under 50 degrees F or when air or surface temperature will be below 50 degrees F for 48 hours after painting.
 - 3. Do not apply immediately following snow, rain, dew or during foggy weather.
 - 4. Do not apply when temperature is over 85 degrees F except in protected or shaded areas.
- D. Interior:
 - 1. Do not apply interior paint when air or surface temperature is below 50 degrees F unless temperature is maintained constantly.
 - 2. Do not apply when ventilation is inadequate to maintain humidity lower than dew point of coldest wall.
- E. Use moisture meter for determining proper moisture levels of surfaces for painting.
- F. Report to Architect in writing upon discovery of any prime coat painting specified in other Sections of Specifications that would prevent proper application of specified finish.
- G. Furnish, erect and remove scaffolding and planks required for work under this Section. Conform to state and local codes, rules and regulations.

1.13 EXISTING CONDITIONS

- A. Existing Surfaces:
 - 1. Paint or otherwise finish all existing surfaces as indicated or scheduled on the Drawings.
 - 2. Work includes primer, paint, repaint or finish of existing painted surfaces altered, defaced or damaged as a result of work under this Contract.
- B. Existing surfaces to be painted include:
 - 1. Exterior wall surfaces, including fascia, trim.
 - 2. Soffits and exterior ceilings including exposed roof framing.
 - 3. Doors and frames, both wood and metal.
 - 4. Window frames, trim and solid infill panels except unpainted or prefinished aluminum.

5. Exposed conduit, piping, brackets, supports, and similar metal fabrications.
6. Downspouts and gutters.
7. Parapet caps and exposed flashings.
8. Mechanical well walls, all surfaces.
9. Concrete foundation where exposed below painted wall surfaces.
10. Roll-up doors and frames.
11. Closure panels between relocatable buildings.
12. Enclosure walls, screen walls, equipment yards.
13. Other work as shown on the Drawings, specified, or as required for a complete Project.

1.14 GUARANTEE

- A. Contractor: Under conditions of its Guarantee under the Contract, paint colors shall be substantially unchanged and finishes shall maintain their original adherence without showing blisters, flaking, peeling, scaling, staining or unusual deterioration or other defects.

PART 2 - PRODUCTS

2.1 DESIGN AND PERFORMANCE CRITERIA

- A. Sustainable Design:
 1. VOC emissions for field-applied paints and coatings must comply with limits specified in Section 01 6116.

2.2 MANUFACTURERS AND COATING PRODUCTS

- A. Products are specified under "Paint Systems" in Part 3 below and are manufactured by Kelly-Moore, except as otherwise indicated. Equivalent products to those scheduled manufactured by Sherwin-Williams, PPG Architectural Finishes, Glidden Professional, Benjamin Moore & Co., Dunn-Edwards, Vista, or equal, are acceptable.
- B. Materials selected for coating systems for each type surface shall be the product of a single manufacturer or shall be acceptable to manufacturer of finish coating for system.
- C. If more than one quality level of product type is marketed, use material of highest quality.

2.3 MIXING AND TINTING

- A. Deliver paints and stains ready mixed to jobsite. On-site color mixing or tinting will not be allowed.
- B. Each kind of coating for paint finishes shall be factory-mixed to match approved samples, colors, and ready for immediate application.
- C. Mix proprietary products in strict accordance with manufacturer's printed directions.

PAINTING
SECTION 09 9100
3595001

- D. Thinning, if permitted by manufacturer for a specific coating, shall be in accordance with manufacturer's instructions. Thinning of other products shall be in accordance with standard practice.

2.4 COLORS

- A. Colors shall be as scheduled on the Drawings.
- B. Architect will prepare a color schedule with samples for guidance of painter and reserves right to select, allocate, and vary colors on different surfaces throughout building.
 - 1. Colors selected by Architect may be from manufacturer's full range standard palette or be custom mixed.
 - 2. Unless otherwise indicated on the Drawings, different colors will be selected for different materials such as walls, trim, and doors.
- C. Colors to be selected by the Architect, or where scheduled on the Drawings, are solely for the purpose of conveying color information and do not imply manufacturer's approval or waiver of the requirement that all coatings be from the same manufacturer, unless a specific system is not available from the primary manufacturer.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Prior to the work of this Section, carefully inspect and verify that the installed work of all other trades is complete to the point where this work may properly commence.
- B. Verify that painting may be performed in accordance with the approved design.
- C. In the event of discrepancy, immediately notify Architect. Do not proceed in discrepant areas until discrepancies have been fully resolved.

3.2 PREPARATION

- A. General:
 - 1. Surface preparation and product application shall be in accordance with manufacturer's printed instructions.
 - 2. In addition to prime coats indicated (primer, sealer, filler, undercoat), use two finish coats minimum, and additional coats as required for complete coverage and good appearance of scheduled finish coat.
 - 3. Surfaces to receive new finish shall be properly prepared prior to application of finish coatings.
 - 4. Do not apply paint, enamel, stains or varnishes to wet, damp, dusty, finger-marked, rough, unfinished, or defective surfaces until such defects have been corrected.
- B. Wood - Interior:

1. Thoroughly sandpaper and dust off woodwork; putty nail holes, cracks, and other defects after first coat to match color of paint. Putty where finish will be clear.
2. First coat on wood surfaces shall be sanded smooth. Other coats, except finish coat, shall be lightly sanded and dusted before and between each coat.
3. Smoothing, rubbing and sand-papering shall be sufficient to insure good results. Sand down all raised grain or rough surfaces and re-coat. Knots, pitch pockets and sappy portion of wood, all nail holes, cuts, cracks and other defects in wood shall have any necessary extra treatment to provide proper paint base.

C. Wood – Exterior:

1. Surfaces shall be dry and free of grease and splatters.
2. Rough surfaces shall be sanded smooth. **[Do not sandpaper resawn surfaces.]**
3. At opaque finish, fill nail holes, cracks, open joints, and other defects with filler after priming coat has dried. Exposed nail heads shall be spot primed.
4. Avoid painting surfaces while exposed directly to hot sun.
5. Smooth surfaces shall be sanded thoroughly to allow proper penetration and adhesion. Areas exhibiting tannic acid staining shall receive two coats of primer waiting 24 hours between coats. Sand and prime as soon as possible after installation to avoid UV degradation of unpainted wood surface.
6. Mildew, if present, shall be removed by scrubbing with a commercial mildew wash in accordance with manufacturer's directions.

D. Metals-General:

1. On metal work, only such sanding will be required as is necessary to provide for complete bonding of coats.
2. Steel and ironwork shall be scraped clean of scale, and rust and any grease shall be entirely removed.
3. Touch-up scratched and damaged places on metal priming coats.
4. Galvanized or zinc-coated metal shall be given an approved acid treatment 48 hours before paint is applied.
5. Prep and prime coat factory or shop primed metal products, including metal doors and frames, exposed framing, and other exposed metal if material was not shop primed.
6. Metal surfaces receiving epoxy coatings shall have stripe coat applied at all welds, edges, joints, etc., with epoxy primer prior to application of primer.

E. Metals–Galvanized Surfaces:

1. Surfaces shall be cleaned, and profiled where specified, prior to receiving applied coatings in accordance with ASTM D6386 or ASTM D7396 for sheet products.
 - a. Methods shall be selected based on age of galvanized coating, condition of surface and intended paint coating.
 - b. Care shall be taken not to damage the zinc coating.
 - c. Do not use phosphate treatment on galvanized surfaces scheduled to receive zinc-rich primers.

PAINTING
SECTION 09 9100
3595001

2. Comply with additional recommendations included in the AGA document "Duplex Systems: Painting Over Hot Dip Galvanized Steel."
3. Comply with any additional procedures required by the coating manufacturer.

3.3 REPAINTING EXISTING EXTERIOR SURFACES

A. General:

1. Exterior surfaces required to be re-painted, shall be power washed with surfactant, followed by rinsing to remove all loose coatings, chalk, dirt, efflorescence, oils, and other contaminants that would inhibit bond of new coating.
2. Mold or mildew shall be treated with bleach solution followed by thorough rinsing.
3. Protect openings into interior spaces during power washing including louvers, vents, vent screeds, grilles, to prevent water from entering interior areas including, attics and soffits.

B. Ferrous Metal: Steel framing, metal doors and frames, louvers, metal ductwork, and similar Items:

1. Remove all flaking, peeling and poorly bonded coatings, including rust from metal surfaces using power tool sanders or equivalent equipment. Feather edge remaining coatings.
2. Solvent scrub with MEK, all exposed bare metal, shop applied pretreatment and chalked coatings.
3. Spot prime exposed bare metal and metal pre-treatment prior to application of specified prime coat.

C. Galvanized Metal: Down spouts, wall caps, and Other Exposed Galvanized Metal.

1. Remove all loose, flaking or peeling coatings by scraping, chipping or sanding. Feather all rough edges by sanding.
2. Apply phosphoric acid etch pre-treatment to exposed galvanized metal.

D. Plaster:

1. Remove loose coatings using hand or power tools.
2. Patch plaster areas where original material has cracked, spalled or otherwise been removed with compatible material. Fill areas completely to provide smooth, even surface for refinishing. Spot prime patches prior to proceeding.
3. Patch masonry joints with cracks or missing material with compatible materials.

E. Wood Siding and Trim:

1. Remove loose, flaking or peeling coatings by scraping, chipping or sanding. Feather rough edges by sanding.
2. Surfaces that exhibit moderate to heavy chalk deposits shall be thoroughly cleaned to sound substrate by wire brushing, sanding, or power washing.
3. Spot prime bare wood, exposed nail and fastener heads prior to application of specified prime coat.

4. Glossy surfaces shall be dulled by sanding. Crystalline deposits shall be removed by flushing with water from a hose.
5. Mildew, if present, shall be removed by scrubbing with a commercial mildew wash in accordance with manufacturer's directions.

3.4 CAULKING

- A. Caulk all cracks in finished surfaces.
- B. Seal around any wall openings where original sealant is not fully sealing.
- C. Provide sealant at material transitions and intersections as required.

3.5 PROTECTION

- A. Hardware, fixture canopies, outlet covers, switch plates and other such items shall be removed or loosened and replaced after completing work as required for painting and finishing. Protect items until reinstalled.
- B. Protect work and work of others during progress against damage. Leave such work clean and whole. Correct damage by cleaning, repairing, replacing or repainting as directed.
- C. Provide necessary drop cloths for protection of work. Cover finished surfaces adjacent to work.

3.6 APPLICATION

- A. General:
 1. Do not apply initial coating until moisture content of surface is within limitations recommended by paint manufacturer.
 2. Apply coatings in accordance with manufacturer's recommendations and the additional requirements, as applicable, of the Architectural Painting Manual Guide Specifications for application methods and paint systems.
 3. Flow coat on evenly and well brushed in. Should dead spots occur, touch-up before next coat is applied. Should spots or cracks burn through after final coat is applied, apply additional coats to entire surface as necessary to remedy defects.
 4. Rate of application shall be within limits recommended by paint manufacturer for surface involved.
- B. Thicknesses: Rate of application shall be within limits recommended by paint manufacturer for surface involved and comply with the following.
 1. Paint materials shall be applied in manner to average 1.5 to 3 Dry Mills in thickness for the total number of coats scheduled.
 2. Provide Tooke Dry Mill Coating Inspection Gauge manufactured by Micro Metrics Company to the Project Inspector for inspection of finished coating systems, if requested.

PAINTING
SECTION 09 9100
3595001

- C. Refinish whole area where portion of finish is not acceptable.
- D. Adjust natural finishes as necessary to obtain identical appearance on veneers and solid stock.
- E. Equipment adjacent to walls shall be disconnected, using workers skilled in appropriate trades, and moved to permit wall surfaces to be painted. Following completion of painting, they shall be expertly replaced and reconnected.
- F. Top and bottom edges of all doors shall receive same paint system finish required for door faces.
- G. Do not paint over fire-rating labels, fusible links, or sprinkler heads.

3.7 DEFECTIVE WORK

- A. Painter shall be responsible for damage or unsuitable work, including that caused by improperly prepared surfaces. Refinishing shall be at no cost to the Owner. Repair work damaged during construction; touch-up or refinish as necessary any abraded, stained or otherwise damaged surfaces.

3.8 CLEANING AND PROTECTION

- A. Thoroughly clean any drips, splatters, spills, splashes, etc., from walls, floor or other surfaces, with no damage to those surfaces.
- B. Protect work and materials of this Section prior to and during installation, and protect the installed work and materials of other trades.
- C. In the event of damage, make all repairs and replacements necessary to the approval of the Architect at no additional cost to the Owner.

3.9 PAINT SYSTEMS

- A. General:
 - 1. Only major areas are scheduled, but miscellaneous and similar items and areas within room or space shall be treated with suitable system.
 - 2. This Specification shall serve as guide and is meant to establish procedure and quality. Confer with the Architect to determine exact finish desired.
 - 3. Number of coats scheduled is minimum. Additional coats shall be applied at no additional cost as required to hide base material completely, produce uniform color, and provide required and satisfactory finish.
- B. Gloss and Sheen Ratings: Paint gloss shall be defined as the sheen rating of applied paint, in accordance with the following limits in conformance with Master Painters Institute, Inc. (MPI) Standards according to ASTM D523. Not all of the Gloss Levels are necessarily scheduled or used on this Project.

Gloss Level	Description	Units @ 60 degrees	Units @ 85 degrees
G1	Matte or Flat finish	0 to 5	10 max.
G2	Velvet finish	0 to 10	10 to 35
G3	Eggshell finish	10 to 25	10 to 35
G4	Satin finish	20 to 35	35 min.
G5	Semi-Gloss finish	35 to 70	
G6	Gloss finish	70 to 85	
G7	High-Gloss finish	> 85	

C. Clarification of System Terminology:

1. Interior paint Systems are specified and identified herein by initial letters "INT."
2. Exterior paint Systems are specified and identified herein by initial letters "EXT."
3. The numbers following "INT" and "EXT" for each System identifies the substrate to be coated.
4. Initial numbers for each System identify the substrate to be coated summarized as follows with further clarification included with the System description:

CODE	DESCRIPTION
3.1	Concrete
3.2	Cement Plaster
4	Masonry
5	Metal
6	Wood
9.2	Gypsum Board
9.3	Acoustical Panels and Tile

5. The letter following substrate number identifies the general finish coat chemistry summarized as follows:

CODE	DESCRIPTION
A	Standard acrylic
B	Non-bridging vinyl acrylic
C	Epoxy-like acrylic
D	Semi-transparent stain
E	Elastomeric
F	High performance epoxy-like acrylic
G	Lacquer
H	Aliphatic urethane
I	Fire Retardant Intumescent
J	Acrylic Urethane
K	PVA primer
L	Acrylic primer
M	Premium performance acrylic polymer

6. Hyphenated suffix identifies the topcoat gloss level.

PAINTING
SECTION 09 9100
3595001

3.10 INTERIOR PAINTING SYSTEMS

INT 5.1A-5

Acrylic on Exposed Steel, Not Shop Primed - Gloss Level 5

1 coat	5725 DTM	Acrylic Primer
2 coats	1050 Premium Professional	Latex Semi-Gloss

Note: Modify scheduled finish coat if lower gloss level is selected by Architect.

INT 5.2A-5

Acrylic on Shop Primed Metal Including Hollow Metal Doors & Frames - Gloss Level 5

2 coats	1050 Premium Professional	Latex Semi-Gloss
---------	---------------------------	------------------

Note: Modify scheduled finish coat if higher or lower gloss level is selected by Architect.

INT 5.2M-6

Premium Performance Acrylic on Exposed Metal - Gloss Level 6

1 coat	Devacryl 1440	Waterborne Acrylic
2 coats	Devacryl 1449	100% Acrylic-Gloss

INT 9.2A-1

Acrylic on Gypsum Board - Gloss Level 1; at theater stage

1 coat	971 AcryPlex	PVA Primer/Sealer
2 coats	Speedhide 6-753 by PPG Architectural Finishes	Acrylic Latex Flat Black

INT 9.2A-3

Acrylic on Gypsum Board, textured finish - Gloss Level 3

1 coat	971 AcryPlex	PVA Primer/Sealer
2 coats	1010 Premium Professional	Latex Eggshell

INT 9.2A-5

Acrylic on Gypsum Board, smooth finish - Gloss Level 5

1 coat	971 AcryPlex	PVA Primer/Sealer
2 coats	1050 Premium Professional	Latex Semi-Gloss

Note: Provide additional topcoat at toilet rooms and food service areas.

INT 9.3B-1

Acrylic on Acoustic Panels and Tiles - Gloss Level 1

1 coat	1005 Ceiling Paint	Non-Bridging Vinyl Acrylic Flat
--------	--------------------	---------------------------------

3.11 EXTERIOR PAINTING SYSTEMS

EXT 3.2A-2

Acrylic on Cement Plaster - Gloss Level 2

1 coat	247 AcryShield	Acrylic Masonry Primer
2 coats	1210 Premium Professional	100% Acrylic Low Sheen

EXT 5.1A-5

Acrylic over Unprimed Steel - Gloss Level 5

1 coat	5725 DTM	Metal Primer
2 coats	1215 Premium Professional	100% Acrylic Semi-Gloss

EXT 5.2A-5

Acrylic over Shop Primed Metal Doors and Frames, Steel Frame, Mechanical and Electrical Equipment, and Panels - Gloss Level 5

2 coats	2888 DuraPoxy HP	Acrylic Urethane Semi-Gloss
---------	------------------	-----------------------------

EXT 5.3A-5

Premium Acrylic over Waterborne Primer on Galvanized Metal – Gloss Level 5

Pretreatment	SSPC SP-1	Heavy-duty cleaner
1 coat	5725 DTM	Acrylic Primer
2 coats	1215 Premium Professional	100% Acrylic Semi-Gloss

Note: Provide pretreatment and primer if preparation and primer not applied in shop.

EXT 5.4A-5

Acrylic over Waterborne Primer on Aluminum – Gloss Level 5

Pretreatment	Devco Devprep 88	Heavy-duty cleaner
1 coat	5725 DTM	Acrylic Primer
2 coats	1215 Premium Professional	100% Acrylic Semi-Gloss

Note: Provide pretreatment and primer if preparation and primer not applied in shop.

3.12 MISCELLANEOUS PAINTING

- A. Mechanical and Electrical Equipment, Conduits and Piping: Paint exposed items as scheduled using appropriate system for material and whether or not item has been factory-primed.
- B. Exposed Insulation-Covered Piping: Size with Arabol, or equal latex type adhesive, and apply 2 coats of semi-gloss enamel.
- C. Material Visible through Grilles, Screens, Louvers, Vents and Screens and Exposed Hardware Cloth Screening: Painted flat black to make them as unnoticeable as possible.
- D. Mechanical Equipment: Paint mechanical equipment housings where indicated on the Drawings.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Metal-framed porcelain enamel markerboards.
 - 2. Horizontal sliding markerboards.

1.2 RELATED REQUIREMENTS

- A. Section 01 6116, Volatile Organic Compound (VOC) Restrictions; for VOC limits pertaining to adhesives, sealants, fillers, primers, and coatings.
- B. Section 01 8113, Sustainable Design Requirements, for CAL-Green general requirements and procedures.
- C. Section 12 3216, Manufactured Plastic-Laminate-Clad Casework.

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CAL Green), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Submittal Procedures:
 - 1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
 - 2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Contract Closeout and Final Cleaning.
 - 3. Sustainable Design Submittals shall comply with the additional requirement of Section 01 8113, Sustainable Design Requirements.

1.5 ACTION SUBMITTALS

- A. Shop Drawings: Submit showing all parts, connections and anchorages, adjacent materials, fully dimensioned and noted. Include in-wall blocking requirements.
- B. Product Data: Manufacturer's complete descriptive data of all products proposed for use. Include manufacturer's specifications, installation instructions, and maintenance instructions.
- C. Samples: The following samples are required.
 - 1. Submit sample for each type of board and trim components to Architect for review.

MARKERBOARDS
SECTION 10 1116
3595001

2. Manufacturer's full range of colors for Architect's selection.

1.6 INFORMATIONAL SUBMITTALS

A. Sustainable Design:

1. General:
 - a. Submit information necessary to establish and document compliance with the California Green Building Standards Code.
 - b. Sustainable design submittals are in addition to other submittals.
2. The following information shall be provided:
 - a. Adhesives and Sealants: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.
 - b. Composite Wood: Evidence of compliance that products meet formaldehyde limits of current CARB Airborne Toxic Control Measure (ATCM) as specified in Section 01 6116.

B. Sample of manufacturer's warranty.

1.7 CLOSEOUT SUBMITTALS

- A. Warranty/Guarantee: Submit executed warranty and Subcontractor's guarantee.

1.8 QUALITY ASSURANCE

- A. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.
- B. Single Source Responsibility: Use materials and products of one manufacturer whenever possible.
- C. Materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.

1.9 DELIVERY, STORAGE AND HANDLING

- A. Deliver undamaged products to job in manufacturer's sealed containers and/or original bundles with tags and labels intact.
- B. Store materials in protected, dry conditions off of ground and in areas so as to not interfere with the progress of the work.
- C. Transport, store and handle in strict accord with the manufacturer's written recommendations.

1.10 WARRANTY

- A. Manufacturer: In addition to the Contractor's and Subcontractor's Guarantee, furnish Owner with the following manufacturer's fully executed written warranties against defects in materials and workmanship including against warping of sliding panel units.

1. Dry Erase Markerboards: Lifetime of the building.
2. Other Products: As available from the manufacturer.

PART 2 - PRODUCTS

2.1 DESIGN AND PERFORMANCE CRITERIA

- A. Sustainable Design:
1. VOC emissions for field-applied adhesives, sealants, and sealant primers must comply with limits specified in Section 01 6116.
 2. Composite wood products must meet current formaldehyde emission limits of CARB Airborne Toxic Control Measure (ATCM) as specified in Section 01 6116.

2.2 HORIZONTAL SLIDING MARKERBOARDS

- A. Manufacturer and Product: Top hung sliding panels and fixed back panels; "Horizontal Sliding Units" by Claridge Products and Equipment, Inc., 800-434-4610 as specified, or equal.
1. Frame: Frame and exposed metal members to be of 6063-T5 alloy, anodized satin finish, aluminum extrusions.
 2. Tray: 2-3/4 inch deep aluminum tray with end closures.
 3. Map Rail: Full length aluminum map rail with cork insert furnished with one combination hook/clip for each 24 inch of length and two flag holders.
 4. Hardware: Rolling hardware to be nylon tipped, ball bearing rollers of sufficient size and number to enable smooth and easy operation of panels.
 5. Tracks: As standard with manufacturer for number of panels at each configuration.
 6. Panel Finish: Sliding panel units and back fixed panel shall be specified markerboard.
 7. Dimensions:
 - a. Overall Size: Typical units, unless indicated otherwise, shall be 3 panels 7'-0" wide x 4'-0" high each.
 - b. Where other sizes are shown, markerboards within sliding Units shall not exceed 5'-6" in width.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Prior to installation, carefully examine and verify that the installed work of all other trades is complete to the point where this installation may properly commence.
- B. Verify that specified items may be installed in accord with the approved designs.
- C. In the event of discrepancy, immediately notify Architect. Do not proceed in discrepant areas until discrepancies have been fully resolved.

MARKERBOARDS

SECTION 10 1116

3595001

3.2 INSTALLATION – MARKERBOARDS

- A. Install items where indicated on the Drawings, in full accord with all reviewed shop drawings and the manufacturer's recommendations, anchoring components firmly in place for long life under hard use.

3.3 PROTECTION

- A. Protect work and materials of this Section prior to and during installation, and protect the installed work and materials of other trades.
- B. In the event of damage, make all repairs and replacements necessary to the approval of the Architect at no additional cost to the Owner.

END OF SECTION

*p:\sacramento\3595 tracy unified school district\001-000_villalovoz es new shade structures\08 specifications\06 spec\04
final\freiler\10 1116_markerboards.docx
Last Updated: March 30, 2021*

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Code required signage.
 - 2. Exterior building identification and other non-code signage.

1.2 RELATED REQUIREMENTS

- A. Section 01 6116, Volatile Organic Compound (VOC) Restrictions; for VOC limits pertaining to adhesives, sealants, fillers, primers, and coatings.
- B. Section 01 8113, Sustainable Design Requirements, for CAL-Green general requirements and procedures.
- C. Division 26, Electrical.
- D. Signage requirements included on the Drawings.

1.3 REFERENCES AND STANDARDS

- A. California Building Code, edition as noted on the drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CAL Green), edition as noted on drawings, as adopted by the California Division of the State Architect (DSA).
- C. Title 19, CCR, Article 33.01(i).
- D. American National Standards Institute (ANSI):
 - 1. A-117.1: Accessible and Usable Buildings and Facilities.
- E. ASTM International (ASTM):
 - 1. A53/A53M: Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
 - 2. A153/A153M: Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Submittal Procedures:
 - 1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.

SIGNAGE
SECTION 10 1400
3595001

2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
3. Sustainable Design Submittals shall comply with the additional requirement of Section 01 8113, Sustainable Design Requirements.

B. Coordination:

1. Prior to production of shop drawings and samples, coordinate a pre-submittal conference with Architect to confirm submittal requirements, schedule, and sign review process.
2. For signs supported by or anchored to permanent construction, advise installers of anchorage devices about specific requirements for placement of anchorage devices and similar items to be used for attaching signs. Provide template for placement of sign-anchorage devices and electrical service embedded in permanent construction by other installers.

1.5 ACTION SUBMITTALS

A. Shop Drawings:

1. Scaled drawings and signage schedule for each sign indicating materials, lettering layout, and colors.
2. Large-scale drawing and details of custom logo and lettering. Include mounting details.
 - a. Include plans, elevations, and large-scale sections of typical members and other components.
 - b. Show mounting methods, grounds, mounting heights, layout, spacing, reinforcement, accessories, and installation details.
3. Font Style. 18 point graphical example of alphabet and numerical numbers 0 through 9 of signage font style, upper and lower case letters, punctuation, 18 point scale, and black text on white paper.

B. Product Data: Submit list and complete descriptive data of all products proposed for use. Include manufacturer's specifications, published warranty or guarantee, installation instructions, and maintenance instructions.

C. Samples:

1. Submit three samples of specified signage fonts to be used for visual and tactile characters including braille below the raised characters.
2. Color Verification: Provide physical sample of each available color from the manufacturer. Include color system name and serial number, code and name as applicable.
3. Control Samples. Samples shall be prepared on same base material to be used in fabrication. Submit one sample of each sign type. Signage types are indicated in Construction Document details. Interior signs shall be full size.

4. Dimensional Letters: One full-size representative samples of each dimensional letter type required, showing letter style, color, and material finish and method of attachment.
5. Symbol of Accessibility and Pictograms. Full scale sample of pictograms and symbol of accessibility to be used on sign panels and graphics.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For installer.
- B. Sustainable Design:
 1. General:
 - a. Submit information necessary to establish and document compliance with the California Green Building Standards Code.
 - b. Sustainable design submittals are in addition to other submittals.
 2. The following information shall be provided:
 - a. Adhesives and Sealants: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.
- C. Sample of manufacturer's warranty.
- D. Signage Schedule and Alphanumeric Nomenclature. As a component of shop drawings and informational submittals, verify with Architect the sign nomenclature; room names and numbers; wording of way-finding, directional and informational signage; text; and orientation of wayfinding pictorial graphics.

1.7 CLOSEOUT SUBMITTALS

- A. Warranty/Guarantee: Submit executed warranty and Subcontractor's guarantee.
- B. Maintenance data for signs and sign types including maintenance manuals.

1.8 QUALITY ASSURANCE

- A. Contractor shall assure that the vendor shall be responsible for the quality of materials and workmanship of any firm acting as the vendor's subcontractor.
- B. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.
- C. Use materials and products of one manufacturer whenever possible.
- D. Materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.
- E. The adhesion of inlaid letters and symbols will be tested. See Article WARRANTY.
- F. Mockups:

SIGNAGE
SECTION 10 1400
3595001

1. Prior to installation, provide a taping pattern for sign plaques.

1.9 DELIVERY, STORAGE AND HANDLING

- A. Deliver undamaged products to job in manufacturer's sealed containers and/or original bundles with tags and labels intact.
- B. Store materials in protected, dry conditions off of ground and in areas so as to not interfere with the progress of the work.
- C. Transport, store and handle in strict accord with the manufacturer's written recommendations.

1.10 FIELD MEASUREMENTS

- A. Make and be responsible for all field dimensions necessary for proper fitting and completion of work. Report discrepancies to Architect before proceeding.

1.11 WARRANTY

- A. Manufacturer: In addition to the Contractor's and Subcontractor's Guarantee, furnish Owner with manufacturer's available fully executed written warranty for signage against all defects in materials and workmanship, including without limitation against yellowing, cracking, crazing, and other visible and performance defects for a period of 5 years.
 1. Text, pictograms or symbols that can be removed from the sign face utilizing a sharp object or other conventional methods will be considered a manufacturing defect.

PART 2 - PRODUCTS

2.1 DESIGN AND PERFORMANCE CRITERIA

- A. Regulatory Standards:
 1. Except as otherwise specified or shown, signage shall conform to the following:
 - a. ANSI A-117.1 and the Americans with Disabilities Act (ADA).
 - b. ATBCB Design Guidelines for Signage in relation to the Americans with Disabilities Act.
 - c. California Code of Regulations, Titles 19 and 24.
 - 1) Contracted Grade 2 Braille shall be used whenever Braille symbols are specifically required. Refer to CBC Section 11B-703.3.
 - 2) All signage shall conform to 2022 CBC Section 11B-703.
 - d. Uniform Sign Code.
 2. When there is a conflict between the CBC and ADA, comply with the most stringent.
- B. Design Criteria: Refer to Chapter 11B of the California Building Code.

1. Raised Characters: Section 11B-703.2.
 - a. Depth: Section 11B-703.2.1.
 - b. Case: Section 11B-703.2.2.
 - c. Style: Section 11B-703.2.3.
 - d. Character Proportions: Section 11B703.2.4.
 - e. Character Height: Section 11B-703.2.5.
 - f. Stroke Thickness: Section 11B-703.2.6.
 - g. Character Spacing: Section 11B-703.2.7.
 - h. Line Spacing: Section 11B-703.2.8.
 - i. Installation Height and Location: Section 11B-703.4.
 2. Braille: Section 11B-703.3.
 - a. Contracted (Grade 2) Braille with rounded or domed dots shall be used wherever Braille is required.
 - 1) Braille dimensions in accordance with Table 11B-703.3.1.
 3. Visual Characters: Section 11B-703.5.
 - a. Character Proportions: Section 11B-703.5.4.
 - b. Stroke Thickness: Section 11B-703.5.7.
 - c. Character Spacing: Section 11B-703.5.8.
 - d. Line Spacing: Section 11B-703.5.9.
 4. Pictograms: Section 11B-703.6.
 - a. Pictogram Field: 11B-703.6.1.
 - 1) Characters and Braille shall not be located in the pictogram field.
 - b. Finish and Contrast: Section 11B-703.6.2.
 - 1) Pictograms and their field shall have a non-glare finish. Pictograms shall contrast with their field with either a light pictogram on a dark field or a dark pictogram on a light field.
 - c. Text Descriptors: Section 11B-703.6.3.
 - 1) Locate text descriptors directly below the pictogram field.
 - 2) Text shall be raised characters with braille directly below.
 5. International Symbol of Accessibility: Section 11B-703.7.2.1.
 6. Toilet Room Door Symbols: Section 11B-703.7.2.6.
 7. Tactile Exit Signs: Tactile exit signage to comply with 1013.4 and 11B-703.4.
- C. Sustainable Design:
1. VOC emissions for field-applied adhesives, sealants, and sealant primers must comply with limits specified in Section 01 6116.

2.2 PLASTIC SIGNS - TACTILE

- A. Materials, Unless Otherwise Noted:

SIGNAGE
SECTION 10 1400
3595001

1. Manufacturer and Product: "Inlaid Tactile Sign" by Accent Signage Systems, Inc. Minneapolis, MN, 800-215-9437 as specified and the basis of design; Ellis & Ellis Sign Systems, Sacramento, CA, 916-924-1936; ASI-Modulex, Los Altos, CA, 650-940-1354; Weidner Architectural Signage, Sacramento, CA; or equal.
 - a. Sign Face: Two 1/8-inch plies with eased edges; New Hermes "Gravo-Tac," or equal.
 - 1) Total Thickness: 1/4 inch.
 - 2) Painted signs will not be accepted.
 - b. Tactile Text: Provide tactile text and "Raster" Braille at plastic tactile signage.
 - 1) Tactile text shall be inlaid into sign face 1/32-inch and raised 1/32- inch minimum above sign face surface.
 - 2) Inlaid text shall be 1-ply, 1/16-inch thick material; "Gravo-Tac" Exterior or equal.
 - 3) Provide text and graphics precisely formed, uniformly opaque to comply with relevant ADA regulations and requirements indicated for size, style, spacing, content, position and colors.
 - 4) Symbols where specified shall be International Style.
 - 5) Braille shall be Contracted (Grade 2) Braille.
 - a) Dots shall be 0.10-inch on centers in each cell, 0.30-inch on center between corresponding dots in adjacent cells, and 0.395-inch minimum to 0.400-inch maximum on center between corresponding dots in cell directly below.
 - b) Dots shall be raised a minimum of 0.025-inch and a maximum of 0.037-inch above the background, and a base diameter of 0.059-inch minimum and 0.063- inch maximum.
 - c) Dots with straight sides and flat tops are not acceptable.
 - c. Colors: High contrast, non-glare, integral colors for graphics.
 - 1) Integral materials shall be U.V. stabilized.
 - 2) Characters, symbols and pictograms shall be in high contrast (light color) with background (dark) color and must conform to the CBC and the ADA Standards.

B. Fabrication:

1. Panel Appearance: Manufacturer's standard, high contrast, semi-matte colors.
2. Surface Texture: Matte Non-glare.
3. Character Style, Size and Layout Position:
 - a. Characters shall be 1-inch high, unless otherwise indicated.
 - b. The stroke of the uppercase letter "I" shall be 15 percent maximum of the height of the character.
 - c. The width of the uppercase letter "O" shall be 60 percent minimum and 110 percent maximum of the height of the uppercase letter "I".

SIGNAGE
SECTION 10 1400
3595001

- d. Character style to be Sans Serif, uppercase, accompanied by Braille directly below text at all locations where raised characters are required.
 - e. Spacing between baselines of separate lines of raised characters with a message shall be 135 percent minimum and 170 percent maximum of the raised character height.
 - 4. Text Schedule: Confirm text, symbols and numbering with the Architect and Owner.
 - 5. Sign Size: As indicated on the Drawings or, if not shown, as reasonably required to accommodate text, symbols and Braille.
 - a. Where signs are installed on window glazing, fabricate a blank sign back to match in size and shape to sign.
 - b. Sign backs shall cover back side of sign from view through window on opposite side of sign.
 - c. Signs that are mounted back-to-back on glazing are to be matching in size; the smaller sign is to be increased in size as reasonably required to match the larger sign.
 - 6. Sign Shape: As indicated on the Drawings.
 - a. Corners: Radiused, unless otherwise shown.
 - 7. Inlaid Letter Adhesion Process: Inlaid material shall be adhered into 1/32-inch deep routed sign face utilizing the heat and pressure bonded/chemically welded process as developed by Accent Signage Systems for the specified "Inlaid Tactile Sign."
 - a. Sign manufacturers for the specified "Inlaid Tactile Sign" shall be familiar with and utilize the exact same manufacturing process developed by Accent Signage Systems.
 - b. Manufacturer must utilize the same and required equipment, products and techniques necessary to produce authentic "Inlaid Tactile Signs" as developed by Accent Signage Systems.
 - c. Other adhesive products and methods, including applied adhesive tapes will not be accepted.
- C. Sign Types: Provide braille translation directly below the raised characters.
- 1. Room Identification Sign: Provide as shown on the Drawings.
 - a. Provide name and room number at each door indicated.
 - b. Names and numbers to be reviewed and approved by Architect and Owner prior to fabrication.
 - c. Allow an average of 4-numbers and 14-letters for each sign.
 - d. Sign to be provided adjacent to doors as shown.
 - 2. Toilet Room Identification Sign: In addition to the specified Door Symbol, provide a Toilet Room Identification Sign at the strike side of every toilet room door.
 - a. Sign shall include an International Symbol of Accessibility, pictogram, and raised characters, specifying the room name with Braille translation below pictogram.
 - 3. Tactile Exit Sign:

SIGNAGE
SECTION 10 1400
3595001

- a. Provide with text in raised characters to read: "EXIT".

2.3 PLASTIC SIGNS - NON-TACTILE

A. Materials, Unless Otherwise Noted:

Manufacturer and Product: Acrylic panel sign as manufactured and distributed by Ellis & Ellis Sign Systems, 916-924-1936, as specified and the basis of design, or equal.

1. Sign Face: 1/4-inch, matt finish, non-glare acrylic with subsurface vinyl and paint. Painted faces will not be accepted.
2. Colors: Colors shall match specified Tactile Signs and as selected by Architect and Owner.
 - a. Integral materials shall be U.V. stabilized.
 - b. Graphics and text shall be in high contrast (dark color) with background (light) color.

B. Fabrication:

1. Sign Thickness: 1/4-inch.
2. Character Style, Size and Layout Position:
 - a. Characters shall be a minimum of 1-inch high, unless otherwise indicated.
 - b. The stroke thickness of the uppercase letter "I" shall be 10 percent minimum and 20 percent maximum of the height of the character.
 - c. The width of the uppercase letter "O" shall be 60 percent minimum and 110 percent maximum of the height of the uppercase letter "I".
 - d. Letter style to be Sans Serif, uppercase.
 - e. Space characters 10 percent minimum and 35 percent maximum of height of characters, measured between two closest points of adjacent characters, excluding word spaces.
 - f. Spacing between baselines of separate lines of characters within a message shall be 135 percent minimum and 170 percent maximum of character height.
3. Text Schedule: Confirm text, symbols and numbering Architect and Owner using the shop drawing/submittal process.
4. Sign Size: As indicated on the Drawings or, if not shown, as reasonably required to accommodate text and symbols.
 - a. Where signs are installed on window glazing, fabricate a blank sign back to match in size and shape to sign.
 - b. Sign backs will cover back side of sign from view through window on opposite side of sign.
5. Sign Shape: As indicated on the Drawings or, as reasonably required to accommodate the specified text and size at lettering.
 - a. Corners: 1/4-inch radius, unless otherwise shown.

C. Sign Types:

1. Toilet Room Door Symbol: Provide one of the following symbols as appropriate to the toilet room type. Toilet Room Door Symbols shall have a color contrast that is distinctly different from the color of the door. Characters, as shown, to be flush with face of symbol. The entire background color must contrast with door. A thin contrasting border around the symbol, with remainder of sign background in a non-contrasting color is not allowed.
 - a. Girls: 12-inch diameter circle, with eased edges.
 - b. Boys: Equilateral triangle with sides 12-inches long, with eased edges.
 - c. Women: 12-inch diameter circle, with eased edges.
 - d. Men: Equilateral triangle with sides 12-inches long, with eased edges.
 - e. Unisex or Staff: equilateral triangle of contrasting color and super imposed on and geometrically inscribed within the face of 12-inch diameter circle, which is a contrasting color to the door. The vertices of the triangle symbol shall be located ¼-inch maximum from the edge of the circle with the vertex pointing upward. Both the circle and triangle to have eased edges.
2. Occupancy Signs (Capacity Sign): Quantity of occupants shall be as indicated on the Drawings or as provided by Architect. Text to read as follows:
 - a. Maximum Number - General: "The number of people permitted in this room shall not exceed _____ by order of the Division of the State Architect."
 - b. Rooms Used for Assembly and Dining: "The number of people permitted in this room shall not exceed _____ for Assembly and _____ for Dining by order of the Division of the State Architect."
3. Assistive Listening System Sign: Provide as indicated on the Drawings.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Prior to installation, carefully inspect and verify that the installed work of other trades is complete to the point where this installation may properly commence.
- B. Verify that specified items may be installed in accordance with the approved design.
- C. In the event of discrepancy, immediately notify Architect. Do not proceed in discrepant areas until discrepancies have been fully resolved.

3.2 INSTALLATION OF SIGNS

- A. General: Locations of signs must be in accordance with the Drawings and approved shop drawings.
- B. Plastic Signs:
 1. General:
 - a. Provide both mechanical fasteners and either adhesive or 2-sided adhesive tape as recommended by manufacturer for given mounting substrate.

SIGNAGE
SECTION 10 1400
3595001

- b. Fasteners: Minimum 4-recessed flush head tamper-proof (vandal-resistant) screws per sign.
- 2. Wood and Metal Framed Walls: Mechanical fasteners shall be of adequate length to penetrate exterior finishes and provide secure embedment into wall structure or sheathing.
- 3. Concrete Walls:
 - a. Use vinyl tape and mounting holes for countersunk, vandal-proof expansion anchors (use both).
- 4. Glass:
 - a. Utilize mounting adhesive and silicone where signs are mounted to glass.
 - b. Provide vinyl window sign backer to match sign face size, mounted on opposite side of glass.
 - c. Signs mounted back-to-back are to be matching in size.
 - d. Do not pre-drill signs for mechanical fastening where sign is to be mounted to glass.
- C. Other Signs: Use mounting method that is permanent, vandal resistant, and has been approved by the Architect.

3.3 PROTECTION

- A. Protect work and materials of this Section and other Sections prior to and during installation, and protect the installed work and materials of all other trades.
- B. In the event of damage, immediately make all repairs and replacements necessary to the approval of the Architect and at no additional cost to the Owner.

3.4 ADJUSTING AND CLEANING

- A. Remove all dust, dirt, finger marks, etc. from signs and letters using cleaning methods as recommended by manufacturer.

END OF SECTION

p:\sacramento\3595 tracy unified school district\001-000_villalovoz es new shade structures\08 specifications\06 spec\04 final\freiler\10 1400_ signage.docx
Last Updated: March 30, 2021

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Toilet accessories.

1.2 RELATED REQUIREMENTS

- A. Division 26, Electrical.

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CAL Green), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Submittal Procedures:
 - 1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
 - 2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
- B. Coordination: Coordinate with other trades as required to ensure proper and adequate provision in framing and wall finish for the installation of the selected toilet accessories in the locations required including recessed items)

1.5 ACTION SUBMITTALS

- A. Shop Drawings: Submit showing parts, connections and anchorages, adjacent materials, fully dimensioned and noted.
- B. Product Data: Submit list of each required accessory and complete descriptive data of products proposed for use. Include manufacturer's specifications, published warranty, installation instructions, and maintenance instructions.

1.6 INFORMATIONAL SUBMITTALS

- A. Sample of manufacturer's warranty.

1.7 CLOSEOUT SUBMITTALS

- A. Warranty/Guarantee: Submit executed warranty and Subcontractor's guarantee.

TOILET ACCESSORIES
SECTION 10 2813
3595001

- B. Keys for lockable accessories.
- C. Maintenance data and operating instructions.

1.8 QUALITY ASSURANCE

- A. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.
- B. Use materials and products of one manufacturer whenever possible.
- C. All materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.

1.9 DELIVERY, STORAGE AND HANDLING

- A. Deliver undamaged products to job in manufacturer's sealed containers and/or original bundles with tags and labels intact.
- B. Store materials in protected, dry conditions off of ground and in areas so as to not interfere with the progress of the Work.
- C. Transport, store and handle in strict accord with the manufacturer's written recommendations.

1.10 FIELD CONDITIONS

- A. Make and be responsible for field dimensions necessary for proper fitting and completion of Work. Report discrepancies to Architect before proceeding.
- B. Verify wall depths are adequate for each item prior to ordering. Notify Architect of conflicts or discrepancies.

1.11 WARRANTY

- A. Manufacturer: In addition to the Contractor's and Subcontractor's Guarantee, furnish Owner with manufacturer's fully executed written warranty for toilet accessories against defects in materials and workmanship, agreeing to replace and install toilet accessories at no additional cost to the Owner, within warranty period as follows:
 - 1. For a period of 3 years.

PART 2 - PRODUCTS

2.1 OWNER FURNISHED CONTRACTOR INSTALLED PRODUCTS

- A. The following products will be furnished by the Owner for installation by Contractor. Provide adequate blocking for attachment. Miscellaneous items are to be provided and installed by Contractor.

1. Toilet Tissue Dispensers.

2.2 DESIGN AND PERFORMANCE CRITERIA

- A. Conform to applicable requirements of ADA and CBC for accessibility. When in conflict, conform to the most stringent.

2.3 MANUFACTURERS

- A. Accessories: Bobrick Washroom Equipment Inc. or Bradley Corporation as specified and the basis of design, unless otherwise noted, or equal.
 1. Manufactured accessories not specified shall require approval as a substitution to be considered equal. Refer to substitution requirements specified in Section 01 3300, Submittal Procedures.
 2. Although multiple manufacturers may be specified for a specific accessory, all accessories shall be the product of a single manufacturer, unless otherwise specified or approved.

2.4 MANUFACTURED UNITS

- A. Grab Bars: 18 gauge 1-1/2 inch outside diameter, type 304 stainless steel welded to 1/8 inch type 304 solid stainless steel wall plates; Bobrick Series B-6806, Bradley 812 Series, or equal.
 1. Configurations and Lengths: As shown.
 2. Grab bar shall withstand a 250 pound point load.
 3. Joints ground and polished.
 4. Finish on Exposed Surfaces: Satin.
 5. Fastening: Concealed, vandal resistant.

2.5 FASTENINGS

- A. Toilet accessories shall be complete with required fastenings.
- B. Fastenings shall either harmonize with the item being fastened, or be of the concealed type.
- C. Exposed fastenings shall be theft and vandal-resistant.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Prior to installation of the Work of this Section, carefully inspect and verify that the installed Work of other trades is complete to the point where this installation may properly commence.
- B. Verify that specified items may be installed in accordance with the approved design.

TOILET ACCESSORIES
SECTION 10 2813
3595001

- C. In the event of discrepancy, immediately notify the Architect. Do not proceed in discrepant areas until discrepancies have been fully resolved.

3.2 PREPARATION

- A. The Contractor shall provide recesses, anchorage and back-up blocking in sizes and in locations as required for proper installation of accessories. Coordinate with other trades where necessary to make provisions for installation.
- B. Securely anchor items in place in locations and at mounting heights indicated. Where specific dimensions are not noted, installation shall be approved by the Architect.
- C. Securely fasten grab bar mounting plates to solid framing or blocking, in accordance with CBC.
- D. Provide cut-outs in toilet partitions for napkin disposal units as required.

3.3 INSTALLATION

- A. Install fixtures, accessories and items in accordance with manufacturers' printed instructions and requirements in the 2022 CBC 11B-603.5 where shown or as approved by Architect.
- B. Mount surface-mounted accessories to solid backing or blocking.
- C. Install plumb and level, securely and rigidly anchored to substrate.
- D. Use concealed vandal-resistant fastenings wherever possible.
 - 1. Adhesive installation not permitted.
 - 2. Provide anchors, bolts and other necessary fasteners, and attach accessories securely to walls or toilet partitions as recommended by manufacturer for each item and each type of substrate condition.
- E. Grab bars: Solidly anchor grab bars to withstand minimum downward pull of 500 pounds between any 2 supports after installation.
- F. Verify type, location and attachment methods of items furnished by Owner to ensure proper preparation of substrate for solid attachment of accessories.
- G. Sealants: Comply with requirements of Section 07 9200, Joint Sealants.
 - 1. Apply behind toilet accessories as necessary to ensure sanitary and watertight integrity of surfaces.
 - 2. Conceal sealants.

3.4 CLEANING AND ADJUSTING

- A. Upon completion of installation, remove manufacturer's temporary labels, marks of identification.
- B. Thoroughly wash surfaces, remove foreign materials, polish surfaces.

TOILET ACCESSORIES
SECTION 10 2813
3595001

- C. Leave entire accessories in neat, orderly, clean, acceptable condition as approved.
- D. Replace damaged parts, surfaces which are not free from imperfections.

3.5 PROTECTION

- A. Protect Work and materials of this Section prior to and during installation, and protect the installed Work and materials of other trades.
- B. In the event of damage, make repairs and replacements necessary to the approval of the Architect at no additional cost to the Owner.
- C. Exposed finish shall be free from scratches, dents, permanent discolorations and other defects in workmanship or material.

END OF SECTION

*p:\sacramento\3595 tracy unified school district\001-000_villalovoz es new shade structures\08 specifications\06 spec\04
final\freiler\10 2813_toilet accessories.docx
Last Updated: April 1, 2021*

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Fire extinguishers, hangers and cabinets.
 - 2. Fire hose and extinguisher cabinet.

1.2 RELATED REQUIREMENTS

- A. Section 09 9100, Painting.

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CAL Green), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Submittal Procedures:
 - 1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
 - 2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.

1.5 ACTION SUBMITTALS

- A. Shop Drawings: Submit showing all parts, connections and anchorages, adjacent materials, fully dimensioned and noted. Include in-wall blocking requirements.
- B. Product Data: Submit list and complete descriptive data of all products proposed for use. Include manufacturer's specifications and installation instructions.

1.6 INFORMATIONAL SUBMITTALS

- A. Statement that all extinguishers and cabinets comply with the current applicable UL and NFPA classifications and ratings.
- B. Sample of manufacturer's warranty.

1.7 CLOSEOUT SUBMITTALS

- A. Written instructions to Owner's personnel in the operation, maintenance and charging of the fire extinguishers furnished.

FIRE EXTINGUISHERS AND CABINETS
SECTION 10 4416
3595001

- B. Warranty/Guarantee: Submit executed warranty and subcontractor's guarantee.

1.8 QUALITY ASSURANCE

- A. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.
- B. Single-Source Responsibility: Use materials and products of one manufacturer.
- C. Materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.
- D. Equipment shall be approved by Underwriters' Laboratories, Inc., bear UL Label and be approved by the State Fire Marshal.

1.9 DELIVERY, STORAGE AND HANDLING

- A. Deliver undamaged products to job in manufacturer's sealed containers and/or original bundles with tags and labels intact.
- B. Store materials in protected, dry conditions off of ground and in areas so as to not interfere with the progress of the work.
- C. Transport, store and handle in strict accord with the manufacturer's written recommendations.

1.10 FIELD MEASUREMENTS

- A. Make and be responsible for all field dimensions necessary for proper fitting and completion of work. Report discrepancies to Architect before proceeding.

1.11 WARRANTY

- A. Manufacturer: In addition to the Contractor's and Subcontractor's Standard Guarantee, furnish Owner with manufacturer's fully executed written warranty for fire extinguishers against defects in materials and workmanship for a period of not less than 5 years.

PART 2 - PRODUCTS

2.1 DESIGN AND PERFORMANCE CRITERIA

- A. Conform to all applicable standards of the National Fire Protection Association (NFPA) and California State Fire Marshal (CSFM) for fire extinguisher cabinets and locations.

2.2 FIRE EXTINGUISHERS

- A. Manufacturer: By same manufacturer as fire extinguisher cabinets.
- B. Types:

FIRE EXTINGUISHERS AND CABINETS
SECTION 10 4416
3595001

1. Fire extinguishers - General Use: UL Rating 3A-40BC extinguishers shall be 5-pound nominal capacity multi-purpose dry chemical type, bearing U.L. Label; finish shall be red enameled steel.
- C. Tamperseals on each extinguisher shall be of the breakable metal type, indicating accidental or unauthorized partial discharge.
- D. Pressure gauges on each extinguisher shall be of the dial type.
- E. Mounting Brackets:
 1. Manufacturer: Provide brackets from same manufacturer as fire extinguisher.
 2. Brackets shall be of quick release design, not subject to release by bumping.
 3. Bracket attachments shall be furnished with each bracket, suitable for the surface to which attachment is to be made.

2.3 FIRE EXTINGUISHER CABINETS

- A. General:
 1. Size cabinets to conform to size and number of extinguishers at each location shown on the Drawings.
- B. Manufacturer and Product: "Cosmopolitan" Series by JL Industries, Inc., a division of the Activar Construction Products Group as specified, or equal.
 1. Mounting:
 - a. Type 1: Semi-recessed with 2-1/2 inch return trim, rolled edge, for 3A-40BC fire extinguisher.
 - b. Type 3: Fully-recessed with 3/8 inch flat trim, depth as required.
 2. Door Style: S21 solid with black ABS flush (recessed) pull and continuous hinge.
 3. Latching Device: Manufacturer's standard roller catch.
 4. Finishes:
 - a. Door and Trim: Stainless steel, #4 satin finish.
 - b. Cabinet Box (Tub): Manufacturer's standard white electrostatic powder coat.
 5. Provide mounting clips, suitable for extinguishers being provided, in each cabinet.
 6. Identification: "FIRE EXTINGUISHER" in vertical red color lettering.
 7. Cabinet shall be fabricated to meet ADA and CBC projection criteria.
 8. Welded anchors to be provided appropriate to construction in which cabinet is placed.
 9. Cabinets located in fire rated walls to be "Cosmopolitan Fire FX" Option.

FIRE EXTINGUISHERS AND CABINETS
SECTION 10 4416
3595001

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Prior to installation of work of this Section, carefully inspect and verify that the installed work of all other trades is complete to the point where this installation may properly commence.
- B. Verify that specified items may be installed in accordance with the approved design.
- C. In the event of discrepancy, immediately notify Architect. Do not proceed in discrepant areas until discrepancies have been fully resolved.

3.2 PROTECTION

- A. Protect work and materials of this Section and other Sections prior to and during installation, and protect the installed work and materials of other trades.
- B. In the event of damage, immediately make all repairs and replacements necessary to the approval of the Architect and at no additional cost to the Owner.

3.3 INSTALLATION

- A. Install cabinets and extinguishers where indicated on the Drawings and as required by the local Fire Authority. Where exact location of cabinets is not indicated, locate as directed by Architect.
- B. Install cabinets in accordance with manufacturer's instructions and approved shop drawings.
- C. Install so that handle of extinguisher meets accessibility requirements.
- D. Prepare recesses in walls for cabinets as required by type and size of cabinet and style of trim and to comply with manufacturer's instructions. Provide blocking, backing and other materials necessary for proper attachment and fire rating.
- E. Anchor cabinets and brackets securely in place.
- F. Provide fire extinguisher in each fire extinguisher cabinet.

3.4 INSTALLATION OF FIRE EXTINGUISHERS

- A. Determine approximate completion date of work and then inspect, charge, and tag fire extinguishers not more than 10 calendar days before nor less than one day before actual completion of work.
- B. The installation of the specified fire extinguishers in no way relieves the Contractor from providing adequate fire protection during the course of this work.

FIRE EXTINGUISHERS AND CABINETS
SECTION 10 4416
3595001

END OF SECTION

*p:\sacramento\3595 tracy unified school district\001-000_villalovo es new shade structures\08 specifications\06 spec\04
final\freiler\10 4416_fire extinguishers and cabinets.docx
Last Updated: September 24, 2021*

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Manual-operated horizontal louver blinds.

1.2 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CAL Green), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- C. National Fire Protection Association (NFPA):
 - 1. 701: Standard Methods of Fire Tests for Flame Propagation of Textiles and Films.
- D. California Administrative Code:
 - 1. Title 19: Public Safety.

1.3 ADMINISTRATIVE REQUIREMENTS

- A. Submittal Procedures:
 - 1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
 - 2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Contract Closeout and Final Cleaning.

1.4 ACTION SUBMITTALS

- A. Shop Drawings: Submit showing parts, connections and anchorages, adjacent materials, fully dimensioned and noted.
- B. Product Data: Submit list and complete descriptive data of products proposed for use. Include Manufacturer's specifications, published warranty or guarantee, installation instructions, and maintenance instructions.
- C. Samples: The following samples are required.
 - 1. Manufacturer's full range of colors for Architect's selection.

1.5 INFORMATIONAL SUBMITTALS

- A. Sample of manufacturer's warranty.

HORIZONTAL LOUVER BLINDS
SECTION 12 2113
3595001

1.6 CLOSEOUT SUBMITTALS

- A. Warranty/Guarantee: Submit executed warranty and Subcontractor's guarantee.

1.7 QUALITY ASSURANCE

- A. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.
- B. Use materials and products of one Manufacturer whenever possible.
- C. Materials, components, assemblies, workmanship and installation are to be observed by the Owner's Inspector of Record. Work not so inspected is subject to uncovering and replacement.
- D. Flame-resistant materials shall pass or exceed one of more of the following:
 - 1. National Fire Protection Association (NFPA) 701.
 - 2. California Administrative Code Title 19.

1.8 DELIVERY, STORAGE AND HANDLING

- A. Deliver undamaged products to job in Manufacturer's sealed containers and/or original bundles with tags and labels intact.
- B. Store materials in protected, dry conditions off of ground and in areas so as to not interfere with the progress of the Work.
- C. Transport, store and handle in strict accord with the manufacturer's written recommendations.

1.9 FIELD CONDITIONS

- A. Verify field measurements for openings to receive vertical blinds allowing proper clearances as recommended by Manufacturer to allow free rotation and traversing.
- B. Prior to shade installation, building shall be enclosed.
- C. Interior temperature shall be maintained between 60 degrees F and 90 degrees F during and after installation; relative humidity shall not exceed 80 percent. Wet work shall be complete and dry.

1.10 WARRANTY

- A. Manufacturer: In addition to the Contractor's and Subcontractor's Guarantee, furnish Owner with manufacturer's fully executed written limited lifetime warranty for the repair or replacement of horizontal louver blinds against defects in materials and workmanship.

PART 2 - PRODUCTS

2.1 PRODUCTS

- A. Model "CD80 1 Mini Aluminum Blind" as manufactured by Hunter Douglas Contract, or equal.

2.2 MATERIALS

- A. Slats: Aluminum alloy, 1 inch wide by .008 inch thick, heat-treated and spring tempered aluminum alloy 6011, with eased corners and manufacturing burrs removed. Furnish not less than nominal 15.2 slats per foot to ensure tight closure and light control.
- B. Slat Support: Braided ladders of 100 percent polyester yarn color compatible with slats and spacing of ladder no more than 20mm, reinforced to withstand 100 pound pull. Distance between ladders not to exceed Manufacturer's requirements.
- C. Headrail: U-shaped profile with rolled edges, measuring 1-3/8 inches x 1-3/8 inches x 0.024 inch constructed of corrosion-resistant steel, providing a beveled edge valance-free design. Ends to be fitted with 0.024 inch steel end lock with adjustable tab for centering blinds. Finish to be standard baked-on polyester and to match slats.
- D. Bottom Rail: Steel with corrosion-resistant finish formed with double-lock seam into closed oval shape for optimum beam and torsional strength. Ends fitted with color-coordinated engineered polymer caps. Finish to be standard baked-on polyester and to match slats.
- E. Lifting Mechanism: Crashproof steel cordlocks with corrosion-resistant finish, two-ply polyester cord filler in braided polyester jacket lift cords, cord equalizers, cordlock adapter, and cord stop / single pull cord. Install within 2022 CBC reach ranges 11B-308.
- F. Tilting Mechanism: Permanently lubricated die-cast worm and gear type tilter gear mechanism in fully enclosed housing with clutch action to protect ladder tapes from over rotation of the solid steel, corrosion resistant tilt rod.
- G. Tilt Control Wand: Tubular shaped 7/16 inch diameter extruded clear plastic, ribbed for positive grip and detachable without tools.
- H. Mounting Hardware: Manufacturer's standard as required for the type of installation shown.
- I. Hold-Down Brackets: Provide metal hold down brackets where blinds are to be mounted on doors.

2.3 FINISHES

- A. Aluminum: Manufacturer's standard baked-on finish in colors selected by Architect from manufacturer's available contract colors utilizing "Dust Shield" finish to inhibit dust build-up for easier maintenance.
- B. Cord and braided ladders shall be color coordinated with slat.

HORIZONTAL LOUVER BLINDS
SECTION 12 2113
3595001

2.4 FABRICATION

- A. Blind measurements shall be accurate to within plus or minus 1/8 inch or as recommended in writing by the manufacturer for the specific installation conditions.
- B. Hardware shall be enclosed in a metal head. Operating hardware shall be machine clinched to head to assure perfect alignment. Slats shall tilt to any angle by turning a transparent wand. Blinds shall fit within the window openings as detailed, unless otherwise indicated.
- C. Other materials and components not specifically described, but required for a complete and proper installation of horizontal window blinds, shall be selected by the Installer, subject to approval of the Architect. Do not intermix component parts of various manufacturers in assembled units.
- D. Prior to fabrication, verify cords and tilt devices will be accessible and operational from the floor and will not conflict with cabinets, doors, fixtures or other items. Locate on either end as directed or approved. Bring potential conflicts to Architect's attention for resolution prior to start of Work.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Prior to installation, carefully inspect and verify that the installed Work of other trades is complete to the point where this installation may properly commence.
- B. Verify that specified items may be installed in accordance with approved design.
- C. In the event of discrepancy, immediately notify the Architect. Do not proceed in discrepant areas until discrepancies have been fully resolved.

3.2 INSTALLATION

- A. Install horizontal window blinds level and true, in accordance with the Drawings and the manufacturer's recommended procedures.
- B. Blinds shall be installed inside mount, unless otherwise indicated. Consult with Architect where inside mount may not be possible.
- C. Provide 1-1/2 inch overlap at each jamb where face installations are indicated or approved.
- D. Divisions between blinds, where required, shall occur only at mullions.
- E. Install intermediate support brackets and extension brackets as needed to prevent deflection in headrail.

3.3 CLEANING AND ADJUSTING

- A. Test operation of horizontal window blind hardware before and after installation. Operation shall be smooth and uniform.
- B. Upon completion of installation, remove manufacturer's temporary labels, marks of identification. Thoroughly wash surfaces and remove foreign material. Leave entire Work in neat, orderly, clean and acceptable condition as approved. Replace damaged parts and surfaces which are not free from imperfections.
- C. Finish installation free of dirt and finger marks. Leave work area clean and free of debris.

3.4 PROTECTION

- A. Protect Work and materials of this Section prior to and during installation, and protect the installed Work and materials of other trades.
- B. In the event of damage, make repairs and replacements necessary to the approval of the Architect at no additional cost to the Owner.
- C. Exposed finishes shall be free from scratches, dents, permanent discolorations and other defects in workmanship or material.

END OF SECTION

*p:\sacramento\3595 tracy unified school district\001-000_villalovoz es new shade structures\08 specifications\06 spec\04
final\freiler\12 2113_horizontal louver blinds.docx
Last Updated: April 2, 2021*

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Manufactured, plastic-laminate-faced, modular casework and accessory items.

1.2 RELATED REQUIREMENTS

- A. Section 01 6116, Volatile Organic Compound (VOC) Content Restrictions, for VOC limits pertaining to adhesives, sealants, fillers, primers, and coatings.
- B. Section 01 8113, Sustainable Design Requirements, for CAL-Green general
- ~~C. Section 06 4023, Interior Architectural Woodwork.~~
- ~~D. Section 09 2900, Gypsum Board.~~
- E. Section 09 9100, Painting.
- F. Section 12 3623, Plastic-Laminate-Clad Countertops.
- G. Division 26, Electrical, for electrical outlets and fittings built into architectural casework.

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as note on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CALGreen), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- C. American National Standards Institute (ANSI):
 - 1. ANSI A208.2: Medium Density Fiberboard for Interior Use.
 - 2. ANSI/BHMA A156.9: American National Standard for Cabinet Hardware; Builders Hardware Manufacturers Association.
 - 3. ANSI/BHMA A156.18: American National Standard for Materials and Finishes; Builders Hardware Manufacturers Association.
- D. National Electrical Manufacturers Association (NEMA):
 - 1. NEMA LD3.1: "High-Pressure Decorative Laminates."
- E. Woodwork Institute (WI)/ Architectural Woodwork Manufacturers of Canada (AWMAC):
 - 1. North American Architectural Woodwork Standards (NAAWS).

MANUFACTURED PLASTIC-LAMINATE-CLAD CASEWORK
SECTION 12 3216
3595001

1.4 DEFINITIONS

- A. General: The following definitions are in conformance with those included in the referenced NAAWS document.
- B. "Exposed Exterior" surfaces include all surfaces visible when doors and drawers are closed.
 - 1. Bottoms of casework more than 4 feet above the floor will be considered an exposed surface.
 - 2. Tops of casework that are visible by building occupants from stairs, mezzanines or other elevated locations will be considered as exposed.
- C. "Exposed Interior Surfaces" surfaces exposed to view in open casework or behind glass doors.
- D. "Semi-Exposed Surfaces" are interior surfaces only exposed to view when doors or drawers are open.
- E. "Concealed Surfaces" include surfaces of sleepers, web frames, dust panels, and other surfaces that are not visible after installation.

1.5 ADMINISTRATIVE REQUIREMENTS

- A. Submittal Procedures:
 - 1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
 - 2. Sustainable Design Submittals shall comply with the additional requirement of Section 01 8113, Sustainable Design Requirements.
 - 3. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
- B. Scheduling and Coordination:
 - 1. Require casework fabricator to examine the schedule and check it for timing, accuracy and compatibility with its work and shall coordinate work with the master schedule and job superintendent.
 - 2. Require casework fabricator to furnish assistance in coordination and scheduling of other work pertinent to casework installation and to notify Contractor of requirements so as to result in a well-coordinated job.

1.6 ACTION SUBMITTALS

- A. Shop Drawings:
 - 1. Submit dimensioned plans, elevations, component profiles, and details for each casework layout showing the following:
 - a. Locations and type of service fixtures with lines thereto; anchorage locations, installation details to floors and walls.

MANUFACTURED PLASTIC-LAMINATE-CLAD CASEWORK
SECTION 12 3216
3595001

- b. Relationship of units in to surrounding and adjacent construction including walls, doors, and windows.
 - c. Swing of doors.
 - d. Shelving.
 - e. Accessory items such as fillers, end panels, and valance.
 - f. Base height.
 - 2. First page of shop drawings and each elevation shall bear an individually serial-numbered WI "Certified Compliance Label."
- B. Product Data:
- 1. Provide manufacturers cut sheets for all materials proposed for use including:
 - a. Panel products.
 - b. Cabinet hardware items.
 - c. Laminates.
 - 2. Include manufacturer's literature for items which are proposed for use and specified herein only by listing the intended performance requirements.
- C. Samples: The following samples are required.
- 1. Each type of high pressure laminate (HPL), edge banding, cabinet liner, and melamine-faced panel.
 - a. Plastic laminate and edge banding to be selected from manufacturers' full range of colors by Architect.
 - 2. Hardware: Adjustable shelf clip, hinge, pull, magnetic catch, elbow catch and lockset. Returned hardware samples may be used on the project unless otherwise noted by the Architect.

1.7 INFORMATIONAL SUBMITTALS

- A. Before delivery of casework to jobsite, submit a WI "Certified Compliance Certificate" listing the items certified, the applicable NAAWS Grade, and whether installation is included.
- B. Qualification Data: For installer.
- C. Sample of manufacturers' warranty.
- D. Sustainable Design:
 - 1. General:
 - a. Submit information necessary to establish and document compliance with the California Green Building Standards Code.
 - b. Sustainable design submittals are in addition to other submittals.
 - 2. The following information shall be provided:
 - a. Composite Wood: Evidence of compliance that products meet formaldehyde limits of current CARB Airborne Toxic Control Measure (ATCM) as specified in Section 01 6116.

MANUFACTURED PLASTIC-LAMINATE-CLAD CASEWORK
SECTION 12 3216
3595001

- b. Adhesives and Sealants: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.

1.8 CLOSEOUT SUBMITTALS

- A. Warranty: Submit executed warranty.
- B. **[Specified maintenance materials]**

1.9 MAINTENANCE MATERIAL SUBMITTALS

- A. Provide additional materials as follows:
 - 1. Hinges: 10 each.
 - 2. Pulls: 10 each.
 - 3. Cabinet Locks: 10 each.
 - 4. Adjustable Shelf Supports: 25 each.
- B. Deliver to Owner as directed.

1.10 QUALITY ASSURANCE

- A. General:
 - 1. Furnish all components and accessories and all allied products new and free from defects.
 - 2. To assure proper coordination and eliminate divided responsibility, all work specified in this Section shall be executed under the direction of a single manufacturer and supplier.
- B. Qualifications:
 - 1. Manufacturer: The casework manufacturer must have not less than 5 years of production experience similar to this project, and the specified product, and whose qualifications indicate the ability to comply with the requirements of this section.
 - 2. Installer: The installer must have at least one project in the past 5 years with similar systems and complexities to those required for this project, and where the value of the woodwork is a minimum of 80% of the cost of woodwork for this project.
- C. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.
- D. Single-Source Responsibility: Use materials and products of one manufacturer whenever possible.
- E. Materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.
- F. Casework Designations:

MANUFACTURED PLASTIC-LAMINATE-CLAD CASEWORK
SECTION 12 3216
3595001

1. Reference numbers on Drawings are related to NAAWS Cabinet Design Series (CDS) Elevation numbers, and are used to identify prefinished casework and to indicate dimensions, general design, equipment, shelving (adjustable and fixed) and other components to be furnished. Unless modified by notation on Drawings, description for indicated number shall constitute requirements for such cabinets incorporating all features set forth in the NAAWS CDS Elevations.
 2. Use of the NAAWS CDS Elevations numbers, and specific requirements set forth on the Drawings and as specified, are not intended to preclude use of other manufacturer's product or procedure, which may be equal thereto, but are given to establish standard of design and quality of materials, construction and workmanship.
- G. Proof of compliance with the specified NAAWS Grade assembly and installation shall be provided by the following WI Quality Control Program:
1. WI Monitored Compliance Program.
 - a. All casework and the installation thereof for this project shall be directly monitored for compliance to the Contract by the Woodwork Institute under the scope of their Monitored Compliance Program (MCP).
 - 1) Inspections are to be performed at the beginning of fabrication, at the time of delivery to the job, at the beginning of installation, at completion of installation.
 - 2) Further information on the WI Monitored Compliance Program's Policies and Procedures are available directly from the Woodwork Institute, 916-372-9943.
 - 3) The WI MCP Registration Number shall be referenced in all communication.
 - b. Fees charged by the Woodwork Institute for their monitored compliance service are the responsibility of the Contractor and shall be included in the Contract sum.
 - c. Casework and/or installation determined to be non-compliant by WI and not corrected will be rejected.
 - d. Issuance of the WI Monitored Compliance Certificate is a prerequisite of the Owner's final acceptance.
- H. Mockups: Provide mockup of one base cabinet and one wall hung cabinet to verify finish material selections, modifications made under sample submittals, and to demonstrate aesthetic effects and set quality standards for materials and execution for cabinet exteriors, interior construction, and hardware.
1. The base cabinet is to have at least one drawer and be of the same material to be provided for the project.
 2. The approved mockup may be incorporated in the project.
- 1.11 DELIVERY, STORAGE AND HANDLING**
- A. Deliver undamaged products to job in manufacturer's sealed containers and/or original bundles with tags and labels intact.

MANUFACTURED PLASTIC-LAMINATE-CLAD CASEWORK

SECTION 12 3216

3595001

- B. Store materials in protected, dry conditions off of ground and in areas so as to not interfere with the progress of the work.
- C. Transport, store and handle in strict accordance with the manufacturer's recommendations.
- D. Do not deliver until wet operations in building are completed and storage area is closed in and broom clean, with relative humidity 50 percent or less at 70 degrees F.
- E. Deliver in sections to fit through openings.

1.12 FIELD CONDITIONS

- A. Environmental Limitations: Do not deliver or install casework until building is enclosed, wet-work is complete, and HVAC system is operating and maintaining temperature and relative humidity at levels planned for building occupants during the remainder of the construction period.
- B. Products shall be available at project when required for installation so as not to delay job progress. Installer for these products shall cooperate with installers performing work under other sections involved to effect proper installation.
- C. Casework fabricator shall coordinate installation of any Owner supplied equipment where indicated on the Drawings.
- D. Field Measurements: Make and be responsible for all field dimensions necessary for proper fitting and completion of work. Report discrepancies to Architect before proceeding.

1.13 WARRANTY

- A. Manufacturer: In addition to the Contractor's Standard Guarantee, furnish Owner with manufacturer's fully executed written 5-year warranty for casework against defects in materials and workmanship. Warranty shall include against delaminations, joint separations, warp or twist in doors more than 1/4 inch, and splits or cracks in finished surfaces.

PART 2 - PRODUCTS

2.1 DESIGN AND PERFORMANCE CRITERIA

- A. Sustainable Design:
 - 1. Composite wood products must meet current formaldehyde emission limits of CARB Airborne Toxic Control Measure (ATCM) as specified in Section 01 6116.
 - 2. VOC emissions for field-applied adhesives, sealants, and sealant primers must comply with limits specified in Section 01 6116.

2.2 PANEL MATERIALS

- A. Medium-Density Fiberboard (MDF): ANSI A208.2, Grade 155, formaldehyde-free, and meeting grade MR30 moisture resistance; "Medite II," by Roseburg, or equal.
 - 1. Thickness: 3/4 inch, unless otherwise shown or specified.
- B. Thermally-Fused Melamine Panels (TFM): Melamine resin-impregnated decorative paper thermally fused to a formaldehyde free MDF core.
 - 1. Color: White, unless otherwise noted or selected by Architect from a minimum of 6 colors.
- C. Plywood: Exterior type, Grade B-C or better. Plywood to be free of urea-formaldehyde.
- D. Hardboard: Tempered Grade, conforming to standards of American Hardboard Association or PS-50; use smooth side exposed.
- E. Particle Board: Not permitted.

2.3 LAMINATE MATERIALS

- A. High-Pressure Plastic Laminate: Conforming to NEMA LD3.1 and ISO 4586-2.
 - 1. Grades:
 - a. Horizontal Surfaces: ISO 10/HGS; horizontal, general purpose, standard.
 - b. Vertical Surfaces: ISO 20/VG; vertical, general purpose.
 - c. Cabinet Liner (If Specified TFM Panel is Not Used): ISO 72/CLS, cabinet liner, standard.
 - d. Backing Sheet: ISO 91/BKL; backer, light duty.
 - 2. Manufacturers: Formica, Wilsonart, Arborite, Pionite, Nevamar, or equal.
 - 3. Colors, and Patterns:
 - a. Exposed: As selected by Architect from manufacturer/suppliers' full product color range.
 - 1) There will be no additional cost allowance for premium color selections, or for selection of different colors for different rooms up to a maximum 6 colors.
 - 2) Doors and frames may be different selections.
 - b. Cabinet Liner: White.

2.4 ADDITIONAL MATERIALS

- A. Edge Bandings:
 - 1. 3-mm thick PVC: Solid, high impact, purified, color-thru, acid resistant, pre-laminated primed edging, machine-applied with hot melt adhesives, automatically trimmed, inside/outside length-radiused for uniform appearance, buffed and corner-radiused for consistent design.
 - a. Locations: Door and drawer face edge, and exposed shelf edge.

MANUFACTURED PLASTIC-LAMINATE-CLAD CASEWORK

SECTION 12 3216

3595001

- b. Color: As selected by Architect from manufacturer's full range of standard colors.
- 2. 0.02-inch thick PVC: Flat Edge, solid, high impact, purified, color-thru, acid resistant PVC, edging machine-applied with hot melt adhesives, automatically trimmed face, back and corners for uniform appearance.
 - a. Locations:
 - 1) Drawer body edge, not drawer face, and cabinet body edge including door and drawer front spacer rail.
 - 2) Interior body component edging, interior dividers and interior shelving.
 - b. Color: Match cabinet interior surface color.

2.5 HARDWARE

- A. Comply with requirements of BHMA A156.9, Type 2 (Institutional).
- B. Finishes:
 - 1. Exposed Items: Satin chromium plated, 626, unless otherwise noted complying with ANSI/BHMA A156.18.
 - 2. Concealed Items: Manufacturer's standard finish, complying with applicable product class of ANSI/BHMA A156.9.
- C. Hinges:
 - 1. Type: Heavy duty, five knuckle, 2-3/4-inch, institutional type hinge; let into door to achieve 1/8 inch reveals; Part Number 374 by Rockford Process Control, or equal, unless otherwise recommended by fabricator for total door and side panel thickness after application of laminate finish.
 - a. Hinges shall be mill ground, hospital tip, tight pin feature with all edges eased.
 - b. Hinges to be full wrap around type of tempered steel 0.095 inch thick.
 - c. Hinges shall accommodate 3/4 inch thick laminated door and allow 270 degree swing.
 - 2. Fasteners: Each hinge to have minimum 9 screws, #7, 5/8 inch FHMS to assure positive door attachment. Fill all holes if greater than 9.
 - 3. Quantity:
 - a. One pair per door to 48 inches in height.
 - b. One and one-half pair 48 inches in height to 84 inches in height.
 - c. Over 84 inches in height, provide 2 pair of hinges.
- D. Door and Drawer Pulls: Hafele, Catalog No. 110.08.400, or equal.
- E. Magnetic Catches: Häfele 246 with matching strike plate, matt nickel finish, or equal.
- F. Locks: CompX National Lock C8100 Series pin tumbler, or equal.
 - 1. All cabinets in each Room to be keyed alike.
 - 2. All Rooms to be keyed different.

MANUFACTURED PLASTIC-LAMINATE-CLAD CASEWORK
SECTION 12 3216
3595001

- 3. Locations: As indicated on the Drawings.
- G. Locks: Schlage CL2000 Series cabinet and drawer locks with solid brass 6 pin cylinders.
 - 1. Locks in rooms keyed alike; rooms keyed differently.
- H. Surface Bolt for Locked Pair Doors: Elbow Catch: #2 Elbow Catch by Ives, or equal.
 - 1. Finish: Satin chrome.
 - 2. Locate and mount surface bolt on door far enough below shelf to allow for 1/2-inch deflection of shelf and also to allow for proper engagement of surface bolt and angle strike.
- I. Drawer Guides: Accuride as specified, or equal:
 - 1. Drawers Less Than 24 inches Wide: Light duty, full extension; Model 3732.
 - a. Provide appropriate length.
 - b. Load Rating per Pair: 100-pounds.
 - 2. Drawers 24 inches to 36 Inches Wide: Medium duty with 1-inch over travel; Model 3301.
 - a. Provide appropriate length.
 - b. Load Rating per Pair: 150-pounds.
 - 3. Drawers 36-inches to 42-inches Wide: Heavy-duty with 1-inch over travel; Model 3634.
 - a. Provide appropriate length.
 - b. Load Rating per Pair: 200-pounds.
 - 4. Drawers 42-inches to 48-inches Wide: Heavy duty with 1-inch over travel; Model SS5321.
 - a. Provide appropriate length.
 - b. Load Rating per Pair: 350-pounds.
- J. Adjustable Shelf Supports: Seismic restraining type; "Universal 1" by Hettich International for insertion into 5 mm holes, or equal.

2.6 ADDITIONAL MATERIALS

- A. Bumper Pads (Silencers): Hemispherical, quiet clear type, 55 Shore A hardness; 3M Bumpon Protective Products, or equal.
- B. Adhesive: As recommended by panel manufacturer best suited for the intended use and that has a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
- C. Glue: Aliphatic-resin, polyurethane, or resorcinol wood glue recommended by manufacturer for general carpentry use that has a VOC content of 30 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
- D. Fasteners: Size and type to suit application in accordance with specified standards and as required.

MANUFACTURED PLASTIC-LAMINATE-CLAD CASEWORK
SECTION 12 3216
3595001

2.7 FABRICATION - GENERAL

- A. Construction shall conform to NAAWS casework requirements.
- B. Make job measurements as required for proper fabrication of the work.
- C. Grade: Custom. If provisions for the NAAWS Grade are in conflict with, or modified by the drawings and/or specifications, the modifications shall govern.
- D. Door and Drawer Front Style: Flush overlay, NAAWS Style A.
- E. Carcass Construction: Type A frameless. Provide as single unit at open shelving to greatest extent possible.

2.8 FABRICATION OF CABINET COMPONENTS

- A. Cabinet Bodies:
 - 1. Fabricate, assemble and finish each cabinet as complete, self-supporting unit.
 - a. Unless otherwise shown, counter height and tall storage units shall be 24 inches minimum overall depth; wall-hung units shall be 15 inches minimum overall depth.
 - b. At concealed locations, provide tops on all wall-hung and tall cabinets utilizing melamine on both faces.
 - c. At locations where the tops of wall hung or tall cabinets are visible, provide tops on all wall-hung and tall cabinets utilizing HPL on exterior face and melamine on interior face.
 - d. Fabricate bottoms, tops and frames of lock-joint glued and screwed, or dowelled and glued construction to end panel construction. Simple butted not permitted.
 - e. Tops and sides of tall units and wall-hung cabinets shall be 3/4-inch thick MDF core.
 - f. Bottoms of upper cabinets shall be constructed of same materials as specified for shelving.
 - g. Tall cabinets and base cabinets, fronts and sides shall be 3/4-inch thick MDF core.
 - h. Cabinet backs shall be a minimum of 1/4-inch thick.
 - i. Dowel and screw partitions and boxed shelves into top framing, bottoms or ends, as applicable.
 - j. Middle shelf of tall cabinets, 5 feet or greater in height, shall be fixed.
 - k. At top of counter height units, provide 3/4-inch plywood boxed subframe, mortised and tenonned, glued and screwed, for concealed attachment of countertop and for cabinet rigidity.
 - l. Provide toe space on floor-mounted units.
 - m. For tall units and wall-mounted cabinets, include 5/8 inch x 3 inch concealed wood strips full length at top and bottom, for screw or bolt anchorage to wall to conform to pull requirements of Title 24.
 - n. Holes for Shelf Support Clips: 32mm on center.

MANUFACTURED PLASTIC-LAMINATE-CLAD CASEWORK
SECTION 12 3216
3595001

- 1) Provide 2 holes on each side of shelf except provide a 3rd hole where cabinets are deeper than 24 inches.
 - 2) Locations shall be confirmed with Architect.
 - o. The fabrication of casework must allow for shim space at the base of the cabinets, to account for field conditions, as required so that the height from finish floor to top of counter, and sink rim where occurs, does not exceed the specified height at any location along the countertop after installation.
 - 2. Finishing:
 - a. Exposed Interior Surfaces and Semi-Exposed Surfaces:
 - 1) Melamine bonded to MDF core; specified TFM panel.
 - 2) Use for all semi-exposed surfaces, tops and bottoms of wall-hung and tall cabinets except as otherwise specified, concealed ends, partitions, and drawer boxes.
 - 3) See "Shelves" Paragraph for panel and finish requirements for shelving.
- B. Drawers:
- 1. Fabrication:
 - a. Fabricate and assemble drawer boxes with subfront and back glued and screwed into tenons at drawer sides.
 - b. Fronts shall be 3/4 inch thick MDF.
 - c. Sides: 1/2 inch thick MDF to create drawer box subfront, sides, back and bottom.
 - d. Extend bottom into dados with glue and screws at all 4 edges, using 1/4-inch materials matching the sides and backs.
 - e. At drawers over 30 inches wide, provide 1/2-inch bottoms.
 - f. Install 2-drawer guides for each drawer with positive closing and stop device to prevent inadvertent removal.
 - g. Drawer boxes to be full height of drawer opening.
 - h. Attach drawer front to subfront with #8 x 1-inch pan head wood screws (P.H.W.S.)
 - i. Provide closing stops at the rear of both drawer sides, unless stops are built into the slides to prevent the drawer front from impacting the cabinet body.
 - 2. Finishing:
 - a. Drawer Front: Vertical grade high-pressure laminate (HPL).
 - b. Interior Face of Drawer Front: Cabinet liner.
 - c. Band all 4 edges of drawer front with specified banding material.
 - d. Provide TFM panel with melamine finish on both faces, for subfront, sides, back and bottom.
- C. Doors:
- 1. Fabrication:
 - a. Panel: 3/4-inch thick MDF.

MANUFACTURED PLASTIC-LAMINATE-CLAD CASEWORK
SECTION 12 3216
3595001

- b. Hang face-mounted over cabinet, pairs parallel with proper clearance at pull edges. Install hardware.
 - c. Clearance Tolerances: Develop 1/8 inch maximum reveals.
 - 2. Finishing:
 - a. Exposed Exterior Face: Specified HPL.
 - 1) Where wood grain pattern is selected, provide pairs of doors with book-match wood grain patterns.
 - b. Exposed Interior Face: Cabinet liner.
 - c. Band all 4 edges of doors with specified banding material.
- D. Shelves:
 - 1. Fabrication - General:
 - a. Shelving to be adjustable on 1-1/4 inch centers supported by 4 adjustable shelf clips.
 - b. Loading capacity to be minimum 50 pounds per square foot, not to exceed 200 pounds on any shelf.
 - c. Shelving shall match the interior depth of the cabinet box.
 - d. Band all leading edges with edge banding material as specified.
 - 2. Shelving less than 24 inches: 3/4-inch MDF.
 - a. Finish: Melamine, both sides.
 - 3. Shelving 24 to 30 inches: 1-inch MDF.
 - a. Finish: Melamine, both sides.
 - 4. Shelving Greater than 30 inches, up to 36 inches: 1-inch, MDF.
 - a. Finish: Vertical grade HPL, both sides, applied with rigid glue line process.
 - 5. Shelving Greater than 36 inches, up to 48 inches: 1-inch plywood.
 - a. Finish: Vertical grade HPL, both sides, applied with rigid glue line process. Contact adhesive is not permitted.
- E. Scribes and Filler Panels:
 - 1. Provide matching scribes and filler panels, and scribe all cabinets to abutting walls, partitions and ceilings.
 - 2. Scribes shall not exceed 1-1/2 inches wide.
 - 3. Scribe to be covered top and bottom.
 - 4. At locations where casework wraps inside corners, provide top and bottom filler panels where voids occur.
- F. Cabinet Bases:
 - 1. If casework manufacturer chooses to use cabinet bases, they shall be 4 inches standard height.
 - 2. Fabricate completely out of 3/4-inch plywood in continuous lengths to insure straight and level installation of cabinet bodies. MDF is not acceptable for use at bases.

3. Freestanding cabinets shall have cabinet ends running directly to the floor.
4. Anchorage fasteners to be neatly installed through the back and anchor strip at the top and bottom, and middle at tall cabinets.

2.9 COORDINATION WITH APPLIANCES

- A. Contractor shall have casework manufacturer review all locations where appliances are to be installed and coordinate dimensions to ensure the correct size openings are provided.
 1. Shop drawings shall clearly indicate locations and opening dimensions.
 2. Where appliances are not in contract, shop drawings shall request confirmation of critical dimensions.
- B. Adjustments that need to be made to the casework due to appliances not fitting correctly are to be done at no additional cost to the Project.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Prior to installing casework, examine and verify that the installed work of all other trades is complete to the point where this work may properly commence.
- B. Verify that specified items may be installed in accordance with the approved design.
- C. Review in job conditions, installation requirements, and quality of completed substrate for compliance with Architect's expectations related to floor flatness for installation of casework.
- D. In the event of discrepancy, immediately notify the Architect. Do not proceed in discrepant areas until discrepancies have been fully resolved.

3.2 PREPARATION

- A. Take all necessary measurements in the field to ensure proper dimensions for cabinets prior to fabrication.
- B. Coordinate with other trades whose work adjoins, combines, or aligns with casework.
- C. Where substrate is not in compliance with Architect's expectations related to floor flatness for installation of casework, and where excessive shimming to meet these expectations would be required, level substrate using latex-modified, portland cement based or blended hydraulic-cement-based formulation as specified in Section 03 5416, Hydraulic Cement Underlayment.

3.3 INSTALLATION

- A. Install all work in conformance with the referenced NAAWS document.

MANUFACTURED PLASTIC-LAMINATE-CLAD CASEWORK
SECTION 12 3216
3595001

- B. Supervision: Installation work shall be under direct supervision of representative of manufacturer of the casework.
- C. Set work level, square and in true alignment. Cabinetwork shall fit to walls and upon completion of installation shall show no marks, indentations or other defects. Furnish scribes, filler panels, trim and molding required for finished installation. When set, each individual cabinet shall be capable of withstanding, without movement, a force of 200 pounds applied in any direction.
- D. Cabinet work shall be installed as required so that the height from finish floor to top of counter, and sink rim where occurs, does not exceed the specified height at any location along the countertop after installation.
- E. Method of attachment, including the type, size, frequency and/or spacing of anchoring devices and fasteners shall comply to NAAWS minimum requirements or be as indicated on the Drawings or as specified, whichever is more restrictive.
- F. Doors, drawers and fixtures shall operate correctly and smoothly.
- G. Furnish miscellaneous metal support and bracing required for installation. If necessary, deliver these items to other trades responsible for installation into adjacent work and designate exact location for their installation.
- H. Provide specified seismic restraining, adjustable shelf supports at all adjustable shelves to prevent shelf from sliding out of cabinets with or without doors.

3.4 ADJUSTING AND CLEANING

- A. Prior to final inspection and acceptance by the Architect, completely check each installed item and adjust for proper operation.
- B. Remove all fingerprints, smudges and the like from casework; vacuum clean drawers and interiors of dust, dirt and sawdust.

3.5 PROTECTION

- A. Protect work and materials of this Section prior to and during installation and protect the installed work and materials of other trades. Adjust all moving or operating parts to function smoothly and correctly.
- B. In the event of damage, make all repairs and replacements necessary to the approval of the Architect at no additional cost to the Owner.

END OF SECTION

p:\sacramento\3595 tracy unified school district\001-000_villalovoz es new shade structures\08 specifications\06 spec\04 final\freiler\12 3216_manufactured plastic-laminate-clad casework.docx
Last Updated: November 1, 2021

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Plastic laminate faced counters and splashes.

1.2 RELATED REQUIREMENTS

- A. Section 01 6116, Volatile Organic Compound (VOC) Restrictions, for VOC limits pertaining to adhesives, sealants, fillers, primers, and coatings.
- B. Section 01 8113, Sustainable Design Requirements, for CAL-Green general requirements and procedures.
- ~~C. Section 06 4023, Interior Architectural Woodwork.~~
- D. Section 07 9200, Joint Sealants.
- E. Section 12 3216, Manufactured Plastic-Laminate-Clad Casework; casework to receive countertops.
- F. Division 26, Electrical, for electrical outlets and fittings built into countertops.

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CAL Green), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- C. American National Standards Institute (ANSI):
 - 1. A161.2: Decorative Laminate Countertops, Performance Standards for Fabricated High Pressure.
 - 2. A208.1: Particleboard.
 - 3. A208.2: Medium Density Fiberboard (MDF) for Interior Applications.
- D. International Organization for Standardization (ISO):
 - 1. 4586-2: "High-pressure decorative laminates (HPL, HPDL) - Sheets based on thermosetting resins (usually called laminates) - Part 2: Determination of properties."
- E. Woodwork Institute (WI): North American Architectural Woodwork Standards (NAAWS) published jointly by WI and the Architectural Woodwork Manufacturers of Canada (AWMAC).

PLASTIC-LAMINATE-CLAD COUNTERTOPS
SECTION 12 3623
3595001

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Submittal Procedures:
 - 1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
 - 2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
 - 3. Sustainable Design Submittals shall comply with the additional requirement of Section 01 8113, Sustainable Design Requirements.

1.5 ACTION SUBMITTALS

- A. Shop Drawings: Prepare for each countertop in accordance with Section 1 Article entitled "Submittals" of the referenced NAAWS document.
 - 1. Show items interfacing with countertops including relationship to supporting casework.
 - 2. Identify materials to be used.
 - 3. Shop drawings for countertops may be submitted as part of shop drawings prepared and submitted under Section 12 3216, Manufactured Plastic-Laminate-Clad Casework.
- B. Samples: 8 by 10-inch piece of selected pattern and color of plastic laminate.

1.6 INFORMATIONAL SUBMITTALS

- A. Before delivery of countertops to jobsite, submit a WI "Certified Compliance Certificate" listing the items certified, the applicable NAAWS Grade, and whether installation is included.
- B. Sustainable Design:
 - 1. General:
 - a. Submit information necessary to establish and document compliance with the California Green Building Standards Code.
 - b. Sustainable design submittals are in addition to other submittals.
 - 2. The following information shall be provided:
 - a. Adhesives and Sealants: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.
 - b. Composite Wood: Evidence of compliance that products meet formaldehyde limits of current CARB Airborne Toxic Control Measure (ATCM) as specified in Section 01 6116.
- C. Qualification Data: For fabricator.

1.7 CLOSEOUT SUBMITTALS

- A. Guarantee: Submit extended Contractor guarantee.

1.8 MAINTENANCE MATERIAL SUBMITTALS

- A. Grommets: 5 of each Type.

1.9 QUALITY ASSURANCE

- A. Fabricator Qualifications: Active member of WI. Other fabricators will be considered for approval upon submission of at least 5 years of verifiable evidence of experience in successful completion of work similar to work of this Project. This provision does not waive compliance with specified WI certification.
- B. Standard for Materials and Workmanship:
1. Comply with the applicable requirements of Section 11 - Countertops of the "North American Architectural Woodwork Standards (NAAWS)" published jointly by WI and AWMAC. (hereinafter referred to as "woodworking standard").
 2. Where Contract Documents indicate requirements that conflict with or augment the woodworking standard, comply with the conflicting or augmenting requirements.
- C. Materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.
- D. Proof of compliance with the specified NAAWS Grade assembly and installation shall be provided by the following WI Quality Control Program:
1. WI Monitored Compliance Program.
 - a. All countertops and the installation thereof for this project shall be directly monitored for compliance to the Contract by the Woodwork Institute under the scope of their Monitored Compliance Program (MCP).
 - 1) Inspections are to be performed at the beginning of fabrication, at the time of delivery to the job, at the beginning of installation, at completion of installation.
 - 2) Further information on the WI Monitored Compliance Program's Policies and Procedures are available directly from the Woodwork Institute, 916-372-9943.
 - 3) The WI MCP Registration Number shall be referenced in all communication.
 - b. Fees charged by the Woodwork Institute for their monitored compliance service are the responsibility of the Contractor and shall be included in the Contract sum.
 - c. Countertops and/or installation determined to be non-compliant by WI and not corrected will be rejected.
 - d. Issuance of the WI Monitored Compliance Certificate is a prerequisite of the Owner's final acceptance.

PLASTIC-LAMINATE-CLAD COUNTERTOPS
SECTION 12 3623
3595001

1.10 DELIVERY, STORAGE, AND HANDLING

- A. Do not deliver products until wet work, painting, and similar operations in storage and installation areas that could damage or soil work have been completed.
- B. Protect products during transit, delivery, storage, and handling so as to prevent damage, soiling, and deterioration.
- C. Store countertops only in areas where ambient conditions required can be and are maintained.
- D. Coordinate delivery with fabrication and installation of casework.

1.11 FIELD CONDITIONS

- A. Products shall be available at project when required for installation so as not to delay job progress. Contractor shall have its installer for these products cooperate with installers performing work under other Sections involved to effect proper installation.
- B. Environmental Limitations: Do not deliver or install countertops until building is enclosed, wet-work is complete, and HVAC system is operating and maintaining temperature and relative humidity at levels planned for building occupants during the remainder of the construction period.
- C. Field Measurements: Where countertops are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication and indicate measurements on shop drawings.

1.12 GUARANTEE

- A. Contractor: In addition to its standard Guarantee under the Contract, furnish Owner a special extended written 5-year guarantee, cosigned by installer, agreeing to repair or replace plastic-laminate-clad countertops that fail to perform as required within guarantee period as a result of failure of materials or installation workmanship at no additional cost to the Owner.

PART 2 - PRODUCTS

2.1 DESIGN AND PERFORMANCE CRITERIA

- A. Sustainable Design:
 - 1. VOC emissions for field-applied adhesives, sealants, and sealant primers must comply with limits specified in Section 01 6116.
 - 2. Composite wood products must meet current formaldehyde emission limits of CARB Airborne Toxic Control Measure (ATCM) as specified in Section 01 6116.

2.2 PANEL MATERIALS

- A. Medium-Density Fiberboard (MDF): ANSI A208.2, Grade 155, formaldehyde free. 3/4 inch thick unless otherwise indicated.

1. Typical Locations: Meeting grade MR30 moisture resistance; "Medite II," by Roseburg, or equal.
 2. At Sinks and Adjoining Countertops on Same Wall: Meeting grade MR50 moisture resistance; "Medex," by Roseburg, or equal.
- B. Particleboard: Not permitted.

2.3 LAMINATE MATERIALS

- A. High-Pressure Plastic Laminate: Conforming to ISO 4586-2.
- B. Grades:
1. Horizontal Surfaces and Backsplash: ISO 10/HGS; horizontal, general purpose.
 2. Postforming: ISO 12/HGP; horizontal, general purpose, postformable.
 3. Backing Sheet: ISO 91/BKL; backer, light duty.
- C. Manufacturers: Formica, Wilsonart, Arborite, Pionite, Nevamar, or equal.
- D. Colors, and Patterns: As selected by Architect from manufacturer/suppliers' full product color range.
1. There will be no additional cost allowance for premium color selections, or for selection of different colors for different rooms up to a maximum 6 colors.

2.4 ACCESSORIES

- A. Edge Treatment: Same as laminate cladding on horizontal surfaces.
- B. Grommets: Doug Mockett & Co. Inc., Manhattan Beach, CA, 310-318-2491, or equal.
1. Type: SG Series, or EDP Series; coordinate data connection requirements with Owner.
 2. Material and Color: As selected by Architect.
- C. Countertop Braces: A&M Brace as manufactured by A & M Hardware, Inc. or equal.
1. Size brace appropriate with size of countertop.
 2. Provide Häfele "Hebgo" (1100 lb. capacity) bracket, or equal at locations where continuous raceway runs directly below countertop brace.
 3. Provide largest brace available for given countertop depth to achieve maximum countertop support.
 4. Color: As selected by Architect from full range of manufacturer's standard colors. Multiple colors may be selected.
- D. Fasteners: Type and size as required.
- E. Adhesives: VOC compliant and passing NAAWS "Heat Resistance Test.". Do not use adhesives that contain urea formaldehyde.

PLASTIC-LAMINATE-CLAD COUNTERTOPS
SECTION 12 3623
3595001

2.5 FABRICATION

- A. General:
 - 1. Obtain field measurements, and verify dimensions before fabricating work.
 - 2. Comply with NAAWS Custom Grade requirements and ANSI A161.2.
- B. Core Material: Specified MDF.
- C. Fabricate to dimensions, profiles, and details shown.
- D. Build up countertop thickness to 1-1/2 inches at front, back, and ends with additional layers of core material laminated to top.
- E. Provide specified backing sheet at configurations and installation conditions recommended in the woodworking standard.
- F. All other Countertops: Provide roll-form 180-degree edge.
- G. Unless otherwise shown, round projecting or outside corners with 3/4-inch minimum radius or clip 45-degree angle corner.
- H. Provide joints only where maximum available lengths or countertop configuration requires a joint and where interfacing with existing. Where joints are required, balance and center. Make joints neat, flush and watertight.
- I. To greatest extent possible, complete fabrication and assembly before shipment to site.
 - 1. Disassemble components only as necessary for shipment and installation.
 - 2. Where necessary for fitting at site, provide extra borders and edges so as to allow scribing and trimming to fit.
- J. Precut openings for applied fixtures and fitting, where possible. Field cuts shall be performed by the fabricator.
- K. Conceal all fasteners.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Verify that backing has been installed at appropriate locations for anchorage.
- B. Examine shop-fabricated work for completion. Complete work as required.

3.2 INSTALLATION

- A. Install countertops in accordance with Section 11 of the NAAWS and requirements shown on the Drawings.

PLASTIC-LAMINATE-CLAD COUNTERTOPS
SECTION 12 3623
3595001

- B. Install countertops and backsplashes with concealed fastenings, securely attaching to cabinet bases or countertop braces / brackets at 36 inches on center maximum. Scribe neatly to walls or other adjoining surfaces.
- C. Make joints neatly, with uniform appearance.
- D. Install work plumb, level, true, and straight, with no distortions. Install with no variation in flushness of adjoining surfaces.
- E. Countertops shall be installed as required so that the height from finish floor to top of counter, and sink rim where occurs, does not exceed the specified height at any location along the countertop after installation.
- F. Shim as required, using concealed shims.
- G. Sealant: Install sealant as specified in Section 07 9200, Joint Sealants, to close small unavoidable gaps between counter and abutting surfaces, and at sinks. Sealant shall not be a substitute for tightly scribed work.
- H. Install, at no additional charge, extra stock grommets where directed by Owner following completion of countertop installation.

END OF SECTION

p:\sacramento\3595 tracy unified school district\001-000_villalovoz es new shade structures\08 specifications\06 spec\04 final\freiler\12 3623_plastic-laminate-clad countertops.docx
Last Updated: November 12, 2021

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes
 - 1. This section describes the basic requirements for the electrical work on this project.

1.2 REFERENCES

- A. National Electrical Contractors Association (NECA): Standard of Installation
- B. National Fire Protection Association (NFPA): 70E
- C. National Safety Council (NSC)
- D. Occupational Safety and Health Administration (OSHA)

1.3 SUBMITTALS

- A. Product Data
- B. Operation and Maintenance (O&M) Manuals
- C. Field Test Reports

1.4 QUALITY ASSURANCE

- A. Reference to Codes, Standards, Specifications and recommendations of technical societies, trade organizations and governmental agencies shall mean that latest edition of such publications adopted and published prior to submittal of the bid. Such codes or standards shall be considered a part of this Specification as though fully repeated herein.
- B. When codes, standards, regulations, etc. allow Work of lesser quality or extent than is specified under this Division, nothing in said codes shall be construed or inferred authority for reducing the quality, requirements, or extent of the Contract Documents. The Contract Documents address the minimum requirements for construction.
- C. Work shall be performed in accordance with all applicable requirements of the edition indicated on the drawings of all governing codes, rules and regulations including but not limited to the following minimum standards, whether statutory or not:
 - 1. California Electric Code (CEC)
 - 2. California Building Code (CBC)
 - 3. California Green Building Code (CGC)
 - 4. California Fire Code (CFC)

ELECTRICAL BASIC REQUIREMENTS

SECTION 26 0100

3595001000

5. California Energy Code (CENC)
 6. California Mechanical Code (CMC)
 7. California Plumbing Code (CPC)
- D. Standards: Equipment and materials specified under this Division shall conform to the following standards where applicable:
1. ACI American Concrete Institute
 2. ANSI American National Standards Institute
 3. ASTM American Society for Testing Materials
 4. CBM Certified Ballast Manufacturers
 5. ETL Electrical Testing Laboratories
 6. FS Federal Specification
 7. IEEE Institute of Electrical and Electronics Engineers, Inc.
 8. IPCEA Insulated Power Cable Engineer Association
 9. NEMA National Electrical Manufacturer's Association
 10. UL Underwriters' Laboratories
- E. Independent Testing Agency qualifications:
1. Testing Agency shall be an independent testing organization that will function as an unbiased authority, professionally independent of Manufacturer, Supplier and Contractor, furnishing and installing equipment or system evaluated by Testing Agency.
 2. Testing Agency shall be regularly engaged in the testing of electrical equipment, devices, installations, and systems.
 3. Testing Agency shall meet Federal Occupational Safety and Health Administration (OSHA) requirements for accreditation of independent testing laboratories, Title 9, Part 1907.
 4. On-site technical personnel shall be currently certified by the International Electrical Testing Association in electrical power distribution system testing.
 5. Testing Agency shall use technicians who are regularly employed by the firm for testing services.
 6. Contractor shall submit proof of above Testing Agency qualifications with bid documentation upon request.
- F. All base material shall be ASTM and/or ANSI standards.
- G. All electrical apparatus furnished under this Section shall conform to NEMA standards and the NEC and bear the UL label where such label is applicable.
- H. Certify that each welder performing Work has satisfactorily passed AWS qualification tests for welding processes involved and, if pertinent, has undergone re-certification.

PART 2 - PRODUCTS

- A. SEE SCHEDULES ON ELECTRICAL PLANS and other Division 26 sections

PART 3 – EXECUTION

3.1 ROUGH-IN

- A. Contractor shall verify lines, levels and dimensions indicated on the construction document drawings and shall be responsible for the accuracy of the setting out of Work and for its strict conformance with existing conditions at the Project site.
- B. Verify final locations for rough-ins with field measurements and with the requirements for the actual equipment to be connected.
- C. Refer to equipment specifications in other sections for equipment rough-in requirements.

3.3 INSTALLATION

- A. Preparation, sequencing, handling, and installation shall be in accordance with Manufacturer's written instructions and technical data particular to the product specified and/or accepted equal except as otherwise specified.
- B. Comply with Shop Drawings prepared by Manufacturer.
- C. Verify all dimensions by field measurements.
- D. Arrange for chases, slots, and openings in other building components during progress of construction, to allow for electrical installations.
- E. Coordinate the installation of required supporting devices and sleeves to be set in poured-in-place concrete and other structural components, as they are constructed.
- F. Sequence, coordinate and integrate installations of electrical materials and equipment for efficient flow of the Work. Give particular attention to large equipment requiring positioning prior to closing in the building.
- G. Where mounting height is not detailed or dimensioned, contact the Architect for direction prior to proceeding with rough-in.
- H. Coordinate connection of electrical systems with exterior underground and overhead utilities and services. Comply with requirements of governing regulations, franchised service companies and controlling agencies. Provide required connection for each service.
- I. Install systems, materials, and equipment to conform with approved submittal data, including coordination drawings, to greatest extent possible. Conform to arrangements indicated by the construction documents, recognizing that portions of the Work are indicated only in diagrammatic form. Where coordination requirements conflict with individual system requirements, refer conflict to the Architect.

ELECTRICAL BASIC REQUIREMENTS

SECTION 26 0100

3595001000

- J. Install systems, materials, and equipment level and plumb, parallel and perpendicular to other building systems and components, where installed exposed in finished spaces.
- K. Install electrical equipment to facilitate servicing, maintenance and repair or replacement of equipment components. As much as practical, connect equipment for ease of disconnecting, with minimum of interference with other installations.
- L. Coordinate electrical systems, equipment, and materials installations with other building components.
- M. Provide access panel or doors where devices or equipment are concealed behind finished surfaces.
- N. Install systems, materials and equipment giving right-of-way priority to other systems that are required to maintain a specified slope.
- O. Conform to the National Electrical Contractors' Association "Standard of Installation" for general installation practice.

3.3 CUTTING, PATCHING, PAINTING, AND SEALING

- A. Structural members shall in no case be drilled, bored, or notched in such a manner that will impair their structural value. Cutting of holes, if required, shall be done with core drill and only with the approval of the Architect and Structural Engineer.
- B. Protection of Installed Work: During cutting and patching operations, protect adjacent installations.
- C. Application of joint sealers:
 - 1. General: Comply with joint sealer Manufacturers' printed application instructions applicable to products and applications indicated, except where more stringent requirements apply.
 - 2. Installation of fire-stopping sealant: Install sealant, including forming, packing and other accessory materials, to fill openings around electrical services penetrating floors and walls, to provide fire-stops and fire-resistance ratings indicated for floor or wall assembly in which penetration occurs. Comply with installation requirements established by testing and inspecting agency.

3.4 FIELD QUALITY CONTROL

- A. General testing requirements:
 - 1. The purpose of testing is to ensure that all tested electrical equipment, both Contractor and Owner supplied, is operational and within industry and Manufacturer's tolerances and is installed in accordance with design Specifications.

ELECTRICAL BASIC REQUIREMENTS
SECTION 26 0100
3595001000

2. Tests and inspections shall determine suitability for energization.
 3. Perform tests in presence of the Owner's Representative and furnish test equipment, facilities and technical personnel required to perform tests.
 4. Tests shall be conducted during the construction period and at completion to determine conformity with applicable codes and with these Specifications.
- B. Tests: In addition to specific system test described elsewhere, tests shall include:
1. Equipment operations: Test motors for correct operation and rotation.
 2. Lighting control circuits: Test lighting circuits for correct operation through their control devices.
 3. Alarm and interlock systems: Produce malfunction symptoms in operating systems to test alarm and interlock systems. In addition, all specific tests described in the fire alarm system shall be performed.
 4. Circuit numbering verification: Select on a random basis various circuit breakers in the panelboards and cycle them on and off to verify compliance of the typed panel directories with actual field wiring.
 5. Voltage check:
 - a. At completion of job, check voltage at several points of utilization on the system that has been installed under this Contract. During test, energize all installed loads.
 - b. Adjust taps on transformers to give proper voltage, which is 118 to 122 volts for 120 volt nominal systems and proportionately equivalent for higher voltage systems. If proper voltage cannot be obtained, inform the Owner and the serving Utility Company.
- C. Contractor shall provide test power required when testing equipment before service energization and coordinate availability of test power with General Contractor after service energization. The Contractor shall provide any specialized test power as needed or specified herein.
- D. Testing safety and precautions:
1. Safety practices shall include the following requirements:
 - a. Applicable State and Local safety operating procedures.
 - b. OSHA
 - c. NSC
 - d. NFPA 70E
 2. All tests shall be performed with apparatus de-energized and grounded except where otherwise specifically required ungrounded by test procedure.
- E. Calibration of test equipment:
1. Testing Agency shall have calibration program that assures test instruments are maintained within rated accuracy.
 2. Instruments shall be calibrated in accordance with the following frequency schedule:
 - a. Field instruments: Analog, 6 month maximum; Digital, 12 months

ELECTRICAL BASIC REQUIREMENTS

SECTION 26 0100

3595001000

- maximum.
 - b. Laboratory instruments: 12 months.
 - c. Leased specialty equipment: 12 months where accuracy is guaranteed by lessor.
 - 3. Dated calibration labels shall be visible on test equipment.
 - 4. Records, which show date and results of instruments calibrated or tested, must be kept up-to-date.
 - 5. Up-to-date instrument calibration instructions and procedures shall be maintained for test instrument.
 - 6. Calibration standards shall be of higher accuracy than instrument tested.
 - 7. Equipment used for field testing shall be more accurate than instrument being tested.
- F. Coordinate with General Contractor regarding testing schedule and availability of equipment ready for testing.
- G. Notify Owner one week in advance of any testing.
- H. Any products which fail during the tests or are ruled unsatisfactory by the Owner's Representative shall be replaced, repaired, or corrected as prescribed by the Owner's Representative at the expense of the Contractor. Tests shall be performed after repairs, replacements or corrections until satisfactory performance is demonstrated.
- I. Testing Agency shall maintain written record of tests and shall assemble and certify final test report. All test results/reports shall be submitted to the Electrical Engineer for review.
- J. Include all test results in the maintenance manuals.

3.5 CLEANING

- A. Prior to energizing of electrical equipment, the Contractor shall thoroughly clean the interior of enclosures from construction debris, scrap wire, etc. using Manufacturer's approved methods and materials.
- B. Upon completion of Project, prior to final acceptance, the Contractor shall thoroughly clean both the interior and exterior of all electrical equipment per Manufacturers approved methods and materials. Remove paint splatters and other spots, dirt, and debris.
- C. Touch-up paint any marks, blemishes or other finish damage suffered during installation.

- END OF SECTION -

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes conduit, surface raceways, J-hooks, wireways, outlet boxes, pull and junction boxes, concrete pullboxes and vaults, floor boxes.

1.2 REFERENCES

1.3 AMERICAN NATIONAL STANDARDS INSTITUTE:

- A. ANSI C80.1 - Rigid Steel Conduit, Zinc Coated.
- B. ANSI C80.3 - Specification for Electrical Metallic Tubing, Zinc Coated.

1.4 NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION:

- A. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum).
- B. NEMA FB 1 - Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit and Cable Assemblies.
- C. NEMA OS 1 - Sheet Steel Outlet Boxes, Device Boxes, Covers, and Box Supports.
- D. NEMA OS 2 - Nonmetallic Outlet Boxes, Device Boxes, Covers, and Box Supports.
- E. NEMA RN 1 - Polyvinyl Chloride (PVC) Externally Coated Galvanized Rigid Steel Conduit and Intermediate Metal Conduit.
- F. NEMA TC 2 - Electrical Polyvinyl Chloride (PVC) Tubing and Conduit.
- G. NEMA TC 3 - PVC Fittings for Use with Rigid PVC Conduit and Tubing.

1.5 SYSTEM DESCRIPTION

- A. Raceway and boxes located as indicated on Drawings, and at other locations required for splices, taps, wire pulling, equipment connections, and compliance with regulatory requirements. Raceway and boxes are shown in approximate locations unless dimensioned. Provide raceway to complete wiring system.
- B. All wiring shall be installed in raceway.
- C. Provide raceway as follows:
 - 1. Underground: Provide thickwall nonmetallic conduit. Provide cast metal boxes or nonmetallic handhole.
 - 2. In Slab Above Grade: Not permitted.
 - 3. Below Slab on Grade: Use thickwall nonmetallic conduit. Terminate with coated rigid steel elbows and short length of coated rigid steel conduit out of concrete.

RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

SECTION 26 0533

3595001000

4. Outdoor Locations, Above Grade: Provide galvanized rigid steel conduit. Provide cast metal outlet, pull, and junction boxes.
5. Wet and Damp Locations: Provide galvanized rigid steel conduit. Provide cast metal outlet, junction, and pull boxes. Provide flush mounting outlet box in finished areas.
6. Concealed Dry Locations: Provide electrical metallic tubing. Provide sheet-metal boxes. Provide flush mounting outlet box in finished areas. Provide hinged enclosure for large pull boxes where shown on drawings. Provide J-hooks when shown on plans.
7. Exposed Interior Dry Locations: Use rigid steel conduit or intermediate metal conduit below eight feet or where subject to damage. Use rigid steel conduit, intermediate metal conduit, or electrical metallic tubing above eight feet or in electrical, mechanical or telecommunication rooms. Use sheet-metal or cast metal boxes. Use flush mounting outlet box in finished areas. Provide hinged enclosure for large pull boxes.

1.6 DESIGN REQUIREMENTS

- A. Minimum Raceway Size: 0.75 inch unless otherwise specified.
- B. Minimum Raceway Size for Data Communications: 1.00 inch unless otherwise specified.
- C. Minimum Raceway Size for Telecommunications: 1.00 inch unless otherwise specified.
- D. Minimum Raceway Size for AV Systems: 1.00 inch unless otherwise specified.

1.7 CLOSEOUT SUBMITTALS

- A. Project Record Documents:
 1. Record actual routing of conduits larger than 2 inches.
 2. Record actual locations and mounting heights of outlet, pull, and junction boxes.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Protect conduit from corrosion and entrance of debris by storing above grade. Provide appropriate covering.
- B. Protect PVC conduit from sunlight.

1.9 COORDINATION

- A. Coordinate mounting heights, orientation and locations of outlets mounted above counters, benches, and backsplashes.
- B. Coordinate Work of this Division and Work of other Divisions in advance of installation. Provide additional Work to overcome tight conditions at no increase in Contract Sum.
- C. Coordinate installation of outlet boxes for equipment specified in other divisions.

PART 2 - PRODUCTS

2.1 METAL CONDUIT

- A. Rigid Steel Conduit: ANSI C80.1.
- B. Rigid Aluminum Conduit: ANSI C80.5.
- C. Intermediate Metal Conduit (IMC): Rigid steel.
- D. Fittings and Conduit Bodies: NEMA FB 1. Fittings shall be steel/malleable iron with threaded fittings. Use insulated metallic bushings with lug where ground connections are required. Use plastic bushing for non-bonding applications.

2.2 PVC COATED METAL CONDUIT

- A. Product Description: NEMA RN 1; rigid steel conduit with external PVC coating, 40 mil thick.
- B. Fittings and Conduit Bodies: NEMA FB 1; steel fittings with external PVC coating to match conduit.

2.3 FLEXIBLE METAL CONDUIT

- A. Product Description: Interlocked steel construction.
- B. Fittings: NEMA FB 1.

2.4 LIQUIDTIGHT FLEXIBLE METAL CONDUIT

- A. Product Description: Interlocked steel construction with PVC jacket.
- B. Fittings: NEMA FB 1.

2.5 ELECTRICAL METALLIC TUBING (EMT)

- A. Product Description: ANSI C80.3; galvanized tubing.
- B. Fittings and Conduit Bodies: NEMA FB 1; steel couplings and connectors. Box connectors shall have with insulated throat. Set screw type couplings.

2.6 NONMETALLIC CONDUIT

- A. Product Description: NEMA TC 2; Schedule 40 PVC.
- B. Fittings and Conduit Bodies: NEMA TC 3.

2.7 SURFACE RACEWAY (WIREMOLD)

- A. Product Description: Surface raceway as shown on plans. Raceway shall be Wiremold or equal.

RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

SECTION 26 0533

3595001000

- B. Fittings: Provide all supports, adapters, clips, elbows, covers, device fittings, and other hardware as required for a complete installation. Provide B-Line "transition" boxes to clear offset surfaces. Supports shall be concealed, exposed straps are not allowed.
- C. Finish:
 - 1. Steel raceway and associated transition boxes and exposed hardware shall be spray painted with two coats of semi-gloss acrylic enamel paint, color as directed by Architect.
 - 2. Aluminum raceway shall be provided with factory finish, color as directed by Architect. Transition boxes shall be spray painted with two coats of semi-gloss acrylic enamel paint, color as directed by Architect.
 - 3. Plastic raceway shall be provided with factory finish, color as directed by Architect. Transition boxes shall be spray painted with two coats of semi-gloss acrylic enamel paint, color as directed by Architect.
 - 4. Coordinate all colors with Architect prior to ordering.

2.8 J-HOOKS

- A. Product Description: Low voltage signal cable J-Hooks shall be Panduit. Provide with support device for construction encountered.

2.9 WIREWAY

- A. Product Description: General purpose for indoor applications and raintight type for outdoor locations wire way.
- B. Knockouts: Manufacturer's standard.
- C. Cover: Hinged cover with full gaskets.
- D. Connector: Flanged.
- E. Fittings: Lay-in type with removable top, bottom, and side; captive screws and drip shield for outdoor.
- F. Finish: Rust inhibiting primer coating with gray enamel finish.

2.10 OUTLET BOXES

- A. All boxes shall be suitable for the environment in which they are installed.
- B. Sheet Metal Outlet Boxes: NEMA OS 1, galvanized steel.
 - 1. Luminaire and Equipment Supporting Boxes: Rated for weight of equipment supported; furnish 0.5-inch male fixture studs where required.
 - 2. Boxes for shall be 1.5-inch-deep by 4-inch square minimum for single devices.
 - 3. Boxes for shall be 1.5-inch-deep by 4-11/16 inch square minimum for two devices.
 - 4. Boxes for data and signal outlets shall be 2-1/8-inch-deep by 4-11/16-inch square minimum.
 - 5. Concrete Ceiling Boxes: Concrete type.

RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

SECTION 26 0533

3595001000

6. Provide rings as required.

- C. Cast Boxes: NEMA FB 1, Type FD, aluminum. Furnish gasketed cover by box manufacturer. Furnish threaded hubs.

2.11 BOX EXTENSIONS

- A. At rooms being remodeled and where existing walls are to receive new finish material, replace existing plaster rings with new rings.

2.12 PULL AND JUNCTION BOXES

- A. Boxes having an internal volume less than 100 cubic inches shall be as specified for outlet boxes. Boxes having internal volume greater than 100 cubic inches shall be of panelboard type construction except that covers shall be secured by screws or bolts.
- B. Boxes exposed to rain or installed in wet locations shall be specifically designed for the purpose.
- C. All boxes shall be installed so that covers are accessible after completion of the installation.
- D. Boxes shall not be installed in finished areas unless specific approval for such installation is granted by Architect.

2.13 CONCRETE PULLBOXES AND VAULTS

- A. Boxes: Boxes shall be precast, high density reinforced concrete. In areas of vehicular traffic, boxes shall be H20 rated.
- B. Extensions: Extensions shall be provided at each pullbox. Provide a minimum of (1) extension. Provide additional extension(s) as required to provide space in box for code required cable bending.
- C. Covers: Covers in concrete or asphalt shall be galvanized. In all other areas, covers shall be steel checker plate. In areas of vehicular traffic, lids shall be galvanized steel, H20 rated. All covers shall be provided with hold-down bolts.
- D. Floor: Provide poured concrete slab as detailed on plans. At H20 rated boxes, provide manufacturer's concrete slab.
- E. Size: Provide size as noted on plans. If size is not shown, provide boxes sized per codes.
- F. Labeling: Covers shall be factory marked as shown on plans.

2.14 FLUSH MULTI SERVICE FLOOR BOXES (4 PORT)

- A. Floor boxes shall be cast iron, fully adjustable, Walker RFB4-CI-1 with FPBTCAL cover. Provide brackets required to mount devices shown on plans. Provide blank plates at unused ports.

RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

SECTION 26 0533

3595001000

2.15 FLUSH MULTI SERVICE FLOOR BOXES (11 GANG):

- A. Floor boxes shall be steel, fully adjustable, Walker RFB11 with RFB119BTCAL cover. Provide brackets required to mount devices shown on plans. Provide blank plates at unused ports.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify outlet locations and routing and termination locations of raceway prior to rough-in.

3.2 EXISTING WORK

- A. Remove exposed abandoned raceway, including abandoned raceway above accessible ceiling finishes. Cut raceway flush with walls and floors, and patch surfaces.
- B. Remove concealed abandoned raceway to its source.
- C. Disconnect abandoned outlets and remove devices. Remove abandoned outlets when raceway is abandoned and removed. Install blank cover for abandoned outlets not removed.
- D. Maintain access to existing boxes and other installations remaining active and requiring access. Modify installation or provide access panel.
- E. Extend existing raceway and box installations using materials and methods [compatible with existing electrical installations, or] as specified.
- F. Clean and repair existing raceway and boxes to remain or to be reinstalled.
- G. At rooms being remodeled and where existing walls are to receive new finish material, replace existing plaster rings with new rings with depth required to bring box flush with new finish. Contractor shall review Architectural drawings prior to bid to note walls receiving new finishes (tackboards, sheetrock, etc.) and include the necessary work in bid.

3.3 INSTALLATION

- A. Ground and bond raceway and boxes.
- B. Fasten raceway and box supports to structure and finishes.
- C. Identify raceway and boxes.
- D. Arrange raceway and boxes to maintain headroom and present neat appearance.

3.4 INSTALLATION - RACEWAY

- A. Raceway routing is shown in approximate locations unless dimensioned. Route to complete wiring system.

RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

SECTION 26 0533

3595001000

- B. Unless otherwise specified, all raceway shall be installed concealed. Raceway may be run exposed on unfinished walls, in attic spaces, in electrical rooms and when routed to surface panels, cabinets or gutters.
- C. Arrange raceway supports to prevent misalignment during wiring installation.
- D. Support raceway using coated steel or malleable iron straps, lay-in adjustable hangers, clevis hangers, and split hangers.
- E. Group related raceway; support using conduit rack. Construct rack using steel channel and provide space on each for 25 percent additional raceways.
- F. Do not support raceway with wire or perforated pipe straps. Remove wire used for temporary supports
- G. Do not attach raceway to ceiling support wires or other piping systems.
- H. Construct wire way supports from steel channel.
- I. Route exposed raceway parallel and perpendicular to walls.
- J. Route raceway installed above accessible ceilings parallel and perpendicular to walls.
- K. Route conduit in and under slab from point-to-point.
- L. Maintain clearance between raceway and piping for maintenance purposes.
- M. Maintain 12-inch clearance between raceway and surfaces with temperatures exceeding 104 degrees F.
- N. Cut conduit square using saw or pipe cutter; de-burr cut ends.
- O. Bring conduit to shoulder of fittings; fasten securely.
- P. Join nonmetallic conduit using cement as recommended by manufacturer. Wipe nonmetallic conduit dry and clean before joining. Apply full even coat of cement to entire area inserted in fitting. Allow joint to cure for minimum 20 minutes.
- Q. Install conduit hubs to fasten conduit to sheet metal boxes in damp and wet locations and to cast boxes.
- R. Install no more than equivalent of three 90-degree bends between boxes. Install conduit bodies to make sharp changes in direction, as around beams. Install factory elbows for bends in metal conduit larger than 2-inch size.
- S. Avoid moisture traps; install junction box with drain fitting at low points in conduit system.
- T. Install fittings to accommodate expansion and deflection where raceway crosses seismic and expansion joints.
- U. Install suitable pull string or cord in each empty raceway except sleeves and nipples.

RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

SECTION 26 0533

3595001000

- V. Install suitable caps to protect installed conduit against entrance of dirt and moisture.
- W. Surface Raceway:
 - 1. Anchor raceway to structural members using screws. Supports shall be concealed. Space screws 24" maximum on center. Each run shall have a minimum of (2) screws.
 - 2. Mount plumb and level.
 - 3. Install insulating bushings and inserts at connections to outlets and corner fittings.
 - 4. Raceway shown on plans is schematic. Contractor shall coordinate exact routing and installation with building conditions and provide all parts, pieces, elbows, transition boxes and other items as required for a complete, closed and professionally installed installation.
 - 5. Coordinate exact routing with Architect prior to installation.
- X. J-Hooks:
 - 1. Provide J-hooks 48" maximum on center.
 - 2. All cable to be run parallel and perpendicular to building lines.
 - 3. Provide mounting hardware as required.
 - 4. Provide Unistrut channels between structural members as required.
 - 5. Provide 24" long 2" conduit sleeves through walls, draft stops, etc. Provide as many as necessary to accommodate cables in contract plus two extra capped at each end for future cabling. All conduits shall be provided with bushed ends.
- Y. Close ends and unused openings in wire way.

3.5 EXCAVATING AND TRENCHING:

- A. Perform all excavations as required for the installation of the work included under this Section, including shoring of earth banks to prevent cave-ins and to protect workmen and equipment.
- B. Restore all surfaces, roadways, walks, curbs, walls, existing underground installation, etc., damaged or cut as a result of the excavations to their original condition in a manner approved by the Architect.
- C. Stop machine excavation for trenches, in solid ground, several inches above required grade line, then trim trench bottom by hand to accurate grade so that a firm and uniform bearing throughout entire length of duct is provided. In lieu of above hand excavation in bottom of trench, Contractor may excavate to depth no less than 6" below required grade line and place a bed of sand or granular soil, properly compacted to provide a uniform grade and to provide a firm support for duct throughout its entire length.
- D. Minimum conduit depth of pipe crown shall be 2'0" below finished or natural grade, unless detailed otherwise on Drawings. Conduits under parking lots, roadways, driveways, fire truck access routes, and other areas subject to vehicular traffic shall be installed a minimum of 24" below grade.

3.6 BACKFILLING:

- A. No backfilling operations shall begin until the required tests and inspection has been made. Should any of the work be enclosed or covered up before it has been approved, Contractor shall, at his expense, uncover the work.
- B. After it has been inspected, tested, and approved, he shall make all repairs necessary to restore the work of other contractors to the condition in which it was found at the time of uncovering.
- C. Except under existing paved area, walks, roads, or similar surfaces, and in cases where rock is encountered, backfill more than 12" above the top of the pipe shall be made using suitable excavated material placed in 6" layers measured before compaction, and tamped by machine.
- D. Surface work shall be replaced to match the existing.
- E. Entire backfill for bored excavations under existing pavement, walks, roads, or similar surfaces, shall be made with clean sand compacted by flooding.
- F. The contractor shall install a marking tape 6" below grade and directly above all electrical conduits. The tape shall consist of a 4 mil insert plastic film specifically formulated for prolonged use underground. It shall be highly resistant to alkalis, acids and other destructive agents found in the soil. Tape shall have a minimum tensile strength of 20 lbs. per 3" with strips and a minimum elongation of 500%. Tape shall bear a continuous painted message repeated every 16" to 36" warning of the installation buried below. The message shall read "CAUTION – ELECTRICAL POWER LINE BURIED BELOW" or "CAUTION – ELECTRICAL SIGNAL LINES BURIED BELOW" as applies. Installation instruction for the tape shall be printed with each message along the entire length. The tape shall be as that manufactured by Reef Industries, Inc., or approved equal. For those installations involving non-metallic pipe, tape shall be aluminum foil encased in two layers of inert plastic film enabling the tape to be inductively located. Terre Tape "D" Warning Tapes are acceptable. When conduit below is plastic, tape shall have metallic content and shall respond to metal detectors. Do not exclude this. It will be required to verify the installation of this tape.

3.7 FLASHING AND SEALING:

- A. Flash and counterflash roof and wall penetrations in manner described under other applicable sections of this Specification and as approved by the Architect.
- B. Conduits, ducts, etc., passing through finished walls and ceilings shall be fitted with steel escutcheon plates, chrome or paint finish as directed.
- C. Conduits which penetrate floor slabs and concrete or masonry walls shall be grouted and sealed watertight at penetration.
- D. Conduits penetrating exterior walls other than concrete or masonry shall be sealed watertight with polyurethane sealant.

RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

SECTION 26 0533

3595001000

- E. Underground conduits stubbing up into a room shall be sealed around cables or pullstring with foam sealant.
- F. All flashing and sealing shall be provided by this Contractor.

3.8 INSTALLATION – BOXES

- A. Boxes shall be accurately placed as shown on Drawings or as close thereto as possible. Contractor shall refer to Drawings, specifications, and submittals covering work of the other trades to coordinate outlet location. In the event of conflict between planned locations of outlet and other equipment or furnishing, Contractor shall not proceed until direction has been given by Architect.
- B. Unless otherwise specified or shown on Drawings, boxes shall be flush mounted with front edge of box or ring flush with wall or ceiling finish. Use plaster ring of appropriate depth in plastered or gypboard applications. Contractor shall review architectural drawings and note wall and ceiling construction and finishes for each wall.
- C. Boxes shall not be installed back-to-back in walls. To prevent sound transfer, outlets, switches, etc. shown on opposing sides of the same wall shall be installed in separate stud spaces, except that outlets installed at different elevations may occupy the same stud space when box separation exceeds 18". Where these requirements cannot be met, Contractor shall provide insulation material between boxes.
- D. Orient boxes to accommodate wiring devices.
- E. Install pull boxes and junction boxes above accessible ceilings and in unfinished areas only.
- F. In Accessible Ceiling Areas: Install outlet and junction boxes no more than 6 inches from ceiling access panel or from removable recessed luminaire.
- G. Locate flush mounting box in masonry wall to require cutting of masonry unit corner only. Coordinate masonry cutting to achieve neat opening.
- H. Install stamped steel bridges to fasten flush mounting outlet box between studs.
- I. Install flush mounting box without damaging wall insulation or reducing its effectiveness.
- J. Install adjustable steel channel fasteners for hung ceiling outlet box.
- K. Do not fasten boxes to ceiling support wires or other piping systems.
- L. Support boxes independently of conduit.
- M. Install gang box where more than one device is mounted together. Do not use sectional box.
- N. Install gang box with plaster ring for single device outlets.

3.9 INSTALLATION CONCRETE PULLBOXES AND VAULTS

- A. Install boxes flush with finished grade or surface material.
- B. Install hold down bolts for all covers.
- C. Ground bond steel cover plate with insulated green grounding conductor.
- D. Grout between box and extension(s).
- E. Any box installed in areas of vehicular traffic shall be H20 rated. Contractor shall verify this requirement prior to ordering.

3.10 INTERFACE WITH OTHER PRODUCTS

- A. Install conduit to preserve fire resistance rating of partitions and other elements.
- B. Route conduit through roof openings for piping and ductwork or through suitable roof jack with pitch pocket. Coordinate location with roofing installation.
- C. Locate outlet boxes to allow luminaires positioned as indicated on reflected ceiling plan.
- D. Align adjacent wall mounted outlet boxes for switches, thermostats, and similar devices.

3.11 ADJUSTING

- A. Adjust flush-mounting outlets to make front flush with finished wall material.
- B. Install knockout closures in unused openings in boxes.

3.12 CLEANING

- A. Clean interior of boxes to remove dust, debris, and other material.
- B. Clean exposed surfaces and restore finish.

- END OF SECTION -

PART 1 – GENERAL

1.1 SUMMARY

- A. This section describes the requirements for the cabinets and enclosures for this project.

1.2 REFERENCES

- A. National Electrical Manufacturer's Association (NEMA):
 - 1. NEMA 250; Enclosures for Electrical Equipment.
 - 2. NEMA ICS 1; Industrial Control and Systems.
 - 3. NEMA ICS 4; Terminal Blocks and Industrial use.
 - 4. NEMA ICS 6; Enclosures for Industrial Controls and Systems.
- B. Underwriters Laboratories (UL):
 - 1. UL 50; Enclosures for Electrical Equipment.
 - 2. UL 65; Standards for Wired Cabinets.
 - 3. UL 1059; Terminal Blocks.
 - 4. UL 1773; Termination Boxes.

1.3 SUBMITTALS

- A. Product Data: Submit manufacturer's standard data for enclosures, and terminal cabinets.
- B. Manufacturer's Instructions: Submit application conditions and limitations of use stipulated by product testing agency specified under Regulatory Requirements. Include instructions for storage, handling, protection, examination, preparation, and installation of product.

1.4 QUALITY ASSURANCE

- A. All materials, equipment and parts comprising the units specified herein shall be new, unused, and currently under production.
- B. Only products and applications listed in this Section may be used on the Project unless otherwise submitted.

PART 2 - PRODUCTS

2.1 CABINETS AND ENCLOSURES

- A. Description: Interior Locations: NEMA 1. Exterior locations: NEMA 3R
- B. Construction: Shall be code gauge galvanized steel with standard concentric knockouts for conduit terminations. Size shall be as indicated on Drawings.

CABINETS AND ENCLOSURES
SECTION 26 2716
3595001000

- C. Backboard: Furnish 5/8-inch-thick plywood backboard for mounting terminal blocks. Paint with (3) coats of fire retardant white paint.
- D. Finish: Manufacturer's standard gray baked enamel finish.
- E. Covers: Continuous hinged steel door, lockable and keyed to match panelboard locks. Provide padlock hasp at exterior locations.
- F. Mounting:
 - 1. Flush cabinets shall be furnished with concealed trim clamps and shall be not less than 4 inches deep.
 - 2. Surface cabinets shall be furnished with screw cover trim, flush hinged door and shall not be less than 6 inches deep.

2.2 SIGNAL TERMINAL BACKBOARDS

- A. Furnish cabinet with 3/4-inch fire retardant plywood mounting backboard on interior unless otherwise indicated on Drawings. 8' high x width shown on plans or as required
- B. Finish: Paint with (3) coats of fire-retardant white paint

2.3 TERMINAL BLOCKS AND ACCESSORIES

- A. Terminal blocks: NEMA ICS 4; UL listed.
- B. Power terminals: Unit construction type, closed-back with tubular pressure screw connections, rated 600 volts.
- C. Identification: Identify terminal strips with permanent numbers.
- D. Wiring diagram: Provide wiring diagram in protective pocket on inside front cover of cabinet. Diagram shall indicate control wiring, connections, and layout of components within enclosure.

2.4 HINGED COVER ENCLOSURES

- A. Description: NEMA 250, Type 1 (Interior) and 3R (Exterior) steel enclosure
 - 1. Covers: Continuous hinge, held closed by flush latch operable by key.
 - 2. Furnish interior plywood panel for mounting terminal blocks and electrical components; finish with white enamel.
 - 3. Enclosure Finish: Manufacturer's standard enamel.

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Contractor shall thoroughly examine Project site conditions for acceptance of cabinets and enclosures installation to verify conformance with Manufacturer and Specification tolerances. Do not commence with installation until all conditions are made satisfactory.

3.2 INSTALLATION

- A. Set cabinets and enclosures plumb and symmetrical with building lines. Furnish and install all construction channel bolts, angles, etc. required to mount all equipment furnished under this Section of the Specifications.
- B. Cabinets and enclosures shall be anchored and braced to withstand seismic forces calculated in accordance with that referenced in Section 26 0100: Basic Electrical Requirement.
- C. "Train" interior wiring, bundle and clamp using specified plastic wire wraps.
- D. Install interior cabinets with top of enclosure 6'6" above finished floor.
- E. Install exterior cabinets with top of enclosure 6'6" above finished grade.
- F. Replace doors or trim exhibiting dents, bends, warps or poor fit that may impede ready access, security or integrity.
- G. Terminate conduit in cabinet with lock nut and grounding bushing.
- H. Terminate wiring on terminal blocks and identify each with heat shrink tags.

3.3 CLEANING

- A. Touch up scratched or marred surfaces to match original finish.
- B. Clean electrical parts to remove conductive and harmful materials.
- C. Remove dirt and debris from enclosure.
- D. Clean existing panelboards and load centers to remain or to be reinstalled.

- END OF SECTION -

PART 1— GENERAL

1.1 SUMMARY

- A. Section Includes
 - 1. This section describes the requirements for the circuit protective devices for this project.

1.2 REFERENCES

- A. Federal Specification (FS):
 - 1. FS W-C-375; Circuit Breakers, Molded Case, Branch Circuit and Service.
 - 2. FS W-F-870; Fuseholders (for Plug and Enclosed Cartridge Fuses).
- B. Underwriters Laboratories, Inc. (UL):
 - 1. UL 248(1-16); Low-Voltage Fuses.
 - 2. UL 489; Molded-Case Circuit Breakers, Molded-Case Switches and Circuit Breaker Enclosures.
 - 3. UL 512; Fuseholders.
 - 4. UL 1066; Low Voltage AC and DC Power Circuit Breakers Used in Enclosures.
- C. National Electrical Manufacturer Association (NEMA):
 - 1. NEMA AB 1; Molded Case Circuit Breakers.

1.3 SUBMITTALS

- A. Product Data
- B. Operation and Maintenance (O&M) Manuals

1.4 QUALITY ASSURANCE

- A. All materials, equipment and parts comprising the units specified herein shall be new, unused, and currently under production.
- B. Only products and applications listed in this Section may be used on the Project unless otherwise submitted.

1.5 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Delivery: Overcurrent Protective Device components shall not be delivered to the Project site until protected storage space is available. Storage outdoors covered by rainproof material is not acceptable. Equipment damaged during shipment shall be replaced and returned to Manufacturer at no cost to Owner.

CIRCUIT PROTECTIVE DEVICES

SECTION 26 2800

3595001000

- B. Storage: Store in a clean, dry, ventilated space free from temperature extremes. Maintain factory wrapping or provide a heavy canvas/plastic cover to protect units from dirt, water, construction debris and traffic. Provide heat where required to prevent condensation.
- C. Handling: Handle in accordance with Manufacturer's written instructions. Be careful to prevent internal component damage, breakage, denting and scoring. Damaged units shall not be installed. Replace damaged units and return equipment to Manufacturer.

PART 2 - PRODUCTS

2.1 FUSES

- A. General: All power fuses shall be time-delay, high interrupting (300 K AIC), current limiting type, unless otherwise noted on the Drawings. All fuses shall be the product of a single Manufacturer and shall be selectively coordinated when applied in 2:1 ratios. Types of fuses shall be as follows:
 - 1. 0 - 600 amperes: UL Class J, dual element, time delay type fuse with separate overload and short-circuit elements. The fuse shall hold 500% of rated current for a minimum of 10 seconds.
 - 2. 601 - 4000 amperes: UL Class L, time delay type fuses with 99.9% pure silver fuse links and "O-rings" to seal between the end bells and the fuse barrel. Fuses shall hold 500% of rated current for a minimum of 4 seconds, clear 20 times rated current in 0.01 seconds or less.
 - 3. Motor branch circuit fuses (0-600 amperes): UL Class J dual element, time delay type fuse. Motor branch circuit fuses shall be sized for Type 2 coordination for the motor controller and back-up motor overload protection and shall be coordinated with motor starter overload relay heaters.
- B. Control and instrument fuses shall be suitable for installing in blocks or fuse holders. Exact type and rating shall be as recommended by the Manufacturer of the equipment being protected.
- C. Fuses for installation in current limiting circuit breakers or motor circuit protectors shall meet the specific requirements of the Manufacturers of that equipment to ensure compatibility.

2.2 MOLDED CASE CIRCUIT BREAKERS

- A. Unless noted otherwise, circuit breakers shall be molded case, bolt on and trip indicating.
- B. Where stationary molded case circuit breakers are indicated on the Drawings to be current limiting type, they shall be current limiting as defined by UL 489 and shall not employ any fusible elements.
- C. Circuit breakers shall have interrupting capacity not less than that indicated on the Drawings or if not indicated, not less than 25,000 RMS symmetrical amps for 480

volt systems and 10,000 RMS symmetrical amps for 208 volt systems.

- D. Covers shall be sealed on non-interchangeable breakers and trip unit covers shall be sealed on interchangeable trip breakers to prevent tampering. Circuit breaker ratings shall be clearly visible after installation or engraved nameplates shall be provided stating the rating. All ferrous parts shall be plated to minimize corrosion.
- E. Circuit breakers shall be toggle, quick-make and quick-break operating mechanisms with trip-free feature to prevent contacts being held closed against overcurrent conditions in the circuit. Trip position of the breakers shall be clearly indicated by operating handles moving to a center position.
- F. Multipole breakers shall have a single handle to open and close all contacts simultaneously in both manual operation and under automatic tripping. Interpole barriers shall be provided inside the breaker to prevent any phase-to-phase flashover. Each pole of the breaker shall have means for Arc extinguishing.
- G. All terminals shall be rated for aluminum or copper wire.
- H. Unless noted otherwise, circuit breakers with trip ratings 400 amp and smaller shall be ambient temperature compensated, thermal magnetic type unless otherwise noted. Breakers shall be of full size, 1" per pole type. Panels with more than one branch breaker larger than 100 amps shall be installed in distribution type panels.
- I. Accessories: Provide accessories as noted on the Drawings, i.e. shunt-trip, auxiliary contacts, undervoltage trip, alarm switch, etc.
- J. Spaces in the boards shall be able to accept any combination of 1, 2 or 3 pole circuit breakers as indicated. Provide all necessary bus, device supports and mounting hardware sized for frame, not trip rating.
- K. Series rated breakers are not acceptable unless specifically noted on the Drawings.

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Contractor shall thoroughly examine Project site conditions for acceptance of cabinets and enclosures installation to verify conformance with Manufacturer and Specification tolerances. Do not commence with installation until all conditions are made satisfactory.

3.2 INSTALLATION

- A. Install overcurrent protective devices in accordance with Manufacturer's written instructions, as indicated on the Drawings and as specified herein.
- B. Tighten electrical connectors and terminals; including screws and bolts, in accordance with equipment Manufacturers published torque-tightening values for

CIRCUIT PROTECTIVE DEVICES
SECTION 26 2800
3595001000

equipment connectors. Where Manufacturers torque requirements are not indicated tighten connectors and terminals to comply with tightening torque specified in UL Standard 486A.

- C. Install overcurrent protective devices and accessories in accordance with Manufacturer's written instructions and with recognized industry practices to ensure that protective devices comply with requirements. All devices shall be installed in accordance with applicable CEC and NEMA standards for installation.
- D. Circuit breakers serving "Fire Alarm Control Panel(s)" shall be red in color.

3.3 FIELD QUALITY CONTROL

- A. The Contractor shall supply a suitable and stable source of electrical power to each test site.
- B. Testing of overcurrent protective devices shall be done only after all devices are installed and system is energized.
- C. Prefunctional testing:
 - 1. Visual and mechanical inspection:
 - a. Inspect for physical damage, defects alignment and fit.
 - b. Perform mechanical operational tests in accordance with Manufacturer's instructions.
 - c. Compare nameplate information and connections to Contract Documents.
 - d. Check tightness of all control and power connections.
 - e. Check that all covers, barriers and doors are secure.
 - 2. Electrical tests:
 - a. Circuit continuity: All feeders shall be tested for continuity. All neutrals shall be tested for improper grounds.
 - b. Determine that circuit breaker will trip under overcurrent condition, with tripping time in conformance with NEMA AB 1 requirements.
 - c. Test all circuit breakers with frame size 225 amps and larger and 10 percent of all circuit breakers with frame sizes less than 225 amps in each panelboard, distribution board, switchboard, etc. unless otherwise noted.
- D. Contractor shall replace at no costs to the Owner all devices which are found defective or do not operate within factory specified tolerances.
- E. Contractor shall submit the final test report for review prior to Project closeout and final acceptance by the Owner. Test report shall indicate test dates, devices tested, results, observation, deficiencies and remedies. Test report shall be included in the operation and maintenance manuals.

3.4 ADJUSTING

CIRCUIT PROTECTIVE DEVICES
SECTION 26 2800
3595001000

- A. Adjust circuit breaker trip settings for coordination with other overcurrent protective devices in system.
- B. Adjust circuit breaker trip settings for adequate protection from overcurrent and fault currents.

3.5 CLEANING

- A. Upon completion of Project prior to final acceptance the Contractor shall thoroughly clean overcurrent protective devices per Manufacturer's approved methods and materials. Remove paint splatters and other spots, dirt and debris.

- END OF SECTION -

PART 1 - GENERAL

1.1 SUMMARY

- A. This section describes the basic requirements for the fire alarm system work on this project.

1.2 REFERENCES AND STANDARDS

- A. California Fire Code (CFC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. American National Standards Institute, Inc. (ANSI): ANSI C62.41
- C. National Fire Protection Association (NFPA): 72, 101
- D. Underwriter Laboratories, Inc. (UL)
 - 1. UL 38; Manual Signaling Boxes Fire Alarm Systems.
 - 2. UL 268; Smoke Detectors for Fire Alarm Signaling Systems.
 - 3. UL 268 A; Smoke Detectors for Duct Application.
 - 4. UL 464; Audible Signal Appliances.
 - 5. UL 497B; Protectors for Data Communications and Fire Alarm Circuits.
 - 6. UL 521; Heat Detectors for Fire Protective Signaling Systems.
 - 7. UL 864; Control Units and Accessories for Fire Alarm Systems.
 - 8. UL 1424; Cables for Power-Limited Fire-Alarm Circuits.
 - 9. UL 1480; Speakers for Fire Alarm, Emergency and Commercial and Professional Use.
 - 10. UL 1481; Power Supplies for Fire-Protective Signaling Systems.
 - 11. UL 1638 Visual Signaling Appliances Standard.
 - 12. UL 1711; Amplifiers for Fire Protective Signaling Systems.
 - 13. UL 1971 Signal Devices for Hearing Impaired.
- E. International Engineering Consortium (IEC): IEC 60849
- F. Factory Mutual System (FM) approval guide: FM P7825

1.3 SUBMITTALS

- A. Product Data
- B. Operation and Maintenance (O&M) Manuals
- C. Field Test Reports

**FIRE ALARM SYSTEM
SECTION 26 6116
3595001000**

1.4 QUALITY ASSURANCE

- A. All materials, equipment and parts comprising the units specified herein shall be new, unused, and currently under production.
- B. Only products and applications listed in this Section and in the Electrical Drawings may be used on the Project unless otherwise submitted.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Products furnished by the Manufacturers indicated in the Electrical Drawings and this section shall be acceptable if in compliance with all features specified herein
 - 1. Gamewell-FCI
 - 2. Cooper Wheelock

2.2 CONDUIT AND WIRE

- A. Conduit:
 - 1. Conduit shall be in accordance with the California Electrical Code (CEC).
 - 2. Where required, all wiring shall be installed in conduit. Conduit fill shall not exceed 40 percent of interior cross-sectional area where three or more cables are contained within a single conduit.
 - 3. Cable must be separated from any open conductors of power, or Class 1 circuits, and shall not be placed in any conduit, junction box or raceway containing these conductors, per CEC Article 760-29.
 - 4. Wiring for 24-volt DC control, alarm notification, emergency communication and similar power-limited auxiliary functions may be run in the same conduit as initiating and signaling line circuits. All circuits shall be provided with transient suppression devices and the system shall be designed to permit simultaneous operation of all circuits without interference or loss of signals.
 - 5. Conduit shall not enter the fire alarm control panel or any other remotely mounted control panel equipment or back boxes, except where conduit entry is specified by the Life Safety Control Panel (LSCP) manufacturer.
 - 6. Connectors shall be compression type fittings to join EMT to a box or enclosure and to couple two ends of EMT conduit. Fittings shall be: Zinc plated, steel UL listed concrete tight, and threadless where connecting to conduit. Male hub threads -NPSM (American National Standard Pipe Straight Mechanical) where connecting to box or cabinet with steel locknuts.
- B. Wire:
 - 1. Wiring shall be in accordance with state and national codes (e.g., CEC Article 760) and as recommended by the manufacturer of the fire alarm system. Number and size of conductors shall be as recommended by the fire alarm system manufacturer, but not less than 18 AWG (1.02 mm) for Initiating Device Circuits

and Signaling Line Circuits, and 14 AWG (1.63 mm) for Notification Appliance Circuits.

2. All wire and cable shall be listed and/or approved by a recognized testing agency for use with a protective signaling system.
 3. Wire and cable shall be installed in conduit or metal surface raceway when in exposed spaces. Minimum size of conduit shall be 3/4" inch. Utilize Wiremold 700 series surface raceway (in lieu of conduit) for area where conduit cannot be installed concealed. Cable above accessible ceiling can be installed free air when using applicable cable. Support all free air cable every 48" with j-hooks.
 4. All field wiring (with exception of external communications Ethernet) shall be electrically supervised for open circuit and ground fault.
 5. The LSCP shall be capable of T-tapping NFPA Style 4 (Class B) Signaling Line Circuits (SLCs). Systems which do not allow or have restrictions in, for example, the number of T-taps, length of T-taps etc., is not acceptable.
- C. Terminal Boxes, Junction Boxes and Cabinets: All boxes and cabinets shall be UL listed for their use and purpose.
- D. The fire alarm control panel shall be connected to a separate dedicated branch circuit, maximum 20 amperes. This circuit shall be labeled at the main power distribution panel as FIRE ALARM. LSCP primary power wiring shall be 12 AWG. The control panel cabinet shall be grounded securely to either a cold water pipe or grounding rod. The control panel enclosure shall feature a quick removal chassis to facilitate rapid replacement of the LSCP electronics.

2.3 FIRE ALARM DEVICES

- A. Initiation: See Component Schedule in the Electrical Drawings for details
1. Monitor Module
 2. Heat Detector
 3. Smoke Detector
- B. Notification: See Component Schedule in the Electrical Drawings for details
1. Strobe
 2. Combination Speaker-Strobe
 3. Sync Module

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Contractor shall thoroughly examine Project site conditions for acceptance of cabinets and enclosures installation to verify conformance with Manufacturer and Specification tolerances. Do not commence with installation until all conditions are made satisfactory.

FIRE ALARM SYSTEM
SECTION 26 6116
3595001000

3.2 INSTALLATION

A. General:

1. The 120/208-volt, 3 wire, 60 cycles AC emergency power supply required to power the system. Connect to red colored circuit breaker(s) in panel board. Identify circuit as "Fire Alarm Circuit Control".

B. Wiring:

1. Individual input and output device addressability as well as remote sensitivity measurement, supervision and power shall all be performed on the same pair of wires. Wiring shall be Class B.
2. Each Class B initiating circuit shall consist of a two (2)-wire circuit. allowing a maximum of 20 T-taps and not requiring any end-of-line device for supervision. Each initiating circuit shall accommodate up to 75% of the manufacturers maximum addressable programmable initiating devices, to allow for future expansion.
3. Wiring for shielding certain conductors from others or routing in separate raceways, shall be as recommended by the Manufacturer's current requirements.
4. All wiring shall be installed in a continuous steel conduit or metal surface raceway when in exposed spaces. All conduit fittings shall be steel compression. Conduit shall be of the size recommended by the equipment Supplier with a minimum of 3/4" inch.
5. Wire color-coding shall remain the same throughout the system.
6. No wiring other than that directly associated with life safety/fire alarm detection, alarms, or auxiliary fire protection functions (no 120 VAC), shall be permitted in life safety/fire alarm conduits.
7. Make conduit and wiring connections to sprinkler flow switches, PIV's, sprinkler valve monitors, door hold-open/closure devices, smoke management fans, smoke dampers, elevator controller, emergency generator, etc.
8. All wiring shall be checked and tested to ensure that there are no grounds, opens or shorts.
9. All life safety/fire alarm junction boxes shall be color-coded and marked
10. Wire nut splices are not allowed.
11. Wires shall be numbered at each connection, termination, and junction point. Wire numbering tags shall be Brady Perma-Code, Westline or equal wire markers. Each group of wires shall be tagged with its destination at each panel, terminal box or junction box.
12. All wire used on the life safety/fire alarm and communication system shall have a minimum insulation rating of 105 degrees C. Bell wire or thermostat wire is not acceptable.

3.3 FIELD QUALITY CONTROL

A. Pre-functional testing: Visual and mechanical inspection

1. Inspect for physical damage, defects alignment and fit.

2. Perform mechanical operational tests in accordance with Manufacturer's instructions.
3. Compare nameplate information and connections to Contract Documents.
4. Check tightness of all control and power connections.
5. Check that all covers, barriers and doors are secure.
6. Visually check all sampling pipes to ensure that all joints, fittings, bends, sampling points, etc., comply with the Specification.
7. Check the air sampling system to ensure the following features are operational and programmed in accordance with the specification.
 - a. Alarm threshold levels
 - b. Pipes in use
 - c. Detector address
 - d. Clock and date
 - e. Time delays
 - f. Air flow fault thresholds
 - g. Display buttons operable
 - h. Check to ensure that all ancillary warning devices operate as specified.
 - i. Check interconnection with LSCP to ensure correct operation.

B. Pre-functional testing: Electrical tests

1. The system shall be completely tested prior to final acceptance testing. All points shall be tested from point of initiation to the final point or points of annunciation. All circuits shall be tested for continuity and ability to transmit the required signal correctly to the LSCP. Any problem due to wrong wire type, wire twist, impedance, mismatches, noise filtering or shielding shall be completely corrected during pretesting and prior to any final acceptance tests.
2. Testing shall include each and every device in the system. Coordinate with other trades as necessary for testing.
3. Tamper switches: Verify "trouble" signal is received and alarmed on closing of each valve.
4. Smoke detectors and duct smoke detectors: Test with actual or approved artificial smoke. Verify that reset does not occur when devices are cleared of smoke. Verify supervisory circuit function. Perform pressure differential test on all duct-mounted smoke detectors.
5. Intelligibility testing shall be per IEC 60849 and verified and tested by a third-party testing organization.
6. Central station notification: Verify that one set of conductors in the terminal cabinet becomes a short circuit on any "trouble" condition and that the other set becomes a short circuit on any "alarm" condition. Verify that the conductor groups are labeled properly.

C. Contractor shall replace at no costs to the Owner all devices which are found defective or do not operate within factory specified tolerances.

**FIRE ALARM SYSTEM
SECTION 26 6116
3595001000**

END OF SECTION

PART 1 - GENERAL REQUIREMENTS

1.1 OVERVIEW

- A. Copper cabling will be Panduit with a 25 year Pan-Net warranty.
 - 1. At project completion, the contractor shall present to owner a single project binder with electronic and hard copies of test results, as built drawings, pictures, bill of materials listing part numbers, etc. and a Visio 2007 drawing electronic provided to owner's Information Services and Educational Technology (ISET) office which identifies all Data jack locations and port assigned numbers.
- B. The installing contractor shall furnish and install all hardware, cables, devices, and other materials even though not specifically mentioned herein, which are necessary for the proper integration of the system so that the system shall perform the functions listed herein in compliance with all specified requirements.
- C. A Contractor may use up to ONE sub-contractor to install all CAT6 data cabling. Contractor will provide 'As Builts' and warranty information to ISET department.
 - 1. The contractor shall have a minimum of five years professional field experience pulling/terminating fiber and Cat6 cable.
 - 2. The contractor shall possess a valid C-7 California State contractor's license. This license shall have been issued two (2) years prior to the date of the bid. No other license classification is acceptable.
 - 3. The contractor and/or sub-contractors shall have Panduit Certified Installers as well as Corning Certified NPI Installers.
- D. The contractor and/or sub-contractors shall have at least half BICSI installers and one RCDD who will work on the project.
 - 1. The contractor shall provide a twenty-five (25) year application performance warranty for all Panduit Pan-Net copper cable and connectivity products. The system shall be installed to meet all TIA/EIA commercial building wiring standards and installed per appropriate Panduit instruction sheets. If any Panduit product fails to perform as stated above, Panduit will provide new components at no charge.

1.2 ABBREVIATIONS

- A. A.P. - Wireless Access Point
- B. AFF - Above the finished floor
- C. BKBRD - Backboard
- D. E.F. - Entrance Facility (formerly called MPOE or MPOP)

DATA COMMUNICATIONS
SECTION 27 1000
3595001000

- E. E.R. - Equipment Room. A building/campus serving facility connecting backbone to horizontal cabling and housing the building/campus' core system equipment.
- F. IDF – Intermediate Distribution Facility
- G. ISP - Inside Plant
- H. MAC - Moves, Adds, and Changes
- I. MDF – Main Distribution Facility
- J. MM - Multimode fiber
- K. NEXT - Near End Crosstalk
- L. OSP - Outside Plant
- M. SM - Single mode fiber
- N. T.R./T.E. - Telecommunications Room/Enclosure. A floor serving facility connecting backbone and E.R. to horizontal cabling in a region on each floor.
- O. TBB - Telecommunications Bonding Backbone
- P. TGB - Telecommunications Ground Buss Bar
- Q. TMGB - Telecommunications Main Ground Buss Bar
- R. U.O.N. - Unless otherwise noted

1.3 RELATED DOCUMENTS

- A. In addition to these specifications, the contractor shall reference the following drawings and documents:
 - 1. Architectural / Engineer drawings
 - 2. Detail Visio 2007 As Built Drawings and Diagrams.
 - 3. Any addendum, hereafter release of specifications
 - 4. Panduit Pan-Net 25 year Warranty
- B. Contractor shall ensure that, manufacture, ANSI/TIA/EIA-586-B cable testing, and install of the telecommunications cabling network is per manufacturer's requirements and in accordance with NFPA-70 (National Electrical Code®), state codes, local codes, requirements of authorities having jurisdiction, and particularly the following standards:
 - 1. ANSI/TIA/EIA-568-B.1 - Commercial Building Telecommunications Cabling Standard, Part 1: General Requirements
 - 2. ANSI/TIA/EIA-568-B.2 - Commercial Building Telecommunications Cabling Standard, Part 2: Balanced Twisted Pair Cabling Components
 - 3. ANSI/TIA/EIA-568-B.3 - Optical Fiber Cabling Components Standard

4. ANSI/TIA/EIA-569-A - Commercial Building Standard for Telecommunications Pathways and Spaces
 5. ANSI/TIA/EIA-606(A) - The Administration Standard for the Telecommunications Infrastructure of Commercial Buildings
 6. ANSI/TIA/EIA-607(A) - Commercial Building Grounding and Bonding Requirements for Telecommunications
 7. ANSI/TIA/EIA-758(A) Customer-Owned Outside Plant Telecommunications Cabling Standard
 8. ISO/IEC 11801:2002 ed 2- International standard for Class F (Cat7)
 9. IEC 61076-3-104:2002- International standard for RJ quad jack
 10. ISO/IEC CD14165-114 - International standard for duplex gigabit on two pair Ethernet
 11. TIA TSB 155 - 10G Ethernet over existing Cat6 up to 50 meters
 12. ANSI/TIA/EIA 565.B.2,10 - Standard for Cat6
 13. Cal/OSHA-Pocket Guide for the Construction Industry (recent edition)
- C. Contractor shall install cabling in accordance with the most recent edition of BICSI publications:
1. BICSI - Telecommunications Distribution Methods Manual (TDMM)
 2. BICSI - Cabling Installation Manual
 3. BICSI - Customer-Owned Outside Plant Design Manual
- D. Federal, state, and local codes, rules, regulations, and ordinances governing the work, are as fully part of the specifications as if herein repeated or hereto attached. If the contractor shall note items in the drawings or the specifications, construction of which would be code violations, promptly call them to the attention of the owner's representative in writing. Where the requirements of other sections of the specifications are more stringent than applicable codes, rules, regulations, and ordinances, the specifications shall apply.

1.4 PRE-INSTALLATION MEETING

- A. Schedule a meeting a minimum of five calendar days prior to beginning work.
- B. Agenda: Clarify questions related to work to be performed, scheduling, coordination, labeling for data jacks, data jack layout on telco racks in MDF and IDFs, etc.
- C. Attendance: Communications systems installer, general contractor, architects representatives, and other parties affected by work.
- D. A copy of manufacturer warranty application shall be provided at this meeting.

1.5 WARRANTY

- A. The project shall be pre-registered with manufacturer before installation has begun.
- B. The installation will have to pass scan tests by a certified contractor.

DATA COMMUNICATIONS
SECTION 27 1000
3595001000

- C. The installation will have to be documented with labels and drawings.
- D. A 25-year PAN-NET manufacturer warranty covering all components, equipment and workmanship shall be passed through in writing with system documentation. The warranty period shall begin on the system's first use by the owner.

1.6 APPROVED PARTS LIST

The following is an approved parts list:

Wire Management

Manufacturer	Part Number	Description
Panduit		J-Hooks shall be Panduit
Panduit	WMP1E	2U Horizontal Wire management
Panduit	WMPSE	1U Horizontal Wire Management
Panduit	CLT100F-C3	1" Split Loom Tubing Orange
Panduit	CLT188F-X3	1.88" Split Loom Tubing Orange
		1" Fiber Innerduct
		2" Fiber Innerduct
Panduit	CWF400N	4" Conduit Waterfalls
Panduit	CCMKIT1	Cable Management Kit
Panduit	WMPVHC45E	Vertical Cable Manager Front & Rear
Panduit	NCMH2	2U Horizontal Cable Manager Front & Rear
Trilobular		Taptite II thread

Twisted Pair Products

Manufacturer	Part Number	Description
Panduit	PUR6004BU-U	Cat 6 Riser Blue
Panduit	PUR6004WH-U	Cat 6 Riser White
Panduit	PUR6004OR-U	Cat 6 Riser Orange
Panduit	PUR6004RD-U	Cat 6 Riser Red
Panduit	PUR6004YL-U	Cat 6 Riser Yellow
Panduit	PUR6004VL-U	Cat 6 Riser Violet
Panduit	PUP6004BU-U	Cat6 Plenum Blue
Panduit	PUP6004WH-U	Cat6 Plenum White
Panduit	PUP6004OR-U	Cat6 Plenum Orange
Panduit	PUP6004RD-U	Cat6 Plenum Red
Panduit	PUP6004YL-U	Cat6 Plenum Yellow
Panduit	PUP6004VL-U	Cat6 Plenum Violet
General Cable	7136100	Outside Plant Cat 6
Panduit	CFPE1WHY	1 Port White Faceplate
Panduit	CFPE2WHY	2 Port White Faceplate
Panduit	CFPE4WHY	4 Port White Faceplate
Panduit	CFPE6WHY	6 Port White Faceplate
Panduit	CFP2SY	Stainless Steel 2 Port Faceplate
Panduit	CJ688TGWH	Cat 6 Jack White
Panduit	CJ688TGOR	Cat 6 Jack Orange
Panduit	CJ699TGYL	Cat 6 Jack Yellow
Panduit	CJ688TGBL	Cat 6 Jack Blue
Panduit	CJ688TGVV	Cat 6 Jack Violet
Panduit	CJ688TGRD	Cat 6 Jack Red

DATA COMMUNICATIONS
SECTION 27 1000
3595001000

Panduit	CPPL24WBLY	Blank, Minicom, 24 port patch panel
Panduit	CPPL48WBLY	Blank, Minicom, 48 Port Patch Panel
Panduit	SRBWCY	Strain Relief for Patch Panel
Panduit	PSL-DCJB	Black out Module Red (Need White, Red Listed)
Panduit	PSL-DCJB-IW	Black out Module White
Panduit	PSL-DCJB	Black out Module
Panduit	C4PPLK	Replacement Label Kit
Panduit	UTPSP3RD	3 Foot Cat 6 Red Patch Cord
Panduit	UTPSP5RD	5 Foot Cat 6 Red Patch Cord
Panduit	UTPSP3OR	3 Foot Cat 6 Orange Patch Cord
Panduit	UTPSP6OR	5 Foot Cat 6 Orange Patch Cord

Raceway

<u>Manufacturer</u>	<u>Part Number</u>	<u>Description</u>
Panduit	LD3WH6-A	LD3 Raceway (Substitute 6 with 8 and 10, for Longer Lengths)
Panduit	LD5WH6-A	LD5 Raceway (Substitute 6 with 8 and 10, for Longer Lengths)
Panduit	LD10WH6-A	LD10 Raceway (Substitute 6 with 8 and 10, for Longer Lengths)
Panduit	CFXWH-E	Raceway Coupler (Replace 'X' with 3, 5, or 10 for the different size raceway)
Panduit	RAFXWH-E	Right Angle Fitting (Replace 'X' with 3, 5, or 10 for the different size raceway)
Panduit	ICFXWH-E	Inside Corner Fitting (Replace 'X' with 3, 5, or 10 for the different size raceway)
Panduit	OCFXWH-E	Outside Corner Fitting (Replace 'X' with 3, 5, or 10 for the different size raceway)
Panduit	DCFXWH-E	Drop Ceiling Fitting (Replace 'X' with 3, 5, or 10 for the different size raceway)
Panduit	JBX3510WH-A	Single Gang Outlet for LD Raceway

Tools

<u>Manufacturer</u>	<u>Part Number</u>	<u>Description</u>
Panduit	CGJT	
Panduit	EGJT	
Panduit	CWST	
Panduit	CJAST	
Panduit	TTS-20R0	Tak Tape Rolls
Panduit	HLS-75R0	Bulk Velcro

DATA COMMUNICATIONS
SECTION 27 1000
3595001000

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. The acceptable manufacturer for the cabling connectivity is Panduit/General copper or Panduit/Panduit copper.
- B. Part listed are the owner's standards and any substitutions shall be approved in writing through submittal.
- C. Panduit 25 year Pan-Net.
- D. Corning Cable

2.2 QUANTITIES

- A. Distances mentioned and shown on drawings or spreadsheets are approximate. Field verification shall be made prior to install.
- B. Quantities listed here and in "parts list" document take precedence over drawing quantities.

2.3 SYSTEM COMPONENTS

- A. Materials provided shall meet or exceed the standards/description listed below.
- B. Fiber Trunk Cable
 - 1. Corning 12 strand single mode outdoor riser fiber optic cable
- C. Horizontal Cable (Cat6):
 - 1. Solid copper, 24 AWG, 100 balanced twisted-pair (UTP) Category 6 cables with four individually twisted-pairs, which meet or exceed the mechanical and transmission performance specifications in ANSI/TIA/EIA-568-B.2 to 250 MHz. General Cables Genspeed 6000 Enhanced CAT6E meets the specification.
 - 2. Use plenum rated cable in PLENUM air environments only.
 - 3. Use gel-filled or other outdoor plant cables in OSP environments as under slab concrete, outside near water, etc.
- D. Connectors (Cat6):
 - 1. 8-pin modular, category 6, pinned to T5689B standard.
- E. Faceplates:
 - 1. Provide 1, 2, 4 or 6 port faceplates and use classic style with label window. Fill unused ports with blank inserts.
- F. Patch Frames:

1. Data frame is to be 19" rack mountable, 24 or 48 empty ports for 8-pin modular jacks. Panels shall include a window for labels. Note: unused ports are to be filled in with black blank inserts.

G. Wire management:

1. On racks the horizontal cable managers shall be Panduit center mounting brackets (WMPF1E) for the wire managers in front for easy access during MACs. Horizontal managers shall be a minimum 1 RU.
2. Vertical cable managers (WMPVHC45E) are to be same height as rack. With fingers in the rear and in the front. They shall to have a bend radius control or strain relief clips. Panduit vertical managers are to be used for extra capacity.
3. Cable runway shall be ladder style or mesh /solid cable tray with a 12" width and 4" depth. The runway shall be mounted to a support loading wall as well as supported to the rack. An angle transition shall be used for adjoining runways or 90 degree bends. A cable drop shall be used to protect cables transitioning from runway to point of termination. If using a ladder style, use cable fingers attached to the sides to prevent spilling of cable over the sides.

H. Cable Pathways:

1. J-hooks will be used for suspending cables. These hooks shall have a 50 cable capacity and optional mounting. Preferred hooks have a wheel attachment capability so cables will not be dragged across during installation. Ensure that bends and edges will not pinch or cut cable sheath. Provide enough J-hooks to keep pathway along walls, J-hooks shall not cross the room.
2. Penetrations through fire rated walls shall utilize a metallic assembly with fire stop built into the assembly. EZ Path mechanical fire stop by Specified Technologies meets this requirement and shall be used. There is no exception to this.

I. Miscellaneous:

1. Cable ties shall be Velcro with a loop strap. Nylon cable ties shall not be used. If they are they shall be black and strapped with a loose tie so as not to pinch the cable sheath and with enough slack to get snips and fingers between tie and cable. The end of the tie shall be cut off after strapping.
2. Labels for patch panels, faceplates, and cables shall be by one manufacturer. Ex: Label Ware, EasyMark, Brady, LabelMo, etc.
3. All conduits shall have a maximum fill ratio of 60%.
4. All labels including the cable label shall be laser printed.
5. Labeling (Wire and Wall Jacks): All Labeling shall follow the "Tracy U.S.D. Labeling Format" (See "Tracy U.S.D. Labeling Format" Spreadsheet) with exception of workstation cables (i.e. patch cords). Hand written labels are not acceptable. All labels shall be machine printed black lettering on opaque white tape, stenciled onto adhesive labels, or type written onto adhesive labels. The font shall be at least one-eighth inch (1/8") in height, block characters, and legible. Patch panels shall be assembled and terminated in a sequential order, exhibiting room and workstation numbers for all workstations served by the MDF or IDF.

DATA COMMUNICATIONS
SECTION 27 1000
3595001000

6. Each fiber optics cable segment shall be labeled at each end with its respective IDF identifier. Each fiber interconnect device shall be labeled with its respective IDF identifier.
7. Each telecommunication outlet shall be labeled with its respective workstation number respective (machine labels only).
8. Workstation Terminal Outlets are to be installed within single-gang or double-gang electrical boxes. No mud-rings are to be used. WAO faceplates are to have labeling which identifies connected IDF.
9. Each copper backbone cable shall be machine labeled and printed EIA/TIA-606 Section 8 compliant only at each end with its respective IDF number/letter. Each binder group shall be tied off with its respective identifying ribbon at each breakout point.
10. Labeling will be completed before testing shall begin; discrepancies during inspection with the labeling will void all test results.

2.4 PROJECTOR

1. Contractor shall furnish and install Epson Brightlink 1485Fi and associated Epson Pilot control pad.

PART 3 - EXECUTION

3.1 SYSTEM SPECIFIC INSTRUCTIONS

A. Horizontal Cable:

1. Contractor shall label cables in 2 locations 12" apart.
2. Contractor is to terminate using the 568B pin out.
3. Contractor is to leave 10 feet of slack for all cables at the station in the accessible ceiling.
4. All cables will terminate at the stations with RJ45 connectors and shall be housed in a faceplate. If the connector is in the ceiling or behind a faceplate (such as the AV control panel) the connector shall be installed in a surface housing.

B. Closet/Rack:

1. All cables will terminate on the rack on a modular patch panel with an RJ45 connector.
2. A horizontal manager shall be installed above and below every 48 ports of patch panels (CPPL48WBLY) and switches.
3. A service coil shall be created above the rack on the wall of the closet. Do not place a service coil within the vertical and horizontal wire management. Cables within those managers shall be kept straight with proper bend radius.
4. The service coil shall be long enough to reach the farthest corner of the room and then down to the floor.
5. Patch frames shall be rack mounted using grounding screws and washers.

6. Note: unused ports on the patch frames are to be filled in with black blank inserts. Also, 1-2 blanks will be installed after each student data, teacher, admin, ceiling, and paging outlet with less than 4 cables to allow for future MACs.
7. Contractor shall place a drawing next to the data rack showing a floor plan with outlet locations and labels that match the rack labels. These drawings are to be laminated or in a plastic casing.

3.2 INSTALLATION PROCEDURES

- A. The following are installation practices that ensure superior performance and aesthetics.
- B. NOTE: References to conduit, raceway and electrical are for contractor's information. Actual installation of these components is included in another specification. If contractor notices a difference between actual install and the specs below, the contractor shall bring that immediately to the attention of the electrical engineer.
- C. Work Area Outlet
 1. The 10 ft coil shall not be a traditional service loop. Rather, the cable shall be extended along the wall then brought back at a lower height.
 2. A pull string for MACs shall be pulled with cable into accessible ceiling space or length of conduit. *Label strings to indicate destination of conduit.*
 3. Fill and label faceplates starting in the top left then moving right and downward.
 4. In addition to labeling, jacks shall be quickly identifiable by the following color:
 - a. Paging Jack Blue
 5. All jacks are to be terminated using 568B pin assignment.
 6. Minimize the amount of untwisting in a pair as a result of termination to connecting hardware. The amount of twisting shall not exceed 1/2" for category 6 and higher cables. Cable sheath shall touch the back of jack after termination (leave no portion of the cable exposed).
 7. A classic series faceplate (or surface mount box if needed) with a label window shall be used or the Jack itself labeled (Easy Mark #PLL-46-Y3C-1 or equal).
 8. The cable behind the faceplate shall also be labeled to match faceplate.
 9. ALL labels are to be machine generated, laminated, and adhesive.
 10. Each faceplate shall be labeled with its respective workstation number.
- D. Cable Pathways
 1. Acceptable Pathways:
 - a. All horizontal cable shall have support, the cable shall never be lain freely and resting on structural supports nor shall they use ceiling grid or lighting support wires.
 - b. The pathway to the work area shall allow for a minimum of 3 cable runs per individual work area.
 - c. Pathways shall ensure that a maximum pulling tension 25 lb-f is not exceeded and pathways (or installers) shall not deform the cable jacket. *If cable becomes kinked, contractor shall replace the cable.*

DATA COMMUNICATIONS
SECTION 27 1000
3595001000

- d. Acceptable pathways are: cable tray, j-hooks, conduit, and surface mount raceway. No floor mounted boxes.
- 2. J-hooks - responsibility of cable installer
 - a. Cables shall not be attached to ceiling grid or lighting support wires. Instead cable pathway shall be along walls. Cables shall never cross a room. The pathway shall always be along a wall. This makes for easier MAC as any tile next to a wall can be moved to access.
 - b. For large quantities of cables (50 to 75) that converge at the TR and other areas, provide cables trays that are specifically designed to support the required cable weight and volume. When more than 50 cables are in a pathway j-hooks shall not be used or a second pathway shall be created. (NOTE: It is recommended that no more than 25 UTP Cat6 cables be placed in a single J-hook).
 - c. If cable tray is used follow manufacturer guidelines for installation and use a product that is designed specifically for communications cabling. The depth of the tray shall not exceed 4".
 - d. When using J-hooks, locate them staggered between 4 ft to 5 ft to adequately support and distribute the cable's weight. Do not evenly space the hooks, vary between 4 to 5 feet between each hook to prevent signal disruption.
 - e. When using J-hooks install cable with a wheel pulley system that will remove after cable is in place.
 - f. Contractor shall not strap the cables in between hooks to enable easier MACs and to lessen possibility of alien crosstalk.
- 3. Conduit
 - a. When pulling through conduit, cable pulling lubricants shall be continuously applied to all cables and be specifically approved by the cable manufacturer.
 - b. Pull string shall be installed in conduit to allow future MACs. If more than one string is installed in a conduit, the strings shall be labeled for identification of destination.
 - c. Conduits shall have grommets on end to protect the cable.
 - d. No more than (2) 90 degree turns in a given length
- 4. Fill capacities
 - a. Cable pathways shall not be filled greater than the NEC maximum fill for the particular pathway type.
 - b. The fill cable capacity for conduit shall not exceed the following and be no more than 60% full:
 - 1) ½ " 0 – Do not use
 - 2) ¾ " 0 – Do not use
 - 3) 1" 4 – Do not use
 - 4) 1 ¼ " 6
 - 5) 1 ½" 8
 - 6) 2 " 12
 - 7) 2 ½ " 16

8) 3 " 24

- c. Fill capacity for raceway: (See Manufacturer Specs and Size by Cat6 requirements or 8.4mm/.33in diameter cable)

5. Distance Limitations

- a. Horizontal cable distance (Outlet to Panel) is not to exceed 298 feet.
- b. Premise cable distance (Outlet to Panel) shall be no less than 55 ft for any cable installed. Coil excess in ceiling if physically closer than 55 ft.

- 6. Aerial cable shall not be utilized.

E. Bend Radius Limits

- 1. The minimum bend radius for copper cable 4x cable diameter which is approximately 1.24 inches (31 mm).
- 2. The minimum bend radius for indoor (ISP) backbone optical fiber when under no load is 10 times the cable diameter and while it is being pulled it is 15 times.

F. EMI Avoidance

- 1. Cabling shall be installed to avoid devices that cause electromagnetic interference, such as Microwaves, Refrigerators, lighting, ballasts, power panels, etc.
- 2. Keep a minimum of 6" from electrical conductor cable.
- 3. Telecommunications conductors shall not be routed closer than 6 ft. from any lightning protection system conductor.

G. Cabinets and Racks

- 1. Only black Velcro cable ties shall be used for bundling and routing. Bundles shall be loose and Velcro ties shall have at least 18 inches between and the bundle shall be loose enough to place two fingers between the cable and the ties.
- 2. The service coil at the rack shall be located above the rack on the ladder rack/cable tray system or on the wall. Do not place the service coil within the vertical and horizontal wire management.
- 3. Entrances to cabinets shall be protected with grommets and shall have a conduit stubbed to ceiling space.
- 4. Installer shall create a detailed floor drawing designating jack locations and labels. A copy shall be attached inside the cabinet or back wall of the rack. The drawing shall also have the date and contractors contact information.
- 5. Installer shall ensure that every telco rack/cabinet shall have separate and individual patch panels for workstation data cabling for each classroom, office or room space. In-addition, separate and individual patch panels shall be installed for each individual system such as: Extron A/V, Valcom IP Paging, Security Surveillance, and Wireless Access Point devices.

H. Wire Management

- 1. When bringing cable into the data rack, keep the bundle size small (optimum size may be 12 cables no more than 24 cables).

DATA COMMUNICATIONS
SECTION 27 1000
3595001000

2. Velcro Ties shall be used in place of cable ties. Do not cinch cables so tightly to deform the cable in any way. It is recommended to leave Velcro ties loose enough to get fingers in between without deforming cable. Velcro ties shall be placed no less than 18 inches from other Velcro straps.
3. Every 48 ports of patch frame shall have its own wire manager below and above (except angled patch frames). The manager shall be d-rings on the front for easy access for MACs. Rear management shall also be used and may be finger style or bar style.
4. In addition to the horizontal managers, the installer shall either install a vertical (WMPVHC45E) Panduit center mounting brackets for the wire managers for vertical management.
5. In addition to binding in Velcro ties, ring runs shall be used for cables run in corners and for drop and rise on walls. These bundles shall be labeled indicating the destination of the bundle (i.e. floor horizontal cables, to TR2, etc.).
6. When cable bundles transition from wall to a floor rack a cable tray or ladder rack shall be utilized. Install brackets on sides to prevent cables from falling off the rack if ladder rack is used.

I. Fire stopping

1. All procedures in this category shall be done in accordance with authority having jurisdiction (AHJ), local codes, CEC, and insurance underwriter's requirements. If a procedure in one of these effects performance, the AHJ shall be alerted immediately in writing.
2. Ensure that materials used are U.L. Listed.
3. For sleeves through ALL walls, EZ Path by Specified Technologies shall be used to ensure a fire stopped pathway on future MAC.
4. Contractor shall put a label per ANSL11A/EIA 569 with warning to not remove, company name and phone number, and date next to each penetration. Contractor shall also place a label stating how many cables can fit within the EZ Path. If initial install fills the firestop, the label shall read "Capacity full — DO NOT ADD CABLES". Do this labeling and take a picture to include in close out docs. Cabling will not exceed 60% fill.
5. If the firestop capacity is filled more than 85% during initial install, contractor shall install an additional EZ Path.

J. Grounding and Bonding

1. All network equipment, shielded cables, patch panels, racks, and tray/ladder rack segments shall be Bonded and Grounded according to TJNEIA 607, BICSI guidelines, CEC, insurance underwriter's requirements, and local code (AHJ). The purpose is to provide a path to ground for all components to ensure personal safety and equipment protection.
2. Ensure that materials used are U.L. Listed.
3. Conduits that contain grounding backbone conductors shall be bonded to the grounding conductor at each end of the conduit. This negates the high impedance choke" effect while the cable carries lightning currents.
4. All racks, trays, and electronics shall be grounded.

5. Contractor shall install on rack an ESD Port Kit on each rack in front and back.
6. The use of aluminum conductors is discouraged in the establishment of grounding scenarios. Aluminum does not provide the lowest resistive path. Additionally, aluminum conductors can become loose from mechanical screw/bolt connections due to vibration from carrying AC current.
7. Panduit's Data Center Grounding Solution and components shall be used. The following components shall be used to form a complete system (see the detailed drawing): Cabinet Grounding Complete Kit, Common Bonding Network Jumper (CBN) Kit, Surge Suppressor Jumper Kit, Front to Back Rail Jumper Kit, Rack Ground Strip Kit, Grounding Bus bar Kit, Paint Piercing Grounding Washers Kit, Thread Forming Screws, and Electrostatic Discharge (ESD) Discharge Port Kit.
8. Contractor shall test the ground system to ensure it has less than 5 Ohms. The test results shall be documented and submitted in close out docs.
9. Documentation: Contractor shall provide a single set of documentation to include test results and Visio "As-built" drawings in both soft copy and hard copy format.
 - a. Workstation Cable: The results of the workstation cable tests shall be provided in the form of printouts from the test equipment as well as computer file copies on CD with the software to read the results included. Test results shall be in PDF format.
 - b. As-Built Drawings: Contractor shall produce drawings depicting data outlet locations as they are actually installed. The drawings shall indicate actual cable routing, work station locations and workstation numbers, to be submitted before final inspection for punch list. Incorrect Visio drawings are punch list items and are to be corrected before re-inspection. "Tracy Unified School District's Telecommunications Jack Legend" shall be applied to all drawings. Results shall be returned to ISET within 30 days.

3.3 TESTING

- A. Testing shall be done with a Fluke Level IV cable tester (DTX 1800 meets this specification) and an Optical Time-Domain Reflectometer (OTDR). The new Fluke DTX 1800 unit is one test set that is capable of testing all frequencies through 900 MHz. If another manufacturer provides this test, contractor shall submit spec sheets and receive written approval for the tester prior to testing.
- B. Contractor shall ensure that the tester has been manufacturer calibrated within nine months of testing and has the latest software version downloaded.
- C. Prior to testing, the tester shall be set for the specific cable and jack used on the project.
- D. A summary test report shall be submitted as well as detailed reports for each cable.
- E. All test results shall have the individual cable label and project name in the header along with the date and time of testing.
- F. Test results shall clearly indicate a Pass or Fail on the report. If a cable fails in one parameter the test is considered a Fail. Marginal Pass cables (indicated with an asterisk) are not acceptable and will be considered as a Fail.

DATA COMMUNICATIONS
SECTION 27 1000
3595001000

- G. Any cable damaged or exceeding recommended installation parameters during installation shall be replaced by the contractor prior to final acceptance at no cost to the Owner.
- H. Test reports shall show a pass result for network standards, continuity, length, cross-talk, attenuation, and ambient noise.
- I. No Splices will be accepted.
- J. An optical time domain reflectometer (OTDR) test will be required on the existing fiber pathways prior to the work commencing and on conclusion of the work. District IT will provide final acceptance of the OTDR test results and sufficiency.

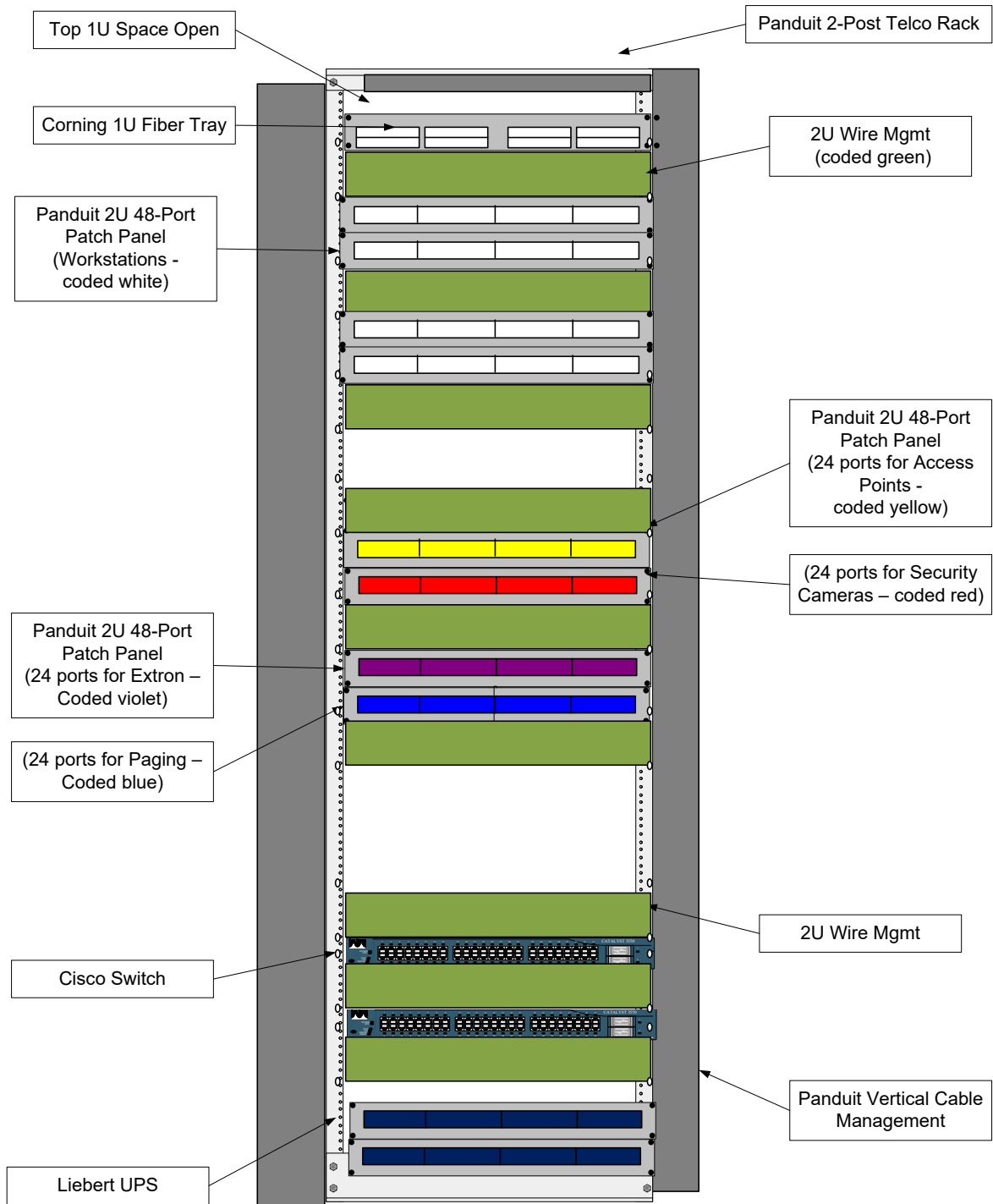
3.4 EXAMINATION /FIELD QUALITY CONTROL

- A. On a daily basis, the contractor's project manager shall inspect the installation to ensure that installers are following the specifications and quality craftsmanship.
- B. Throughout the project regular interval inspections will be completed by an architect representative to eliminate "unchangeable" installations.
- C. If the representative inspects the site and makes a change to the design or installation, this shall be noted in writing. The contractor shall not complete this change until approval is given.
- D. After installation, the architect representative will first inspect the site and create a closeout punch list for contractor to complete.
- E. After completion, the representative and contractor will inspect the site together.

3.5 IDENTIFICATION

- A. The labels are to be laser printed onto adhesive labels using software and labels by Label Ware, Easy Mark, Brady, LabelMo, etc.
- B. Each cable is to be labeled using the following pattern: XXX-A##
 - 1. Segment XXX: Designates the location where the other end of the cable is. That is, at the station it says what room the patch panel is, and at the patch panel it says what room the station is.
 - 2. Segment A: Designates which patch panel the cable is terminated. This allows 26 patch panels per closet.
 - 3. Segment ##: Designates which port on the patch panel the cable is terminated.
- C. Segment A and ## shall be the same on both sides of the cable.
- D. Contractor is to place labels onto the faceplates and panels. In addition, contractor shall place an adhesive label on each end of the cable.
- E. Layout of an IDF rack (*not to scale*). Rack height shall be 72".

**DATA COMMUNICATIONS
SECTION 27 1000
3595001000**



F. Labeling Format

1. All data cables at both the patch panel and the data jacks shall be labeled using the following standard labeling format. The labels are to be laser printed onto

DATA COMMUNICATIONS
SECTION 27 1000
3595001000

adhesive labels using software and labels by Label Ware, Easy Mark, Brady, LabelMo, etc.

2. Telecommunication outlets for a Valcom IP Paging horn, speaker or clock/speaker shall be labeled with its respective Valcom IP device number (machine labels only). Valcom numbers shall be comprised of the room number (i.e. C1, C2, etc.) and Valcom IP device number/drop number (i.e. PA1, PA2, etc.). Each data cable at a telecommunications outlet shall have an alpha identifier for the data jack (i.e. A). No biscuit shall be used and the data jack should be placed inside the Valcom back box. The labeling will start from the main door entering the room and go clockwise around the room. Each workstation cable shall be neatly labeled at each end with its respective workstation number.
3. Labeling for the respective port on the MDF/IDF patch panel shall be:
 - a. C1 – PA1 – A

3.6 CLEANING

- A. All work shall be cleaned to remove all dust, dirt, grease, paint or other marks. All electrical equipment shall be left in a clean condition inside and out, satisfactory to the owner. Keep buildings and premises free from accumulated waste materials, rubbish and debris resulting from work herein, and upon completion of said work, remove tools, appliances, surplus materials, waste materials, rubbish debris, and accessory items used in or resulting from work and legally disposed of offsite. For lead and asbestos dust removal, refer to "Safe School Standards" documentation.

3.7 CLOSEOUT

- A. The contractor will submit to owner within thirty days of completion a closeout package containing:
 1. Hard copy and electronic test results.
 2. Hard copy and electronic as-built drawings with labels (with extra copies to be posted in the E.R. and T.E.s).
 3. Warranty information and manuals.
 4. A bill of materials with part numbers to be used for later MAC.
 5. Hard copy and electronic pictures.
- B. As prerequisite to final acceptance, supply to the owner certificates of inspection from IOR and owner designated RCDD.

- END OF SECTION -

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. Furnish and install new analog devices into existing Analog Sound/Communications System and Analog Clock System, including all wiring and connections and other materials as shown on Plans and specified herein. It is the intent that complete operating systems be installed and that any power supplies, transformers, modules, cards, cages, programming, or other items required to achieve this end result shall be furnished whether or not such item or items are specified herein.
- B. School Application analog equipment supplied by Rauland-Borg, Inc. shall be considered as meeting all specification requirements.
- C. The system shall provide distribution of intercom, overhead paging, emergency paging, class change time tones and emergency tones.
- D. System shall be UL 813 and FCC Part 15 listed for safety reasons. Systems not listed are not acceptable.
- E. Site and System Investigation: Sound/Communications System bidder shall visit site prior to bid and become thoroughly knowledgeable about existing system and work required to perform work of this section. Failure to discover the equipment, materials, and labor required to complete the extensions will not relieve the contractor from completing the work at no additional cost. Existing system is Rauland ICS legacy system, and all devices shall integrate with existing system.

1.2 GENERAL REQUIREMENTS

- A. System Requirements: All of various equipment components to be complete with all appurtenant accessories required to provide specified facilities and perform specified functions throughout presently planned construction and space; and provisions for expanding system to provide same facilities, and perform same functions in all future planned construction, including space and mountings in consoles and terminal backboards.
- B. Equipment Tests and Standards:
 - 1. For all equipment operating at 26 volts or more, or utilizing over 50 watts, Contractor to submit proof within time allowed for submittals that all items of equipment will conform to requirements of U.L. Label or listing of equipment by U.L. to be accepted as evidence of conformance.
 - 2. For all items of equipment operating at 25 volts or less, and utilizing less than 50 watts, Contractor may submit, in lieu of such label or listing, written certificate from any nationally recognized testing agency, adequately equipped and competent to perform such services, that each item has been tested and conforms to U.L. standards, including method of test of U.L.
- C. Instructions and Manuals:

SOUND AND COMMUNICATIONS

SECTION 27 5123

3595001000

1. Equipment supplier of systems to demonstrate operation of systems to satisfaction of Owner and furnish Owner three (3) wiring schematics for all items of equipment, installation instructions, and details of all routine maintenance and servicing which must be given systems by Owner. Manuals shall be provided in 3-ring binders, with title page, list of contents, and conspicuous label on cover and shall be delivered to District. Submit copy to Architect for approval before delivering to Owner.
2. Supplier shall demonstrate operation of systems and provide training to all end users, administrative staff, and system administrator. Coordinate times of instruction with District, at District's convenience. Supplier shall provide a minimum of 2 hours of user instructions to clerical staff and 4 hours of user/maintenance instructions to District maintenance personnel. Instruction periods shall not coincide and shall be scheduled with District, not school staff. District shall provide list of authorized personnel for training sessions.

D. Submittals:

1. Refer to Section 27 1000.
2. Contractor shall submit name of firms he proposes to do work under this Section, addresses, phone numbers, and name of firm's contact, for approval. Such firms shall be factory authorized representatives of the existing system and submittal shall include manufacturer's letter of confirmation. Proposed firm shall furnish all equipment and specialty cables, make all connections to same, and place the systems in operation. Such firms shall have offices and service departments within a 100 mile radius of project and shall have been in business of this type for at least five years.

E. Record Drawings:

1. Final Inspection will not be made until drawings are received and approved. Record Drawings shall include "As-Built" one-line and wiring diagrams, with terminations identified, wire color coding schedule, pullbox locations, and conduit routing plans.
2. The Contractor shall provide complete drawings detailing all interconnections and panel wiring diagrams in Visio 2000 format.

F. Guarantee:

1. One firm to assume full responsibility for performance on all work of this section. Guarantee all equipment against defects in material and workmanship for two (2) years, and provide on-the-premises service during normal working hours for two years, at no cost to Owner if trouble is not caused by misuse, abuse, or accident, or at current labor rates if so caused. Provide manufacturer's written one-year guarantee for equipment and parts to Owner.
2. Service shall normally be available within 24 hours from service department of authorized distributor of manufacturer by factory trained servicemen.
3. On-the-premises service at other than normal working hours to also be available, but labor charges for such calls to be paid by Owner at current labor rates.

PART 2 - DETAIL REQUIREMENTS AND PRODUCTS

2.1 SOUND/COMMUNICATIONS SYSTEM

- A. General: Install new analog devices into existing Analog Intercommunications System.
- B. Verify existing server is provided and programmed.
- C. Equipment Standards:
 - 1. All enclosures for all equipment to be of metal throughout system. Enclosures other than metal are not acceptable.
 - 2. Speaker grilles to be non-directional diffusion type insulated from speaker by fiber mounting board. Dampening material to be installed between mounting board and grille to prevent metallic resonance.

2.2 SYSTEM CABLING

- 1. Each clock and speaker shall be wired to signal terminal cabinet located nearest to new building, and integrated into existing clock and speaker communication systems.
- 2. Exterior speakers: one 20 AWG shielded twisted pair
- 3. Interior speakers: one 18 AWG shielded twisted pair
- 4. Clock: 2-wire, 12 AWG unshielded

2.3 REMOTE EQUIPMENT

- 1. Existing system: Rauland ICS legacy system. Provide compatible equipment. All of various equipment components to be complete with all appurtenant accessories required to provide specified facilities and perform specified functions throughout presently planned construction and space; and provisions for expanding system to provide same facilities, and perform same functions in all future planned construction, including space and mountings in consoles and terminal backboards.
 - a. Outdoor Speakers: Provide surface mount backbox and vandal resistant enclosure
 - b. Interior Speakers: Provide square faceplate and recess mount backbox.
 - c. Clock: Provide 12", analog clock and recess mount backbox. Coordinate if existing spare clocks can be provided by the district.

PART 3 - EXECUTION

3.1 INSTALLATION REQUIREMENTS

- A. Electrical Contractor shall retain the services of the duly appointed representative as specified hereinbefore, who shall furnish all equipment, make all connections to same, and place system in operation. Technician and workman employed shall be particularly

SOUND AND COMMUNICATIONS
SECTION 27 5123
3595001000

skilled in this type of work. Workmanship on installed systems shall be of professional quality, best commercial practice.

- B. All wiring throughout entire system shall be installed in conformance with standard industry practice.
- C. Station locations shall be identified by location and school's actual room numbers as furnished by District, and in all ways shall relate as closely as possible to record wiring drawings. Prior to performing final labeling and programming, coordinate information with District.

3.2 CONSTRUCTION MEETINGS

- A. The Contractor shall schedule construction meetings at the jobsite as follows:
 - 1. Prewire meeting shall occur after raceways are installed and prior to pulling of any wire or cable.
 - 2. Pre-termination meeting shall occur after wire and cable has been installed and prior to termination.
- B. Meetings shall be scheduled by the Contractor on a building by building basis and shall include the Project Inspector, School's Representative, the electrical subcontractor, and the Signal System subcontractor as a minimum.

3.3 TESTS

- A. After all equipment specified herein has been installed and is in operating condition, performance tests shall be conducted to determine that installation and components comply with these specifications. Contractor shall furnish competent personnel for these tests.
- B. Perform initial programming of system and audio level adjustments.
- C. Contractor shall physically walk to each speaker and ensure that sound is coming from each speaker.
- D. Contractor shall set the volume level to approximately 6 dB above ambient noise during occupancy.
- E. The sound level for each speaker and zone shall be tested with an audio meter.
- F. Contractor shall provide a drawing showing dB levels for each speaker and zone. The drawing shall be dated and signed by the person administering the test.
- G. Contractor shall test the extension for each room. Extension also be noted on the drawings.
- H. Testing shall be scheduled with the Owner and shall occur after receipt by Architect of Contractor's written certification of completion, record one-line diagram, wiring diagrams, maintenance and operation manuals, and other "As-Built" data required by these specifications. Tests shall be scheduled with School before occupancy occurs.

- END OF SECTION -

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. Furnish and install extensions to the existing Intrusion Alarm System including all wiring and connections and other materials as shown on Plans and specified herein. It is the intent that a complete operating system be installed and that any power supplies, relays, resistors, cards, modules, programming, or other items required to achieve this end result shall be furnished whether or not such item or items are specified herein.
- B. Site and System Investigation: System bidder shall visit site prior to bid and become thoroughly knowledgeable about existing system and work required to perform work of this section. Failure to discover the equipment, materials, and labor required to complete the extensions will not relieve the contractor from completing the work at no additional cost.
- C. Proprietary Systems: Where school is protected and monitored by a proprietary system, such as ADT or Sonitrol, Contractor shall coordinate the exact requirements with those firms. If the Division 16 Contractor elects to use a sound and signal firm other than the proprietary company, the sound and signal firm must include in bid, the materials, equipment, and labor required by the proprietary company to make the extensions complete and fully functional.

1.2 GENERAL REQUIREMENTS

- A. System Requirements: All of various equipment components to be complete with all appurtenant accessories required to provide specified facilities and perform specified functions throughout presently planned construction and space; and provisions for expanding system to provide same facilities, and perform same functions in all future planned construction, including space and mountings in control panels and terminal backboards.
- B. Interruption of Service: Existing intrusion alarm system must be kept operational during unoccupied hours. In the event that the system or portion of system is nonoperational during off-hour periods as a result of work of this contract, the Contractor must provide guard(s) to patrol the campus. Guard(s) and guard duties proposed by Contractor must be acceptable to District and District Police (local enforcement if District does not have its own Police Services). All costs for security guard(s) shall be Contractor's responsibility.

1.3 QUALITY ASSURANCE

- A. Work shall be performed in accordance with all applicable requirements of the edition indicated on the drawings of all governing codes, rules and regulations including but not limited to the following minimum standards, whether statutory or not:

INTRUSION ALARM SYSTEM
SECTION 28 3100
3595001000

1. California Electric Code (CEC)
2. California Fire Code (CFC)
3. National Fire Alarm Code with California Amendments (NFPA 72)
4. Title 3 of the Americans with Disabilities Act
5. Titles 19 and 24 of the California Code of Regulations

1.4 CONTRACTOR QUALIFICATIONS

- A. Fabricator/Installer/Vendor shall be licensed contractor and servicing agent, as well as installer for all components and systems in this System, and be acceptable to manufacturer of the major components of the system. Service personnel shall be capable of serving any and/or all components of the System.
- B. Fabricator/Installer/Vendor must be able to present evidence of technical expertise, be a firm who has successfully installed projects of a similar scope to this project for a minimum of five (5) years, and shall maintain service office within 100 miles of the project site.
- C. All equipment is to be manufactured by a firm/firms who have successfully fabricated elements/systems of a scope similar to this project for a minimum of ten (10) years.
- D. Have a valid State of California Contractor's license in classification C10 - Electrical.
- E. Provide authorized dealer service on-site at facility within four (4) hours of a problem being reported, with this response time available twenty-four (24) hours per day, seven (7) days per week.
- F. Affirm that he maintains, or will maintain, or has access to, a stock of system spares sufficient to ensure that no element of the System will be out of service for more than twenty-four (24) hours due to lack of proper spares.

1.5 SUBMITTALS, O&M'S AND RECORD DRAWINGS

- A. Submittals:
 1. Contractor shall submit name of firm he proposes to do work under this Section, addresses, phone numbers, and name of firm's contact, for approval. Such firms shall be factory authorized representatives of the system and submittal shall include manufacturer's letter of confirmation. Proposed firm shall furnish all equipment and specialty cables, make all connections to same, and place the systems in operation. Such firms shall have offices and service departments within a 100 mile radius of project and shall have been in business of this type for at least five years.
 2. Submittals shall be complete and include catalog data, shop drawings, one-line diagrams, battery calculations, voltage drop calculations, and scaled plan

drawings. Building plans shall be 1/8"=1'-0", and site plans shall be no smaller than 1"=40'.

3. Shop Drawings shall contain complete wiring and schematic diagrams for equipment furnished, equipment layout, conduit and wiring layout drawings, and any other details required to demonstrate that system has been coordinated and will properly function as a unit. Equipment Vendor shall check Drawings for adequacy of conductors and raceways for proposed system. Include in Bid Amount all required raceways, conductors and material necessary to suit proposed system.

B. Operation and Maintenance Manuals:

1. Operating Instruction Manuals outlining the step-by-step procedures required for system start-up and operations shall be furnished. The instructions shall include manufacturer's name, model number, service manual parts list, and brief description of all equipment and their basic operating features.
2. Maintenance Instruction Manuals outlining maintenance procedures shall be furnished. The manual shall include a troubleshooting guide listing possible breakdowns and repairs and a simplified connection wiring diagram for the system as installed.

C. Record Drawings: Final Inspection will not be made until drawings are received and approved. Record Drawings shall include "As-Built" one-line and wiring diagrams, with terminations identified, wire color coding schedule, pullbox locations, and conduit routing plans.

D. Furnish to District a printed copy of the control panel programming upon completion of final system programming.

E. Performance Test Reports: Upon completion of installed system, submit in booklet form all field tests performed to prove compliance with the specified performance criteria. Each test report shall indicate the final position of controls.

1.6 TRAINING

- A. Supplier shall demonstrate operation of systems and provide training to all end users, administrative staff, and system administrator. Coordinate times of instruction with District, at District's convenience. Supplier shall provide a minimum of 1 hour of user instructions to clerical staff and 2 hours of user/maintenance instructions to District maintenance personnel. Instruction periods shall not coincide and shall be scheduled with District, not school staff. Deliver to Owner at time of demonstration, all settings and codes programmed into system. Furnish three copies on manufacturer's standard programming worksheets. District shall provide list of authorized personnel for training sessions.

**INTRUSION ALARM SYSTEM
SECTION 28 3100
3595001000**

1.7 GUARANTEE

- A. One firm to assume full responsibility for performance on all work of this section. Guarantee all equipment against defects in material and workmanship for two (2) years, and provide on-the-premises service during normal working hours for two years, at no cost to Owner if trouble is not caused by misuse, abuse, or accident, or at current labor rates if so caused. Provide manufacturer's written one-year guarantee for equipment and parts.
- B. Service shall normally be available within 24 hours from service department of authorized distributor of manufacturer by factory trained servicemen.
- C. On-the-premises service at other than normal working hours to also be available, but labor charges for such calls to be paid by Owner at current labor rates.

PART 2 - DETAIL REQUIREMENTS AND PRODUCTS

2.1 SYSTEM OPERATION

- A. Activation of an intrusion alarm sensor shall cause a signal to be transmitted to a Central Station via telephone lines. Signal transmission shall be initiated by a built-in dialer unit. In addition to alarm reporting, system shall report trouble, low battery, and shunted zone indications.

2.2 SYSTEM DESCRIPTION

- A. Existing control panel shall be examined to provide the following features:
 - 1. The DACS control panel shall be Bosch Security Systems, Inc. model B9512G comprising a fully integrated intrusion and residential fire control system. The control panel shall support the following:
 - a. The DACS system is capable of being utilized as a combination Intrusion and Commercial Fire system per code. Fully integrated intrusion and fire functions allow users to interface with 1 system instead of 2
 - b. Optional Telephone Line Module, programmable for signaling and supervision.
 - c. Integrated Conettix IP based communication provides high-speed, secure alarm transport and control.
 - d. 32 programmable areas with perimeter and interior partitioning.
 - e. 8 on-board, hardwired points with expansion capability for a total of 599 using a combination of wired or wireless points.
 - f. Compatibility with Color Graphic Touch Screen, 2-line alpha numeric capacitive touch, ATM style LCD or 2-line LCD style Alarm Keypads.

- g. Local or remote programming, test, and diagnostic capability via a computer running the Remote Programming Software (RPS).
 - h. The system shall include an integrated USB port for local programming and diagnostics using a computer running Remote Programming Software (RPS) and a male USB2.0 to male USB 2.0 cable with no additional hardware modules required.
 - i. The system shall support the use of an Apple iOS device and/or Android device for control. Functions to include arming, disarming and control of outputs and access door, viewing of connected IP cameras. This application shall connect directly to the DACS using internet, wifi or cellular communications and shall not require a third party server or network operations center (noc).
 - j. The DACS will allow integration with up to 16 Bosch IP video cameras using the built-in Ethernet connection, allowing the cameras to act as inputs and outputs.
 - k. The DACS shall support integration with the Bosch Video Management System (BVMS) using the built-in Ethernet adapter.
 - l. The DACS shall support up to thirty-two (32) custom functions allowing the installer to combine up to 6 functions into one command. These custom functions shall be operated by keypad command, point activation, keyfob button, or programmable schedule
 - m. The DACS shall support up to 32 keypad shortcuts which allow the installer to define which commands are available at each keypad.
 - n. The DACS shall support flash firmware upgrades of systems firmware for the control panel and peripherals, allowing for future updates.
 - o. Integrated real time clock, calendar, test timer and programmable scheduling capability for relay control and automatic execution of system functions based on a time / event.
 - p. Provide 1.4 amps of power for standby operation and 2.0 amps of alarm power, both rated at 12 VDC.
 - q. 3 configurable form 'C' wet or dry-contact relay outputs with expansion capability for up to an additional 472 dry-contact relay outputs.
 - r. Integrated battery charger with reverse hook up protection, battery supervision and battery deep discharge protection.
 - s. Supervision of peripheral devices and communications interface(s).
- B. Point Functionality and Expansion:
- 1. The system shall support a programmable Monitor delay functionality for supervision of points during disarmed periods. These points may be programmed to ignore status from 1 to 60 minutes and will activate only if the point is off-normal for this time period.

INTRUSION ALARM SYSTEM
SECTION 28 3100
3595001000

2. The system shall support a programmable delay response functionality for supervision of points during armed or disarmed periods. These points may be programmed to ignore status from 1 to 60 minutes and will activate only if the point is off-normal for this time period.
3. The system shall support virtual points and outputs for customized programming of events
4. The DACS shall be capable of supporting "group zoning." Group zoning refers to the combining of points into a separately identifiable and separately annunciated (programmable text) areas.
5. The DACS shall be capable of allowing variable point response times via programming. Point response times shall be programmable over a range of 300 milliseconds to 4.5 seconds.
6. The DACS shall have the capability to expand up to 599 separately identifiable points, of which 8 are on-board and 472 are off-board wired, addressable or wireless points.
 - a. The 8 on-board points shall be able to accommodate powered class B functionality using a powered loop interface module.
 - b. Point Expansion Modules (Wired and Wireless) shall be able to be located remote to the main panel to a maximum distance of 1000 feet.
 - c. Addressable modules shall be able to be located remote to the panel to a maximum of 500 feet.

C. Areas/Accounts:

1. The DACS shall support 32 independent areas. Each of the 32 areas shall have custom text associated with the armed state, disarmed state and point-off-normal state.
2. The DACS shall be capable of assigning 1 to 4 account identifiers to the areas depending on the distribution of areas per account.
3. The DACS shall be capable of assigning 1 to 2 account identifiers to the areas depending on the distribution of areas per account.
4. All of the areas must be capable of Master (All) and/or Perimeter (Part) arming (excluding predefined Interior protection).
5. The DACS shall be capable of logically grouping 1 or more points into an area, or conversely, dividing 2 or more points into two or more areas.
6. Any area shall be configurable to allow arming by specific users when a programmable number of devices are faulted or bypassed.

7. Area(s) shall accommodate assignment of independent account numbers to define annunciation, control, and reporting functions.
 8. The DACS shall be capable of linking multiple areas to a shared area which may be automatically controlled (hallway or lobby).
- D. Output Relay Expansion: The DACS shall provide the capability for output relay expansion using relay expansion modules. Independent control of relay functions by area shall be possible through programming assignments.
1. The DACS shall be capable of activating 472 additional relay outputs for auxiliary functions based on its classifications (area vs. panel wide). Output Expansion Modules shall be able to be located remote to the main panel to a maximum distance of 1000 feet. 8 relays (Form C) are to be provided per octo-relay module
 2. The DACS shall be capable of activating 64 additional relay outputs for auxiliary functions based on its classifications (area vs. panel wide). Output Expansion Modules shall be able to be located remote to the main panel to a maximum distance of 1000 feet. 8 relays (Form C) are to be provided per octo-relay module
- E. Alarm Keypads:
1. The DACS shall accommodate connection with up to 32 ACCs, each capable of displaying custom English, Latin American Spanish, Portuguese, Canadian French, Hungarian, Greek, Italian, Polish, German, Dutch, Swedish and/or Chinese text on a liquid crystal display.
 2. The Alarm Keypads shall accommodate viewing and configuration of system parameters including:
 - a. Network Parameters
 - b. Point Parameters
 - c. Event Routing Parameters to allow programming of up to 4 report routing groups as well as configuration of primary and secondary paths.
- F. User Passcodes and Authority: Passcodes shall be programmable with authority levels to allow users to operate any or all areas.
1. Up to 2000 different passcodes shall be accommodated
 2. Up to 500 different passcodes shall be accommodated.
 3. Each passcode shall be 3 to 6 digits (variable) and be assigned a 32-character user name

INTRUSION ALARM SYSTEM
SECTION 28 3100
3595001000

- G. Access Control: THE DACS shall support access control using the B901 access control module(s).
- H. Communication: The DACS shall be capable of reporting system events and supervisory reports including alarm, trouble, missing modules, restorals, system status, AC failure, battery status to primary and secondary off-site DACR's. The following features shall be supported.
 - 1. The DACS shall be capable of communicating via dial-up analog telephone lines, over a LAN/WAN/Internet using a wired network interface module, or over a cellular network.
- I. Network Communication: The DACS shall be capable of network communications over a LAN, WAN, Intranet, or the Internet. The system shall include supervision of the network communication utilizing configurable periodic heartbeats to the Digital Alarm Communications Receiver (DACR). The DACR shall provide notification of the loss of communications from a networked system after a programmable timeframe since the last communication. The notification options shall be programmable and include local annunciation or indication to automation software.
- J. Event Log: The DACS shall maintain a log of events indicating time, day, month, year type of event, account number, area number, user ID, point text, user text and primary/secondary event route. The system shall allow the following characteristics:
 - 1. The DACS shall be capable of storing up to 10,000 events
 - 2. The DACS shall support viewing of logs locally at the ACC and remotely via an upload to a remote central station computer running the RPS software.
 - 3. The DACS shall provide notification via a report to the DACR when the event log reaches a programmable "percent full capacity". This allows retrieval of stored events via RPS to prevent any loss of event history.
- K. Testing, Diagnostic, and Programming Facilities: The DACS shall be capable of sending (manually or automatically) test and status reports to remote DACRs.
- L. Miscellaneous Features: Programmable alarm output timer, 4 programmable entry delay times, exit delay programmable by area, individually programmable point of protection text, point bypassing, key switch arming capability with LED outputs, and fire verification.
- M. False Alarm Reduction: The DACS shall comply with all ANSI SIA CP-01 2010 requirements for false alarm reduction
- N. Ambush Detection: The DACS shall include an early ambush feature that requires that the user disarm, and then inspect the facility within a specified time period, before

entering their passcode or a different authorized passcode again. If the user does not enter a passcode a second time, a duress event is generated. If the user does enter a passcode within the specified time period, the system disarms.

2.3 MANUFACTURER

- A. Acceptable Manufacturer: North America: Bosch Security Systems, Inc.; 130 Perinton Parkway; Fairport, NY 14450. ASD. Toll Free Tel: 800-289-0096. Tel: 585-223-4060. Email: request info (presales.support@us.bosch.com). Web: www.boschsecurity.us.

2.4 SYSTEM PERFORMANCE

- A. Voltage Triggers: System shall provide voltage triggers, which change state for different conditions. Used with devices such as a remote keypad sounder or keyswitch ARMED and READY LEDs.
- B. Audio Alarm Verification Option: Provides a programmable Audio Alarm Verification (AAV) option that can be used in conjunction with an output relay to permit voice dialog between an operator at the central station and a person at the premises.
- C. Cross-Zoning Capability: Helps prevent false alarms by preventing a zone from going into alarm unless its cross-zone is also faulted within 5 minutes.
- D. Exit Error False Alarm Prevention Feature: System shall be capable of differentiating between an actual alarm and an alarm caused by leaving an entry/exit door open.
- E. Built-in User's Manual and Descriptor Review: For end-user convenience, the control panel shall contain a built-in User's Manual.

2.5 COMPONENTS

- A. Equipment and accessories furnished under the terms of these specifications shall be the standard products of the manufacturers specified or required. All equipment shall be listed by U.L. All equipment and accessories shall be compatible with the system.
- B. System Integration: System shall integrate with facility doors, windows, and departments. The system shall also integrate with external systems, such as building appliances and building alert systems for remote control and central collection of external system alerts. When integrated with external systems, the system shall connect to the external system to receive status changes by way of a dry contact output from the external system. The system shall use its user interface to provide local status messages from external systems, providing for the initiation of local building policies. Optionally, the system may transmit information to an off-site monitoring service to provide initiation of remote policies when appropriate. The installer shall follow manufacturer's instructions when installing and programming system equipment.

INTRUSION ALARM SYSTEM
SECTION 28 3100
3595001000

1. Zone Input: System zone inputs allow the system to sense the change in state of an output from an external device, such as a door/window position sensor, a motion detector, a relay output from an appliance, the output of an external alert system, or other devices that provide a dry closure output.
 2. Door Contact: Bosch ISP-MCS2-FP110 surface mount sensor.
 3. Motion Detector, Wall-Mounted: Bosch ISC-BDL2-WP12G Dual-Tec Motion Detector.
 4. End of line resistors, as required.
- C. Wiring: The contractor shall provide cables consistent with the manufacturer's recommendations. The following general guidelines shall be followed for wiring installation:
1. Wiring shall be appropriately color-coded with permanent wire markers. Copper conductors shall be used.
 2. All signal cables provided under this contract shall be Class II, plenum-rated cable where required. Where subject to mechanical damage, wiring shall be enclosed in metal conduits or surface metallic raceway.
 3. Data wires shall not be enclosed in conduit or raceways containing AC power wires.
 4. Where EMI may interfere with the proper operation of the DACS circuits, twisted/shielded cable shall be used.

PART 3 - EXECUTION

3.1 INSTALLATION REQUIREMENTS

- A. Work shall be installed as shown on the Drawings in accordance with the manufacturer's diagrams and recommendations, except where otherwise indicated.
- B. Electrical Contractor shall retain the services of the duly appointed representative as specified hereinbefore, who shall furnish all equipment, make all connections to same, and place system in operation. Technician and workman employed shall be particularly skilled in this type of work.
- C. At existing sites, the existing system shall be tested as soon as possible after award of contract and prior to preparing submittals. Contractor shall test entire system to ensure proper operation. Any defects or deficiencies found shall be listed and presented to Owner in letter form. It will be assumed that existing equipment is fully functional unless identified otherwise by Contractor.
- D. Control panel shall be mounted with sufficient clearance for observation and testing.

INTRUSION ALARM SYSTEM
SECTION 28 3100
3595001000

- E. All junction boxes must be clearly marked for distinct identification.
- F. Panel enclosures shall comply with the Requirements of UL 864. Enclosures having doors over forty-eight inches (48") in height shall be provided with a three (3) point catch and lock; all other doors shall contain a cabinet type cylinder lock. Inserts shall be blind fastened so that no screws show on panel front.
- G. Detectors shall be installed in accordance with manufacturer's written instructions in areas as indicated on the Drawings.
- H. Circuits shall be terminated on screw terminals. Terminal blocks shall be Allen-Bradley Bulletin 1492 with 600 volt screw terminals for #22 to #10 conductors, mounted to type N22 channel, or approved equal. Submittal shall show internal elevation of terminal cabinets with equipment laid out.
- I. All cables shall be run through fanning strip to terminals of terminal blocks.
- J. All cables entering terminal cabinet shall be identified with T&B Vinyl, Brady Permashield mylar markers, or equal. Upon completion of installation, six (6) copies of one-line "as-built" wiring diagram shall be furnished to Architect.
- K. Each cable run on wiring diagram shall be identified with exact wire marker code (numerical or alphabetical) as appears in terminal cabinets.
- L. Detector locations shown on drawings are approximate only. Exact locations shall be coordinated with lighting and mechanical equipment and shall be placed in accordance with manufacturer's recommendations (with respect to supply air diffusers, etc.).
- M. Station locations shall be identified by school's actual room numbers and system shall be programmed accordingly. Coordinate actual room numbers with District. Coordinate final programming with District. Contractor shall furnish a printed copy of final programming to District.
- N. End-of-line resistors shall be installed at locations readily accessible, not above an elevation of 10 feet above finish floor or grade, or as shown on Drawings.
- O. No splices shall occur in underground pullboxes. System wiring shall be continuous, without splices, from terminal cabinet to terminal cabinet and control panel to devices. All interior pullboxes shall be accessible and locations shall be recorded on "As-Built" drawings.
- P. Door contacts shall be located 6" from strike side of door and both the switch and magnet shall be "glued" in place with clear silicone. Wiring shall enter door frame through jamb. Do not drill headers.
- Q. Each detector installed in this contract shall have a popit. Each door contact installed in this contract shall have a popit, unless door contacts are shown grouped on drawings. In rooms with accessible ceilings, mount popit in junction box above ceiling. Where hard ceilings occur, provide flush box high on wall or on ceiling with blank finish plate. Wiring shall go to popits, then down to detectors.

**INTRUSION ALARM SYSTEM
SECTION 28 3100
3595001000**

- R. Protected areas accessing remote keypads shall be wired and connected on delay zone, separate from all other protected areas.
- S. After all equipment is installed and is operational, Intrusion Alarm System subcontractor shall set angle settings, sensitivity settings, etc., of each detector to ensure optimum performance and minimal false alarms. Mask out areas of each motion type detector to remove sources of false alarms (windows, heaters, air diffusers, etc.) from detection zones.

3.2 CONSTRUCTION MEETINGS

- A. The Contractor shall schedule construction meetings at the jobsite as follows:
 - 1. Pre-rough-in meeting shall occur before installation of any boxes, raceways, etc. Exact locations of all detectors shall be established as recommended by the Intrusion Alarm System subcontractor.
 - 2. Prewire meeting shall occur after raceways are installed and prior to pulling of any wire or cable.
 - 3. Pre-termination meeting shall occur after wire and cable has been installed and prior to termination.
- B. Meetings shall be scheduled by the Contractor on a building by building basis and shall include the Project Inspector, School's Representative, the electrical subcontractor, and the Intrusion Alarm System subcontractor as a minimum.
- C. One-half to three-quarters of the way through project, District Facilities will set up a meeting (preferably at the school site) with decision makers from Facilities, Police Services, Maintenance, Maintenance Alarm Tech, General Contractor, Alarm Subcontractor, and School Administrator to review the alarm protocol and to identify responsible personnel and timelines.

3.3 TESTS

- A. After all equipment specified herein has been installed and is in operating condition, performance tests shall be conducted to determine that installation and components comply with these specifications.
 - 1. Testing shall be scheduled by the Contractor and shall be conducted at time least disruptive to school activities and as approved by District. Contractor shall provide technicians to conduct all testing (from same firm preparing submittals and performing intrusion alarm work). Testing shall be coordinated to include the Project Inspector and a representative from Engineer's office.
 - 2. At time of testing, Contractor shall ensure that his submittal will reflect all materials and work necessary to make new equipment function properly with existing.
 - 3. Contractor shall furnish all instruments and personnel required for tests.
 - 4. Conduct tests for following:

- a. Verify that the system is free of grounds or open circuits. The central control board shall indicate when a ground or open circuit exists.
 - b. Verify that devices are functioning as specified.
- B. Testing shall be reconducted to verify correction of any defect found in initial testing.
- C. After system is completely tested, the Contractor shall take the following actions with the Owner:
 - 1. The Contractor will schedule a meeting with the Alarm Sub-contractors and Owner's Representatives to determine alarm zone and device nomenclature. The Contractor shall ensure that the alarm zone and device nomenclature matches the actual building and door or room numbers used by the school. Architectural numbering shall not be used. Once confirmed, the Contractor shall demonstrate this to Owner's Representatives.

- END OF SECTION -

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Engineered fill materials.
 - 2. Imported engineered fill material.
 - 3. Landscape backfill material'
 - 4. Decomposed granite.
 - 5. Aggregate base.

1.2 RELATED REQUIREMENTS

- A. Section 01 5000, Temporary Facilities and Controls.
- B. Section 01 8113, Sustainable Design Requirements, for CAL-Green ~~and Collaborative for High Performance Schools (CHPS)~~ general requirements and procedures.
- C. Section 31 2333, Trenching and Backfilling.
- D. Section 32 1200, Asphalt Concrete Paving.
- E. Section 32 1600, Site Concrete.
- F. Section 33 0000, Utilities
- G. Section 33 4000, Storm Drainage Utilities.

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CAL Green), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- C. Local Jurisdiction: Any work within the street, highway or right-of-way shall be performed in accordance with the requirement of the governmental agencies having jurisdiction, and shall not begin until all of those governing authorities have been notified.
- D. ASTM International (ASTM):
 - 1. D698-00 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures, Using 5.5 lb (2.49 Kg) Rammer and 12 inch (304.8 mm) Drop.
 - 2. D1556-00 - Test Method for Density of Soil in Place by the Sand-Cone Method.

**EARTHWORK
SECTION 31 0000
3595001000**

3. D1557-02e2 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 10 lb. (4.54 Kg) Rammer and 18 inch (457 mm) Drop.
4. D3017-05 Test Methods for Moisture Content of Soils and Soil-Aggregate Mixture by Nuclear Methods (Shallow Depth).
5. D422-63(2007) e1 Test Method for Particle Size Analysis of Soil.
6. D4318-05 Test Method for Liquid Limit, Plastic Limit, and Plasticity Limit.

E. CALTRANS Standard Specifications Section 17.

F. CAL-OSHA, Title 8, Section 1590 (e).

1.4 ADMINISTRATION REQUIREMENTS

A. Submittal Procedures:

1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
3. Sustainable Design Submittals shall comply with the additional requirements of Section 01 8113, Sustainable Design Requirements.

B. Site Visitation: All bidders interfacing with existing conditions shall visit the site prior to bid to verify general conditions of improvements. Discrepancies must be reported prior to the bid for clarification.

1.5 ACTION SUBMITTALS

A. Provide supplier's descriptive literature for all products to demonstrate compliance with specified attributes.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Contractor / Installer.

1.7 CLOSEOUT SUBMITTALS

A. Guarantee: Submit subcontractor's guarantee.

1.8 QUALITY ASSURANCE

A. Contractor / Installer shall have been in business for five (5) years providing/finishing similar size projects and complexity.

B. Contractor shall be solely responsible for all subgrades built. Failures resulting from inadequate compaction or moisture content are the responsibility of the contractor. Contractor shall be solely responsible for any and all repairs.

C. The representatives of the Owner's testing lab will not act as supervisor of construction, nor will they direct construction operations. Neither the presence of the Owner's testing

lab representatives nor the testing by the Owner's testing lab shall excuse the contractors or subcontractors for defects discovered in their work during or following completion of the project. Correcting of inadequate compaction or moisture content is the sole responsibility of the contractor.

- D. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.
- E. All materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.
- F. Tests (See Part 3, Article "Testing and Observation" for Compaction Testing).

1.9 DELIVERY, STORAGE AND HANDLING

- A. Transport, store and handle in strict accord with the local jurisdiction.

1.10 FIELD CONDITIONS

1.11 EXISTING SITE CONDITIONS

- A. Contractor shall acquaint himself with all site conditions. If unknown active utilities are encountered during work, notify Architect promptly for instructions. Failure to notify will make Contractor liable for damage to these utilities arising from Contractor's operations subsequent to discovery of such unknown active utilities.
- B. Existing civil, mechanical and electrical improvements are shown on respective site plans to the extent known. Should the Contractor encounter any deviation between actual conditions and those shown, he is to immediately notify the Architect before continuing work.

1.12 ON SITE UTILITY VERIFICATION AND REPAIR PROCEDURES

- A. Ground-breaking requirements:
 - 1. All underground work performed by a Contractor must be authorized by the District's Construction Manager or the Low Voltage Consultant prior to start of construction.
 - 2. The Contractor is to obtain and keep the original School's construction utility site plans on site during all excavation operations. Contractor can contact the District's Construction Manager, Facilities Manager, or the Low Voltage Consultant to procure the drawings.
- B. Underground Utility Locating:
 - 1. The contractor shall hire an Underground Utility Locating Service to locate existing underground utility pathways in areas effected by the scope of work for excavation.
 - 2. Contractor must use an underground utility locator service with a minimum of 3 years experience. The equipment operator must have demonstrated experience.

EARTHWORK
SECTION 31 0000
3595001000

Contact Norcal Underground Locating (800/986-6722) or Precision Locating (800/577-7324)

3. The Underground Utility Locator Service must have the use of equipment with the ability to locate by means of inductive clamping, induction, inductive metal detection, conductive coupling, or TransOnde (Radiodetection) to generate signals, passive locating (free scoping) for "hot" electric, and metal detector.
4. The Underground Utility Locator Service must be able to locate existing utilities at a depth of at least 72".
5. The Underground Utility Locator Service must be able to locate but are not limited to locating the following types of utility pathways:
 - a. All conduit pathways containing 110 volt or greater 50-60Hz electrical wire.
 - b. All conduit pathways containing an active cable TV system.
 - c. All conduit pathways containing wire or conductor in which a signal can be attached and generated without damaging or triggering the existing systems.
 - d. All empty conduit pathways or pipe in which a signal probe or sonde (miniature transmitter) can be inserted.
 - e. All conduit pathways containing non-conductive cables or wires in which a signal probe or sonde (miniature transmitter) can be inserted.
 - f. All plastic and other nonconductive water lines in which a TransOnde Radiodetection) or other "transmitter" can be applied to create a low frequency pressure wave (signal) without damaging or triggering the existing systems.
 - g. All copper or steel waterlines and plastic or steel gas lines.
6. All markings made by the Underground Utility Locator Service or other shall be clear and visible.
7. The contractor shall maintain all markings made by Underground Utility Locator Service or other throughout the entire length of the project.
8. The Underground Utility Locator Service shall provide the contractor with two sets of maps showing the location of utilities and average depth. They will be referenced to permanent buildings. Contractor will deliver one copy to the district at no additional charge.
9. Contractor is responsible to contact Underground Service Alert (U.S.A. 800/227-2600) and receive clearance prior to any excavation operations.
10. Contractor shall inform the (District's Construction Manager)(Architect)(Owner) no later than five (5) days prior to the date scheduled for the utility locator service to be on site.

1.13 PROTECTION

- A. Adequate protection measures shall be provided to protect workmen and passers-by on and off the site. Adjacent property shall be fully protected throughout the operations. Blasting will not be permitted. Prevent damage to adjoining improvements and properties both above and below grade. Restore such improvements to original condition should damage occur. Replace trees and shrubs outside building area disturbed by operations.

- B. In accordance with generally accepted construction practices, the Contractor shall be solely and completely responsible for working conditions at the job site, including safety of all persons and property during performance of the work. This requirement shall apply continuously and shall not be limited to normal working hours.
- C. Any construction review of the Contractor's performance conducted by the Geotechnical Engineer is not intended to include review of the adequacy of the Contractor's safety measures, in, on, or near the construction site.
- D. Provide shoring, sheeting, sheet piles and or bracing to prevent caving, erosion or gullyng of sides of excavation.
- E. Surface Drainage: Provide for surface drainage during period of construction in manner to avoid creating nuisance to adjacent areas. The contractor shall make a reasonable effort on a daily basis to keep all excavations and the site free from water during entire progress of work, regardless of cause, source, or nature of water.
- F. Adjacent streets and sidewalks shall be kept free of mud, dirt or similar nuisances resulting from earthwork operations.
- G. The site and adjacent influenced areas shall be watered as required to suppress dust nuisance. Dust control measures shall be in accordance with the local jurisdiction.
- H. Trees: Carefully protect existing trees that are to remain. Provide temporary irrigation as necessary to maintain health of trees.

1.14 SEASONAL LIMITS

- A. No fill material shall be placed, spread or rolled during unfavorable weather conditions. When work is interrupted by rains, fill operations shall not be resumed until field tests indicate that moisture content and density of fill are satisfactory.
- B. Excessively wet fill material shall be bladed and aerated per Article "Subgrade Preparation".

1.15 TESTING

- A. General: Refer to Section 01 4523 - TESTING AND INSPECTION SERVICES, AND STRUCTURAL TESTS AND INSPECTIONS LIST, DSA-103.
- B. Geotechnical Engineer: Owner is retaining a Geotechnical Engineer to determine compliance of fill with Specifications, and to direct adjustments in fill operations. Costs of Geotechnical Engineer will be borne by Owner; except those costs incurred for re-tests or re-inspection will be paid by Owner and backcharged to Contractor.
 - 1. If Contractor elects to process or mine onsite materials for use as Suitable Fill, Aggregate Sub Base, Aggregate Base, Rock, Crushed Rock or sand the cost of all testing of this material shall be paid for by the Contractor.
 - 2. Testing of import fill for compliance with Department of Toxic Substance Control (DTSC) shall be paid for by the Contractor.

**EARTHWORK
SECTION 31 0000
3595001000**

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Engineered Fill Materials: All fill shall be of approved local materials supplemented by imported fill if necessary. "Approved" local materials are defined as local soils tested and approved by Geotechnical Engineer free from debris, and concentrations of clay and organics; and contain rocks no larger than 3-inches in greatest dimension. The soil and rock should be thoroughly blended so that all rock is surrounded by soil. This may require mixing of the soil and rock with a dozer prior to placement and compaction. Clods, rocks, hard lumps or cobbles exceeding 3-inches in final size shall not be allowed in the upper 6 inches of any fill. Native clay or clayey soils will not be permitted within the upper 12 inches of building pad areas or paved areas.
- B. Imported Engineered Fill Material: Imported fill may be required to complete work. Proposed import fill material shall meet the above requirements; shall be similar to the native soils. Import fill shall meet the above requirements; shall have plasticity index of 20 or less; an Expansion Index of 15 or less; be free of particles greater than 3-inch (3") in largest dimension; be free of contaminants and have corrosion characteristics within the acceptable limits. All import fill material shall be tested and approved by Soils Engineer prior to transportation to the site. Proposed fill material shall comply with DTSC guidelines to include Phase 1 environmental site assessment and related tests. Refer to the October 2001 DTSC Information Advisory for clean imported fill material.
1. DTSC TESTING: Site work contractor is to coordinate testing with an analytical lab, hired by the owner, licensed by the State of California for the DTSC testing. The costs associated with testing will be paid by the contractor.
 2. DTSC testing shall include documentation as to the previous land use, location, and history. Soils shall be analyzed for all compounds of concern to ensure the imported soil is uncontaminated and acceptable. Testing shall be performed per the recommendations included in DTSC Imported Fill Advisory http://www.dtsc.ca.gov/Schools/upload/SMP_FS_Cleanfill-Schools.pdf). Soils shall be tested prior to import to the project site.
 3. Lab shall determine geographically which tests and analysis comparison will be appropriate for the testing. (CAM 17 / Title 22); (RWQCB) Regional Water Quality Control Board; or (OEHHA) Office of Environmental Health Hazard Assessment.
 4. Frequency of testing shall be conducted in accordance with DTSC's Imported Fill Advisory as follows;

Fill Material Sample Schedule	
Area Of Individual Borrow Area	Sampling Requirements
2 Acres or less	Minimum of 4 samples
2 to 4 Acres	Minimum of 1 sample every ½ acre
4 to 10 Acres	Minimum of 8 samples

**EARTHWORK
SECTION 31 0000
3595001000**

Greater than 10 Acres	Minimum of 8 locations with 4 subsamples per location
-----------------------	---

Volume of Borrow Area Stockpile	
Up to 1,000 Cubic Yards	1 sample per 250 cubic yards
1,000 to 5,000 Cubic Yards	4 samples for the first 1000 cubic yards + 1 sample per each additional 500 cubic yards
Greater than 5,000 Cubic Yards	12 samples for the first 5,000 cubic yards + 1 sample per each additional 1,000 cubic yards

5. Reports/ Documentation
 - a. Results of the testing analysis shall be sent to the Owner; Architect; Project Inspector, Project Civil Engineer, DTSC, and DSA. Letter shall reference DSA file and application numbers.
- C. Landscape Backfill Material:
 1. The top 3" of native topsoil stripped from the site may be used for landscape backfill material.
- D. Water: Furnish all required water for construction purposes, including compaction and dust control. Water shall be potable.
- E. Aggregate Base: Provide Class 2 3/4" Aggregate Base conforming to standard gradation as specified in Cal Trans Standard Specifications, Section 26,-1.02A.
- F. Decomposed Granite: Decomposed Granite shall be well graded mixture of fine to 1/8" particles in size with no clods. The material shall be free of vegetation, other soils, debris and rock. The material shall be redish-tan to tan in color.
- G. Decomposed Granite Solidifier: PolyPavement or equal.

PART 3 - EXECUTION

3.1 INSPECTION LAYOUT AND PREPARATION

- A. Prior to installation of the work of this Section, carefully inspect and verify by field measurements that installed work of all other trades is complete to the point were this installation may properly commence
- B. Layout all work, establish grades, locate existing underground utilities, set markers and stakes, setup and maintain barricades and protection facilities; all prior to beginning

**EARTHWORK
SECTION 31 0000
3595001000**

actual earthwork operations. Layout and staking shall be done by a licensed Land Surveyor or Professional Civil Engineer.

- C. Verify that specified items may be installed in accordance with the approved design.
- D. In event of discrepancy, immediately notify Owner and the Architect. Do not proceed in discrepant areas until discrepancies have been fully resolved.

3.2 PERFORMANCE

A. GENERAL:

- 1. General: Do all grading, excavating and cutting necessary to conform finish grade and contours as shown. All cuts shall be made to true surface of subgrade.
- 2. Archaeological Artifacts: Should any artifacts of possible historic interest be encountered during earthwork operations, halt all work in area of discovery and immediately contact the Architect for notification of appropriate authorities.
- 3. Degree of Compaction: Percentage of maximum density, hereinafter specified as degree of compaction required, means density equivalent to that percentage of maximum dry density determined by ASTM D1557 Compaction Test method, and such expressed percentage thereof will be minimum acceptable compaction for specified work.
- 4. Moisture Content: Moisture content shall be as noted below and as called for on the plans. Moisture content shall be maintained until subgrade is covered by surfacing materials.

3.3 DEMOLITION, DISPOSAL AND DISPOSITION OF UNDESIRABLE MAN-MADE FEATURES

- A. All other obstructions, such as abandoned utility lines, septic tanks, concrete foundations, and the like shall be removed from site. Excavations resulting from these removal activities shall be cleaned of all loose materials, dish shaped, and widened as necessary to permit access for compaction equipment. Areas exposed by any required over-excavation should be scarified to a depth of 12", moisture-conditioned to near optimum moisture content, and recompacted to at least 95% of the maximum dry density.

3.4 TESTING AND OBSERVATION

- A. All grading and earthwork operations shall be observed by the Geotechnical Engineer or his representative, serving as the representative of the Owner.
- B. Field compaction tests shall be made by the Geotechnical Engineer or his representative. If moisture content and/or compaction are not satisfactory, Contractor will be required to change equipment or procedure or both, as required to obtain specified moisture or compaction. Notify Geotechnical Engineer at least 48 hours in advance of any filling operation.
- C. Earthwork shall not be performed without the notification or approval of the Geotechnical Engineer or his representative. The Contractor shall notify the Geotechnical Engineer at least two (2) working days prior to commencement of any aspect of the site earthwork.

- D. If the Contractor should fail to meet the compaction or design requirements embodied in this document and on the applicable plans, he shall make the necessary readjustments until all work is deemed satisfactory, as determined by the Geotechnical Engineer or Architect/Engineer.
- E. After each rain event Geotechnical Engineer shall test fill material for optimum moisture. Do not place any fill material until desired moisture is achieved.

3.5 CLEARING AND GRUBBING

- A. Prior to grading, remove all debris off-site. Remove trees and brush including the root systems. Holes resulting from tree and brush removal should be prepared and backfilled in accordance with paragraphs 3.7, 3.8, 3.9, and 3.10. This may require deepening and/or widening the holes to adequately remove disturbed soil and provide room for compaction equipment. Strip the surface of all organics. Strippings meeting the requirements of Section 32 9000 may be used in landscape areas only.

3.6 CUTTING

- A. Building pads that are located within a cut/fill transition area will have to be overexcavated to provide a semi-uniform fill beneath the building pad. The portions of building pads located in cut areas shall be overexcavated to provide no more than 1 foot difference in fill placed in the same building pad.
- B. Do all cutting necessary to bring finish grade to elevations shown on Drawings.
- C. When excavation through roots is necessary, cut roots by hand.
- D. Carefully excavate around existing utilities to avoid unnecessary damage. The contractor shall anticipate and perform hand work near existing utilities as shown on the survey, without additional claims or cost.

3.7 STRUCTURAL EXCAVATION

- A. General: Excavate to bear on firm material at contract depth shown on Structural Drawings.
- B. Footings: All footing excavations shall be of sufficient width for installation of formwork, unless earth will retain its position during concreting. All portions of footings above grade must be formed. In the event that footings are placed against earth, footing widths below grade shall be increased 2 inches from those shown on Drawings and positive protection shall be provided for top corners of trench.
- C. Unsuitable Ground: Any errors in structural excavation, soft ground, or clay soils found when excavating shall be reported to Architect. In no case shall work be built on any such soft or clayey unsuitable surface without direction from the Architect. Restore excavations to proper elevation with engineered fill material compacted to 95% of dry density.

EARTHWORK
SECTION 31 0000
3595001000

3.8 SUBGRADE PREPARATION

- A. Grade compact and finish all subgrades within a tolerance of 0.10' of grades as indicated on Drawings and so as not to pool water. Subgrade within building pads and concrete walks shall be within 0.05' of grades indicated.
- B. After clearing, grubbing and cutting, subsurface shall be plowed or scarified to a depth of at least 12", until surface is free from ruts, hummocks or other uneven features. Moisture condition to 2% above optimum moisture content and recompact to at least 95% of the maximum dry density as determined by ASTM Test Method D1557. If the existing soils are at a water content higher than specified, the contractor shall provide multiple daily aerations by ripping, blading, and/or discing to dry the soils to a moisture content where the specified degree of compaction can be achieved. After seven consecutive working days of daily aerations, and the moisture content of the soil remains higher than specified, the contractor shall notify the architect. If the existing soils have a moisture content lower than specified, the contractor shall scarify, rip, water and blade existing soil to achieve specified moisture content. The contractor shall make proper allowance in schedule and methods to complete this work.
- C. After subgrade for fill within building pad area or within paved areas has been cleared, plowed and scarified, it shall be disked or bladed until uniform and free from large clods, brought to 2% above optimum moisture content and compacted to not less than 95% of maximum dry density, as determined by ASTM Test Method D1557, and such expressed percentage thereof will be minimum acceptable density for specified work.
- D. Subgrade in areas to receive landscaping shall be compacted to (85%).
- E. Where Contractor over-excavates building pads through error, resulting excavation shall be recompacted as engineered fill at Contractor's expense.

3.9 PLACING, SPREADING AND COMPACTING FILL MATERIAL IN BUILDING PAD AND PAVEMENT AREAS

- A. Selected fill material shall be placed in layers which, when compacted, shall not exceed 6 inches in compacted thickness. Each layer shall be spread evenly and thoroughly mixed to insure uniformity in moisture content.
- B. Selected fill material shall be moisture-conditioned to specified moisture content. Selected fill material shall be unfrozen. When moisture content of fill material is below that specified, add water until proper moisture content is achieved. When moisture content is above that specified, aerate by blading or other methods mentioned in 3.08 B until moisture content is satisfactory.
- C. After each layer has been placed, mixed and spread evenly, it shall be thoroughly compacted to a minimum of 90% as determined by the ASTM D1557 Compaction Test. Compact each layer over its entire area until desired density has been obtained.
- D. Recomposition of Fill in Trenches and Compaction of Fill Adjacent to Walls: Where trenches must be excavated, backfill with material excavated. Place in lifts that when compacted do not exceed 6", moisture conditioned to (optimum)(2% above optimum)

moisture content, and compact to a minimum of 90% relative compaction in building pad and paved areas, and to 90% relative compaction in landscape areas.

- E. Jetting of fill materials will not be allowed.

3.10 FINAL SUBGRADE COMPACTION

- A. Building Pads: Upper 12" of all final building pad subgrades (including future buildings) shall be uniformly compacted at specified moisture content to at least 90% of maximum dry density, as determined by ASTM D1557 Compaction Test, regardless of whether final subgrade elevation is attained by filling, excavation, or is left at existing grade. After acceptance of final compaction test, contractor shall maintain the required moisture content of subgrade until concrete flatwork is placed.
- B. Paved Areas: Upper 12" of all final subgrades supporting pavement sections and all other flatwork shall be brought to specified moisture content and shall be uniformly compacted to not less than 95% of maximum dry density, regardless of whether final subgrade elevation is attained by filling, excavation, or is left at existing grade. After acceptance of final compaction test, contractor shall maintain the required moisture content of subgrade until concrete flatwork is placed.
- C. Other Fill and Backfill: Upper 12" of all other final subgrades or finish grades shall be compacted to 90% of maximum dry density.
- D. Gravel Fill: Do not place compacted gravel fill until after underground work and foundations are in place. Compact gravel fill with vibratory plate or similar equipment to preclude settlement.

3.11 PLACING, SPREADING, AND COMPACTION OF LANDSCAPE BACKFILL MATERIALS

- A. All landscaped areas shall receive topsoil. After subgrade under landscape area has been scarified and brought to 85% maximum dry density, top soil shall be placed evenly to depth of 12" at 85% of maximum dry density.
- B. Project Inspector must verify that materials are uniformly spread to minimum depth specified.

3.12 SLOPE CONSTRUCTION

- A. Cut slopes shall be constructed to no steeper than 2:1(horizontal:vertical). Fill slopes shall be constructed to no steeper than 2:1 (horizontal:vertical). Prior to placement of fill on an existing slope the existing slope shall be benched. The benches shall be in a ratio of 2 horizontal to 1 vertical. The face of the fill slopes shall be compacted as the fill is placed, or the slope may be overbuilt and then cut back to the design grade. Compaction by track walking will not be allowed.

3.13 FINISH GRADING

- A. At completion of project, site shall be finished graded, as indicated on Drawings. Finish grades shall be "flat graded" to grades shown on the drawing. Mounding of finish grades

**EARTHWORK
SECTION 31 0000
3595001000**

will not be allowed unless otherwise directed on the landscape drawings. Tolerances for finish grades in drainage swales shall be $\pm 0.05'$. Tie in new and existing finish grades. Leave all landscaped areas in finish condition for lawn seeding. Landscaped planters shall be graded uniformly from edge of planter to inlets. If sod is used for turf areas the finish grade on which it is placed shall be lowered to allow for sod thickness.

- B. All landscape areas shall be left free of rock or foreign material.
- C. All landscape areas shall be approved by Architect prior to any planting.

3.14 SURPLUS MATERIAL

- A. Excavated material not required for grading or backfill shall be removed from site at contractor's expense.

3.15 CLEANING

- A. Refer to Section 01 7700.
- B. Remove from fill all vegetation, wood, form lumber, casual lumber, and shavings, in contact with ground; buried wood will not be permitted in any fill.

END OF SECTION

*s:\master specifications\division 31 - earthwork\31 0000_earthwork.docx
Received from WCEI: June 7, 2018, Updated format: 9-3-21*

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Trench backfill materials.

1.2 RELATED REQUIREMENTS

- A. Section 01 5000, Temporary Facilities and Controls.
- B. Section 01 8113, Sustainable Design Requirements, for CAL-Green **[and Collaborative for High Performance Schools (CHPS)]** general requirements and procedures.
- C. Section 31 0000, Earthwork.
- D. Section 32 8000, Irrigation.
- E. Section 33 0000, Utilities
- F. Section 33 4000, Storm Drainage Utilities.

1.3 REREENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CAL Green), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- C. California Plumbing Code (CPC), edition as noted on the drawings.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Submittal Procedures:
 - 1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
 - 2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
 - 3. Sustainable Design Submittals shall comply with the additional requirements of Section 01 8113, Sustainable Design Requirements.
- B. Coordination:
 - 1. General Contractor shall coordinate work as herein specified, in accordance with drawings and as required to complete scope of work with all related trades.

TRENCHING AND BACKFILLING
SECTION 31 2333
3595001000

1.5 ACTION SUBMITTALS

- A. Provide supplier's descriptive literature for all products to demonstrate compliance with specified attributes:

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For contractor / Installer.

1.7 CLOSEOUT SUBMITTALS

- A. Guarantee: Submit subcontractor's guarantee.

1.8 QUALITY ASSURANCE

- A. Contractor / Installer shall have been in business for five (5) years providing/finishing similar size projects and complexity.
- B. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.
- C. All materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.

1.9 DELIVERY, STORAGE AND HANDLING

- A. Transport, store and handle in strict accord with the local jurisdiction.

1.10 FIELD CONDITIONS

- A. Contractor shall acquaint himself with all existing site conditions. If unknown active utilities are encountered during work, notify Architect promptly for instructions. Failure to notify will make Contractor liable for damage to these utilities arising from Contractor's operations subsequent to discovery of such unknown active utilities.
- B. Trench dewatering may be necessary. Contractor shall provide any and all tools, equipment and labor necessary for trench dewatering no matter what the source. Dewatering shall be continuous until all site utilities are installed and backfilled.

1.11 PROTECTION

- A. Adequate protection measures shall be provided to protect workers and passers-by on and off the site. Adjacent property shall be fully protected throughout the operations. Blasting will not be permitted. Prevent damage to adjoining improvements and properties both above and below grade. Restore such improvements to original condition should damage occur. Replace trees and shrubs outside building area disturbed by operations. Repair all trenches in grass areas with new sod (seeding not permitted) and "stake-off" for protection.

TRENCHING AND BACKFILLING
SECTION 31 2333
3595001000

- B. Contractor shall be solely and completely responsible for working conditions at the job site, including safety of all persons and property during performance of the work. This requirement shall apply continuously and shall not be limited to normal working hours.
- C. Any construction review of the Contractor's performance conducted by the Architect or Owner is not intended to include review of the adequacy of the Contractor's safety measures, in, on or near the construction site.
- D. Provide shoring, sheeting, sheet piles and or bracing to prevent caving, erosion or gulying of sides of excavation.
- E. Surface Drainage: Provide for surface drainage during period of construction in manner to avoid creating nuisance to adjacent areas. Keep all excavations free from water during entire progress of work, regardless of cause, source or nature of water.
- F. Adjacent streets and sidewalks shall be kept free of mud, dirt or similar nuisances resulting from earthwork operations.
- G. The site and adjacent influenced areas shall be watered as required to suppress dust nuisance.
- H. Trees: Carefully protect existing trees which are to remain.

1.12 TRENCH SAFETY PROVISIONS

- A. General Contractor shall be solely responsible for safety design, construction and coordination with agencies having jurisdiction. If such plan varies from shoring system standards established by Construction Safety Orders, plan shall be prepared by registered civil or structural engineer.
- B. Nothing herein shall be deemed to allow use of shoring, sloping or protective system less effective than that required by Construction Safety Orders of California State Division of Industrial Safety.
- C. When trenching through paved surface, provide steel trench plates to cover open trenches daily until trenches are backfilled.

1.13 SEASONAL LIMITS

- A. No backfill material shall be placed, spread or rolled during unfavorable weather conditions. When work is interrupted by heavy rains, full operations shall not be resumed until field tests indicate that moisture content and density of fill are satisfactory.
- B. Material above optimum moisture shall be processed per Section 31 0000, Part 3, Article "Subgrade Preparation".

1.14 TESTING

- A. General: Refer to Section 31 0000, Part 1, Article "Testing" and Part 3, Article "Testing and Observation".

TRENCHING AND BACKFILLING
SECTION 31 2333
3595001000

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Backfill materials: Pipeline and conduit trench backfill as shown on the plans and as specified below.
 - 1. ¾ inch crush rock.
 - 2. Native Materials: Soil native to Project Site, free of wood, organics, and other deleterious substances. Rocks shall not be greater than 3-inches.
 - 3. Sand: Fine granular material, free of organic matter, mica, loam or clay.
 - 4. Lean Mix Concrete: 3 sacks of cement per yard plus sand.
 - 5. Class 2 aggregate base, ¾" rock, per Caltrans Section 26-1.02B
 - 6. Controlled Density Fill: 3 sack slurry backfill.
- B. Water: Furnish all required water for construction purposes, including compaction and dust control. Water shall be potable.
- C. Provide other bedding and backfill materials as described and specified in Section 33 0000, Section 33 4000 and Divisions 22 and 26.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verification of Conditions:
 - 1. Examine areas and conditions under which work is to be performed.
 - 2. Identify conditions detrimental to proper or timely completion of work and coordinate with General Contractor to rectify.

3.2 INSTALLATION

- A. Perform work in accordance with pipe manufacturer's recommendations, as herein specified and in accordance with drawings.

3.3 TRENCHING

- A. Make all trenches open vertical construction with sufficient width to provide free working space at both sides of trench around installed item as required for caulking, joining, backfilling and compacting; not less than 12 inches wider than pipe or conduit diameter, unless otherwise noted.
- B. Carefully excavate around existing utilities to avoid unnecessary damage. The contractor shall anticipate and perform hand work near existing utilities as shown on the survey, without additional claims or cost.
- C. Trench straight and true to line and grade with bottom smooth and free of edges or rock points.

TRENCHING AND BACKFILLING
SECTION 31 2333
3595001000

- D. Where depths are not shown on the plans, trench to sufficient depth to give minimum fill above top of installed item measured from finish grade above the utility as follows:
1. Sewer pipe: depth to vary
 2. Storm drain pipe: depth to vary
 3. Water pipe - Fire Supply: 36 inches
 4. Water pipe – Domestic Supply: 30 inches

3.4 BACKFILL

- A. Pipe Trench Backfill is divided into three zones:
1. Bedding: Layer of material directly under the pipe upon which the pipe is laid.
 2. Pipe Zone: Backfill from the top of the bedding to 6 inches (compacted) over the top of the pipe.
 3. Upper Zone: Backfill between top of Pipe Zone and to surface of subgrade.
- B. Bedding: Type of material and degree of compaction for bedding backfill shall be as defined in the Details and Specifications.
- C. Pipe Zone and Upper Zone Backfill:
1. Type of material and degree of compaction Pipe Zone and Upper Zone Backfill shall be as required by Drawings, Details, & Specifications.
 2. Upper Zone Backfill shall not be placed until conformance of Bedding and Pipe Zone Backfill with specified compaction test requirements has been confirmed.
 3. Backfill shall be brought up at substantially the same rate on both sides of the pipe and care shall be taken so that the pipe is not floated or displaced. Material shall not be dropped directly on pipe.
- D. Backfill Compaction:
1. Backfill shall be placed in layers which, when compacted shall not exceed 6 inches in thickness. Each layer shall be spread evenly and thoroughly mixed to insure uniformity. Do not backfill over, wet, frozen or soft subgrade surfaces. Employ a placement method that does not disturb or damage foundation walls, perimeter drainage, foundation damp-proofing, waterproofing or protective cover.
 2. When moisture content of fill material is below that required to achieve specified density, add water until proper moisture content is achieved. When moisture content is above that required, aerate by blading or other methods until specified moisture content is met; see Section 31 0000, Part 3, Article "Subgrade Preparation".
 3. After each layer has been placed, mixed and spread evenly, it shall be thoroughly compacted to 95% of maximum dry density while at specified moisture content. Compact each layer over its entire area until desired density has been obtained.
 4. Compaction: All backfill operations shall be observed by the Inspector of Record and/or Geotechnical Engineer. Field density tests shall be made to check compaction of fill material. If densities are not satisfactory, Contractor will be

TRENCHING AND BACKFILLING
SECTION 31 2333
3595001000

required to change equipment or procedure or both, as required to obtain specified densities. Notify Inspector and Architect at least 24 hours in advance of any operation.

E. Backfill in Areas Previously Lime or Cement Treated

1. Where trenching occurs in areas that have been lime or cement treated, class 2 aggregate bases or approved controlled density backfill material shall be used for the top 12-inches minimum of the trench or thickness shall match the depth of treated material.

3.5 TRENCH AND SITE RESTORATION

- A. Finished surface of trenches shall be restored to a condition equal to, or better than the condition as existed prior to excavation work.

3.6 PROTECTION

- A. Protect existing surfaces, structures, and utilities from damage. Protect work by others from damage. In the event of damage, immediately repair or replace to satisfaction of Owner.
- B. Repair existing landscaped areas to as new condition. Replant trees, shrubs or groundcover with existing materials if not damaged or with new materials if required. Replace damaged lawn areas with sod, no seeding will be permitted.
- C. Replace damaged pavement with new compatible matching materials. Concrete walks to be removed to nearest expansion joint and entire panel replaced. Asphalt to be cut neatly and replaced with new materials.
- D. Any existing materials removed or damaged due to trenching to be returned to new condition.

3.7 SURPLUS MATERIAL

- A. Remove excess excavated material, unused materials, damaged or unsuitable materials from site.

3.8 CLEANING

- A. Refer to Section 01 7700.
- B. Contractor will keep the work areas in a clean and safe condition so his rubbish, waste, and debris do not interfere with the work of others throughout the project and at the completion of work.
- C. After completion of work in this section, remove all equipment, materials, and debris. Leave entire area in a neat, clean, acceptable condition.

TRENCHING AND BACKFILLING
SECTION 31 2333
3595001000

END OF SECTION

s:\master specifications\division 31 - earthwork\31 2333_trenching and backfilling.docx
Received from WCEI: October 20, 2012; Updated 9-2-21

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Aggregate.
 - 2. Asphalt paving.
 - 3. Seal coat.
 - 4. Wood headers and stakes.
 - 5. Pavement marking.
 - 6. Precast concrete bumpers.

1.2 RELATED REQUIREMENTS

- A. Section 01 5000, Temporary Facilities and Controls.
- B. Section 01 6116, Volatile Organic Compound (VOC) Restrictions, for VOC limits pertaining to adhesives, sealants, fillers, primers, and coatings.
- C. Section 01 8113, Sustainable Design Requirements, for CAL-Green **[and Collaborative for High Performance Schools (CHPS)]** general requirements and procedures.
- D. Section 31 0000, Earthwork.
- E. Section 31 2333, Trenching and Backfilling.
- F. Section 32 8000, Irrigation.
- G. Section 33 0000, Utilities.
- H. Section 33 4000, Storm Drainage Utilities.

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CAL Green), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- C. Local Jurisdiction: Any work within the street, highway or right-of-way shall be performed in accordance with the requirement of the governmental agencies having jurisdiction, and shall not begin until all of those governing authorities have been notified.
- D. ASTM International (ASTM):

**ASPHALT CONCRETE PAVING
SECTION 32 1200
3595001000**

1. D698-00 Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures, Using 5.5 lb (2.49 Kg) Rammer and 12 inch (304.8 mm) Drop.
2. D1556-00 Test Method for Density of Soil in Place by the Sand-Cone Method.
3. D1557-02 Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 10 lb. (4.54 Kg) Rammer and 18 inch (457 mm) Drop.
4. D6628-16 Standard Specification for Color of Pavement Marking Materials.
5. D3017-05 Test Methods for Moisture Content of Soils and Soil-Aggregate Mixture by Nuclear Methods (Shallow Depth).
6. D4318-05 Test Method for Liquid Limit, Plastic Limit, and Plasticity Limit.

E. CALTRANS Standard Specifications.

F. CAL-OSHA, Title 8, Section 1590 (e).

1.4 ADMINISTRATION REQUIREMENTS

A. Submittal Procedures:

1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
3. Sustainable Design Submittals shall comply with the additional requirements of Section 01 8113, Sustainable Design Requirements.

1.5 ACTION SUBMITTAS

A. Provide supplier's descriptive literature for all products to demonstrate compliance with specified attributes.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Contractor / Installer.

B. Sustainable Design:

1. General
 - a. Submit information necessary to establish and document compliance with the California Green Building Standards Code.
 - b. Sustainable design submittals are in addition to other submittals.
2. The following information shall be provided:
 - a. Adhesives and Sealants: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.
 - b. Paints and Coatings: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.

1.7 CLOSEOUT SUBMITTALS

- A. Guarantee: Submit subcontractor's guarantee.

1.8 QUALITY ASSURANCE

- A. Contractor / Installer shall have been in business for five (5) years providing/finishing similar size projects and complexity.
- B. Contractor shall be solely responsible for all subgrades built. Any repairs resulting from inadequate compaction is the responsibility of the contractor.
- C. The representatives of the Owner's testing lab will not act as supervisor of construction, nor will they direct construction operations. Neither the presence of the Owner's testing lab representatives nor the testing by the Owner's testing lab shall excuse the contractors or subcontractors for defects discovered in their work during or following completion of the project. Correcting inadequate compaction is the sole responsibility of the contractor.
- D. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.
- E. All materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.
- F. Contractor shall provide verification that asphalt mix temperature meets the requirements of this specification at time of application.
- G. Tests (See Part 1, Article "Testing").

1.9 DELIVERY, STORAGE AND HANDLING

- A. Transport, store and handle in strict accord with the local jurisdiction.

1.10 FIELD CONDITIONS

- A. Environmental Requirements:
 - 1. Base Course: Do not lay base course on muddy subgrade, during wet weather, or when atmospheric temperature is below 40 degrees F.
 - 2. Asphalt Surfacing: Do not apply asphaltic surfacing on wet base, during wet weather, or when atmospheric temperature is below 50 degrees F.

1.11 EXISTING SITE CONDITIONS

- A. Contractor shall acquaint himself with all site conditions. If unknown active utilities are encountered during work, notify Architect promptly for instructions. Failure to notify will make Contractor liable for damage to these utilities arising from Contractor's operations subsequent to discovery of such unknown active utilities.

**ASPHALT CONCRETE PAVING
SECTION 32 1200
3595001000**

1.12 PROTECTION

- A. Adequate protection measures shall be provided to protect workmen and passers-by on and off the site. Adjacent property shall be fully protected throughout the operations. Blasting will not be permitted. Prevent damage to adjoining improvements and properties both above and below grade. Restore such improvements to original condition should damage occur. Replace trees and shrubs outside building area disturbed by operations.
- B. In accordance with generally accepted construction practices, the Contractor shall be solely and completely responsible for working conditions at the job site, including safety of all persons and property during performance of the work. This requirement shall apply continuously and shall not be limited to normal working hours.
- C. Any construction review of the Contractor's performance conducted by the owner's representative is not intended to include review of the adequacy of the Contractor's safety measures, in, on, or near the construction site.
- D. Surface Drainage: Provide for surface drainage during period of construction in manner to avoid creating nuisance to adjacent areas. The contractor shall make a reasonable effort on a daily basis to keep all excavations and the site free from water during entire progress of work, regardless of cause, source, or nature of water.
- E. Adjacent streets and sidewalks shall be kept free of mud, dirt or similar nuisances resulting from earthwork operations.
- F. The site and adjacent influenced areas shall be watered as required to suppress dust nuisance. Dust control measures shall be in accordance with the local jurisdiction.

1.13 SEASONAL LIMITS

- A. No fill material shall be placed, spread or rolled during unfavorable weather conditions. When work is interrupted by rains, fill operations shall not be resumed until field tests indicate that moisture content and density of fill are satisfactory.

1.14 TESTING

- A. General: Refer to Section 01 4523 – TESTING & INSPECTION SERVICES AND STRUCTURAL TESTS AND INSPECTIONS LIST, DSA-103.
- B. Geotechnical Engineer: Owner is retaining a Geotechnical Engineer to determine compliance of fill with Specifications, and to direct adjustments in fill operations. Costs of Geotechnical Engineer will be borne by Owner; except those costs incurred for re-tests or re-inspection will be paid by Owner and backcharged to Contractor.

PART 2 - PRODUCTS

2.1 DESIGN AND PERFORMANCE CRITERIA

- A. Sustainable Design:

**ASPHALT CONCRETE PAVING
SECTION 32 1200
3595001000**

1. VOC emissions for field-applied adhesives, sealants, and sealant primers must comply with limits specified in Section 01 6116.
2. VOC emissions for field-applied paints and coatings must comply with limits specified in Section 01 6116.

2.2 MATERIALS

- A. Sterilant: Soil sterilizer shall be CIBA GEIGY's Pramitol 25-E, Treflan EC or Thompson-Hayward Casoron.
 1. Soil sterilizer shall be applied in strict accordance with manufacturer's instructions.
- B. Base Course Aggregate: State Specifications, Section 26, Class 2 aggregate base (3/4" max.).
- C. Asphalt Binder: Steam-refined paving asphalt conforming to State Specifications, Section 92, viscosity grade PG 64-10. Asphalt binder additives for HMA per Caltrans approved list of manufacturers.
- D. Liquid Asphalt Tack Coat: Per CALTRANS section 94.
- E. Surface Course Aggregate: Mineral aggregates for Type "B" asphalt concrete, conforming to State Specifications 39-2.02, Type B, 1/2" maximum, medium gradient. 3/8" maximum gradient at Playcourt.
- F. Seal Coat: shall be a pre-mixed asphalt emulsion blended with select fillers and fibers such as:
 1. "Park-Top No. 302", Western Colloid Products.
 2. "Overcoat", Reed and Gram.
 3. "Drivewalk", Conoco Oil.
- G. Wood Headers and Stakes: Pressure treated.
- H. Pavement Marking: Colors as directed by Architect. Colors of painted traffic stripes and pavement markings must comply with ASTM D6628.
 1. Waterborne traffic line - colors white, yellow and red, State specification PTWB-01R3.
 2. Waterborne traffic line for the international symbol of accessibility and other curb markings – blue, red and green, Federal specification TT-P-1952F.
- I. Precast Concrete Bumpers: 3000 psi at 28 day minimum strength; 48" length unless otherwise indicated; provide with steel dowel anchors and concrete epoxy.
- J. Pavement Epoxy; K-Lite; KtepX-590; Ennis Epoxy HPS2 or an approved equal.
- K. Crack Filler; QPR model CAR08, 10oz asphalt crack filler; Star STA-FLEX Trowel Grade crack filler or approved equal.

ASPHALT CONCRETE PAVING
SECTION 32 1200
3595001000

- L. Reclaimed Asphalt Paugment (RAP). HMA Type A or Type B may be produced using RAP providing it does not exceed 15% or the aggregate blend.

2.3 MIXES

- A. General: Plant mixed conforming to State Specifications, Section 39, Type B, 1/2" maximum, medium grading. 3/8" maximum grading shall be used at hardcourt.
- B. Temperature of Hot Mix Asphalt: Not less than 275 degrees F nor more than 325 degrees F when added to aggregate.
- C. Temperature of Hot Mix Aggregate: Not less than 250 degrees F nor more than 325 degrees F when asphalt is added.
- D. Temperature of Hot Mix Asphalt Concrete: Asphalt shall be not less than 285 degrees at time of application, nor more than 350 degrees. Asphalt not meeting the required temperature shall not be used.
- E. Temperature of Warm Mix Asphalt: Mixing and placement; per the approved manufactures heat range recommendations for mixing and placement.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Conditions of Work in Place: Subsurfaces which are to receive materials specified under this Section shall be carefully examined before beginning work hereunder, and any defects therein shall be reported, in writing, to the Architect. Work shall not be started until such defects have been corrected. Starting of work shall imply acceptance of conditions as they exist.

3.2 PREPARATION

- A. Sub-Grade: Clean, shape and compact to hard surface free from elevations or depressions exceeding 0.05' in 10' from true plan. Compact per Section 31 0000. Compaction and moisture content shall be verified immediately prior to placement of aggregate base. Proof roll subbase in presence of geotechnical engineer prior to placement of aggregate base.

3.3 INSTALLATION

- A. Headers:
 - 1. General: Install as edging to asphalt paving, except where adjoining existing pavement, concrete curbs, walks or building.
 - 2. Existing Headers: Remove existing headers where new paving will join existing. Saw cut existing asphalt to provide clean edge.
 - 3. Lines and Levels: Install true to line and grade. Cut off tops of stakes 2-inches below top of header so they will not be visible on completion of job.

**ASPHALT CONCRETE PAVING
SECTION 32 1200
3595001000**

B. Asphalt Paving:

1. Base Course: Install in accord with State Specifications, Section 26. Compact to relative compaction of not less than 95%, ASTM D1557. The material shall be deposited on the subgrade in such a manner as to provide a uniform section of material within five percent tolerance of the predetermined required depth. Deposition will be by spreader box or bottom dump truck to prevent segregation of the material. The material so deposited on the subgrade shall have sufficient moisture which, in the opinion of the Architect is adequate to prevent excessive segregation. It shall then be immediately spread to its planned grade and cross section. Undue segregation of material, excessive drifting or spotting of material will not be permitted. If in the opinion of the site geotechnical engineer, the material is unsuitably segregated, it shall be removed or completely reworked to provide the desired uniformity of the material.
 - a. Moisture content and compaction of base material shall be tested immediately prior to placement of asphalt paving.
2. Sterilant: Apply specified material at manufacturer's recommended rate. Applicator of sterilant material shall be responsible for determining location of all planter areas. Apply specified material over entire base course area just prior to application of asphalt. Follow manufacturer's printed directions.
3. Liquid Asphalt Tack Coat: Apply as "tack coat" to all vertical surfaces of existing paving, curbs, walks, and construction joints in surfacing against which paving is to be placed.
4. Asphalt Concrete Surface Course:
 - a. Comply with State Specifications, 39-6 except as modified below.
 - 1) Final gradation shall be smooth, uniform and free of ruts, humps, depressions or irregularities, with a minimum density of 91% of the theoretical maximum specific gravity determined by California Test Method #309. Maximum variation 1/8 inch in 10' when measured with steel straightedge in any one direction. Test paved areas for proper drainage by applying water to cover area. Correct portions that do not drain properly by patching with plant mix. In no case shall accessible parking spaces or loading and unloading areas exceed 2% slope in any direction.
 - 2) Asphalt material shall be delivered to the project site in a covered condition to maintain acceptable temperature.
5. Placement and adjustment of Frames, Covers, Boxes and Grates: The Contractor shall set and adjust to finish grade all proposed and existing frames, covers, boxes, and grates of all manholes, drop inlets, drain boxes, valves, cleanouts, electrical boxes and other appurtenant structures prior to placement of asphaltic concrete.
6. Water Testing: All paved areas shall be water tested, to check drainage, in the presence of the project inspector prior to placement of seal coat. The surface of asphalt paving shall not vary more than 1/8 inch above or below the grade established on the plans. If variations in grade are present, they will be corrected by overlaying paving and/or pavement removal and replacement as directed by the Architect.

**ASPHALT CONCRETE PAVING
SECTION 32 1200
3595001000**

7. Patching: Cut existing paving square and plumb at all edges to be joined by new paving. In trenches; grind existing asphalt on each side of trench 3" wide x 1/2 the depth of the section. Apply tack coat to vertical surfaces before installing new work. Warp carefully to flush surface, with seal over joints, and feather edge. Sawcut, remove and patch existing paving where cutting is necessary for installation of piping or conduits under Divisions 15, 16 and 33.
8. Seal Coat:
 - a. Seal coat shall be applied no sooner than 30 days from time of asphalt placement.
 - b. Surface Preparation: surface shall be clean of all dirt, sand, oil or grease. Hose down entire area with a strong jet of water to remove all debris. Remove soft, loose, or otherwise damaged areas of asphalt concrete to full depth of damage and replace with compacted asphalt concrete as specified herein. Minor holes and imperfections may be patched using hot mix asphalt or mastic using sand/SS-1-H. Use wire brush for removal of oil and grease; prime with shellac or synthetic resin as recommended by manufacturer of pavement sealer material.
 - c. Seal Coat Seal Application: Thoroughly mix materials in the presence of the onsite inspector. Failure to do so will be cause for rejection. Apply in accordance with manufacturer's written instructions.
 - a. The minimum application rate for each applied coat shall be 30gals per 1000 sq. ft. Two coats of sealcoat will be required.
 - b. Clean-Up and Precautions: As recommended by pavement sealer material manufacturer.
 - d. Clean-Up and Precautions: As recommended by pavement sealer material manufacturer.
- C. Pavement Marking: painted pavement markings shall be done only after the seal coat has thoroughly dried. On clean surfaces to be painted with traffic paint of dust, dirt, grime, oil, rust or other contaminants which will impair the quality of work or interfere with proper bond of paint coats. Surfaces shall be cleaned to the extent and by whatever means that will satisfactorily accomplish the purpose without damage to asphalt concrete. Provide measured layouts, temporary markings, templates, and other means necessary to provide required marking. Prepare and apply paint in accordance with manufacturer's instructions; paint shall be applied by spray and shall achieve complete coverage free from voids and thin spots. Where indicated on the Drawings, paint parking stall strips, lettering, arrows, accessible symbols, playground markings, game striping, maps, etc. on concrete paving or asphalt concrete paving. Paint stripes shall be 4 inches wide (except otherwise indicated) and applied with two (2) coats of herein specified Traffic Line Paint; white (except as otherwise specified or indicated).
 1. International Accessible Symbol: Symbol shall be white figures on a blue background. Blue shall be equal to color No. 15090 in Fed. Std. 595c. Lines and symbols shall be accurately formed and true to line and form; lines shall be straight and uniform in width. Painted edges shall be clean cut and free from raggedness, and corners shall be cut sharp and square. Tolerances: Apply striping within a tolerance 1/2 inch in 50 feet. Apply markings and striping to widths indicated with a tolerance of 1/4 inch on straight sections and 1/2 inch on curved sections.

ASPHALT CONCRETE PAVING
SECTION 32 1200
3595001000

- D. Colors: As directed by Architect
- E. Precast Concrete Bumpers: Install where shown, using steel dowels, and epoxy applied for length to wheel stop without damage to bumpers or asphalt concrete paving.

3.4 CLEANING

- A. Upon completion of work of this Section promptly remove from the working area all scraps, debris and surplus material of this Section.
- B. Clean excess material from surface of all concrete walks and utility structures.

END OF SECTION

*s:\master specifications\division 32 - site improvements\32 1200_asphalt concrete paving.docx
Received from WCEI: December 18, 2020, Format Updated 9-8-21*

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Concrete curbs and gutters.
2. Concrete pavement, sidewalks and ramps.
3. Steel reinforcing for flatwork and curbs.
4. Truncated domes.

1.2 RELATED REQUIREMENTS

- A. Section 01 6116, Volatile Organic Compound (VOC) Restrictions; for VOC limits pertaining to adhesives, sealants, fillers, primers, and coatings.
- B. Section 01 8113, Sustainable Design Requirements, for CAL-Green **[and Collaborative for High Performance Schools (CHPS)]** general requirements and procedures.
- C. Division 31, Earthwork.
- D. Section 32 1200, Asphalt Concrete Paving.

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CALGreen), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- C. American Concrete Institute (ACI):
1. 117: Specification for Tolerances for Concrete Construction and Materials and Commentary.
 2. 211.1: Standard Practice for Selecting Proportions for Normal, Heavyweight and Mass Concrete.
 3. 301: Specifications for Structural Concrete.
 4. 302.1R: Guide to Concrete Floor and Slab Construction.
 5. 305R: Guide to Hot Weather Concreting.
 6. 306R: Guide to Cold Weather Concreting.
 7. 308R: Guide to External Curing of Concrete.
 8. 318: Building Code Requirements for Structural Concrete and Commentary.
 9. 347R: Guide to Formwork for Concrete.
- D. ASTM International (ASTM):

1. A615/A615M: Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement.
 2. A706/A706M: Standard Specification for Deformed and Plain Low-Alloy Steel Bars for Concrete Reinforcement.
 3. C33/C33M: Standard Specification for Concrete Aggregates.
 4. C94/C94M: Standard Specification for Ready-Mixed Concrete.
 5. C143/C143M: Standard Test Method for Slump of Hydraulic-Cement Concrete.
 6. C150/C150M: Standard Specification for Portland Cement.
 7. C260/C260M: Standard Specification for Air-Entraining Admixtures for Concrete.
 8. C309: Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete.
 9. C330/C330M: Standard Specification for Lightweight Aggregates for Structural Concrete.
 10. C494/C494M: Standard Specification for Chemical Admixtures for Concrete.
 11. C618: Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete.
 12. C920: Standard Specification for Elastomeric Joint Sealants.
 13. C1107/C1107M: Standard Specification for Packaged Dry, Hydraulic Cement Grout (Non-Shrink).
 14. C1315: Standard Specification for Liquid Membrane-Forming Compounds Having Special Properties for Curing and Sealing Concrete.
 15. D1751: Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types).
 16. D5893/D5893M: Standard Specification for Cold Applied, Single Component, Chemically Curing Silicone Joint Sealant for Portland Cement Concrete Pavements.
- E. Concrete Reinforcing Steel Institute (CRSI):
1. Manual of Standard Practice.
 2. Placing Reinforcing Bars.
- F. State of California, Department of Transportation (Caltrans):
1. Division of Engineering Services:
 - a. California Test 342: Method of Test for Surface Skid Resistance with the California Portable Skid Test.
 2. Standard Specifications.
 - a. Section 51, Concrete Structures.
 - b. Section 52, Reinforcement.
 - c. Section 73, Concrete Curbs and Sidewalks.
 - d. Section 90, Concrete.
- G. US Government General Services Administration (GSA/SAE):

1. GSA/SAE AMS-STD-595A: Colors Used In Government Procurement.

1.4 ADMINISTRATIVE REQUIREMENTS

A. Submittal Procedures:

1. Action Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
3. Sustainable Design Submittals shall comply with the additional requirements of Section 01 8113, Sustainable Design Requirements.

1.5 ACTION SUBMITTALS

A. Shop Drawings: Joint pattern layout for walks and pavement.

B. Product Data:

1. A complete list of materials proposed to be used for the site concrete work including, but not limited to, sand, gravel, admixtures, surface treatments, coloring agents, sealers, cast-in-place accessories, forming and curing products, concrete mix designs, reinforcing materials, joint materials, curing materials, and detectable warning surface.
2. Manufacturer's descriptive literature for products proposed for use. Include installation instructions, and maintenance instructions.

C. Concrete Mix Design: The Contractor shall submit three copies of each proposed mix design for each class of concrete in accordance with ACI 301, Sections 3.9 "Proportioning on the Basis of Previous Field Experience or Trial Mixture," or 3.10 "Proportioning Based on Empirical Data." The Contractor shall submit a separate mix design for concrete to be placed by pumping, in addition to the mix design for concrete to be placed directly from the truck chute.

1. The following information shall be included in the concrete mix design:
 - a. Proportions of cement, fine and coarse aggregate, and water.
 - b. Water-cement ratio, 28-day compressive design strength, slump, and air content.
 - c. Type of cement and aggregate.
 - d. Special requirements for pumping.
 - e. Range of ambient temperature and humidity for which design is valid.
 - f. Special characteristics of mix, which require precautions in mixing, placing, or finishing techniques to achieve specified finished product.
2. Do not begin concrete production until mixes have been reviewed and approved by Engineer.
 - a. Review of mix design by the Architect and Engineer shall in no way relieve the subcontractor of his responsibility for the performance of the concrete.

D. Qualification Data: For manufacturer

- E. Delivery tickets as specified for ready-mixed concrete.
- F. Sustainable Design:
 - 1. General:
 - a. Submit information necessary to establish and document compliance with the California Green Building Standards Code.
 - b. Sustainable design submittals are in addition to other submittals.
 - 2. The following information shall be provided:
 - a. Adhesives and Sealants: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.
 - b. Paints and Coatings: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.

1.6 CLOSEOUT SUBMITTALS

- A. Guarantee: Submit subcontractor's guarantee.

1.7 QUALITY ASSURANCE

- A. Qualifications:
 - 1. Manufacturer of ready-mixed concrete products shall meet ASTM C94/C94M requirements for production facilities and equipment.
- B. Design, erect, support, brace and maintain formwork and shoring to safely support all loads that might be applied until such loads can be carried by concrete.
- C. The Contractor shall perform work in accordance with ACI 301.
- D. Use only new materials and products.
- E. Single-Source Responsibility: Use materials and products of one manufacturer whenever possible.
- F. Materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.
- G. Testing to determine compliance with the work of this Section will be the responsibility of the Contractor.
 - 1. Cement and reinforcing shall be tested in accordance with CBC Section 1910A. Testing of reinforcing may be waived in accordance with Section 1910A.2 when approved by the Engineer and DSA.
 - 2. Testing will be performed by an independent testing and inspecting agency in accordance with Section 01 4523, Testing and Inspection Services, and paid for by the Owner.
 - 3. Refer to Article FIELD QUALITY CONTROL in Part 3 of this Section for additional requirements.

4. Cost of retests and coring due to low strength or defective concrete will be paid by the Owner and back-charged to the Contractor.
- H. Sieve analysis from testing laboratories identifying rock/sand percentages within the concrete mix; or class 2 aggregate base shall have the current Project name and Project location identified on the report. Outdated analytical reports greater than 90 days old will not be accepted.
- I. Mockups: Provide on-site mockup panels for each type of exposed colored concrete flatwork showing texture and color before proceeding with finish to be used on this Project.
 1. Construct sample panels after review and approval of samples.
 2. Size: Minimum 5 feet square and have at least one longitudinal and one transverse joint unless a more specific note indicates otherwise on Drawings.
 3. Construct sample panels at location approved by Architect.
 4. Construct sample panels in ample time to allow for finishing and curing before requesting Architect to review.
 5. Follow procedures used on accepted samples.
 6. Include saw-cut and tooled joints to match method and appearance proposed for use in completed work.
 7. Prepare successive sample panels as required until finish, color, and appearance is approved by Architect.
 8. Do not remove sample panels until authorized in writing by the Architect and all concrete work has been approved.

1.8 DELIVERY, STORAGE AND HANDLING

- A. Deliver undamaged products to job in manufacturer's sealed containers and/or original bundles with tags and labels intact.
- B. Store materials in protected, dry conditions off of ground and in areas so as to not interfere with the progress of the Work.
- C. Transport, store and handle in strict accordance with the manufacturer's written recommendations.
- D. Store cement in weather tight building, permitting easy inspection and identification. Protect from dampness. Lumpy or stale cement will be rejected.
- E. Aggregates: Prevent excessive segregation, or contamination with other materials or other sizes of aggregate. Use only one supply source for each aggregate stock pile.

1.9 FIELD CONDITIONS

- A. Make and be responsible for all field dimensions necessary for proper fitting, slopes, and completion of work. Report discrepancies to Architect before proceeding.
- B. Do not place concrete during rain without adequate protection.

- C. The Contractor shall conform to ACI 306R when mixing and placing concrete during cold weather. Provide sufficient protection when daily temperatures drop below 40 degrees F.
- D. The Contractor shall conform to ACI 305R when mixing and placing concrete during hot weather. When air temperature exceeds 100 degrees F adjust concrete mix with retarding admixture in design mix, and adequately test and take additional measures as directed by concrete supplier.
- E. The Contractor shall maintain access for vehicular and pedestrian traffic as required for other construction activities. Use temporary striping, flagmen, barricades, warning signs, and warning lights as required.
- F. Placing in hot weather: Comply with ACI 305R. Concrete shall be delivered, placed and finished in a sufficiently short period of time to avoid surface dry checking.
 - 1. Concrete shall not exceed 85 degrees F at time of placement.
 - 2. Concrete shall be kept wet continuously after tempering until implementation of curing compound procedure in accordance with this specification.
 - 3. Evaporation Retarder: Apply evaporation retarder to concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 pounds per square foot per hour, before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.
- G. Placing in Cold Weather: Comply with ACI 306R. Protect from frost or freezing. No antifreeze admixtures are permitted.
 - 1. When placing concrete during freezing or near-freezing weather, mix shall have temperature of at least 50 degrees F but not more than 90 degrees F.
 - 2. Concrete shall be maintained at temperature of at least 50 degrees F for not less than 72 hours after placing or until it has thoroughly hardened.
 - 3. Provide necessary thermal coverings for any flat work exposed to freezing temperatures.

PART 2 - PRODUCTS

2.1 DESIGN AND PERFORMANCE CRITERIA

- A. Contractor shall comply with requirements applicable to this Section for concrete materials, admixtures, bonding materials, curing materials, surface sealers and others as required.
- B. Concrete walking surfaces shall have a coefficient of friction not less than 0.30 and will be subject to testing to verify compliance as specified in Article FIELD QUALITY CONTROL.
 - 1. The coefficient of friction will be measured by California Test 342 before pavement is opened to public traffic, but not sooner than 7 days after concrete placement.

2. Contractor shall notify the Architect and Project Inspector of pavement having a coefficient of friction less than 0.30.
- C. Sustainable Design:
1. VOC emissions for field-applied adhesives, sealants, and sealant primers must comply with limits specified in Section 01 6116.
 2. VOC emissions for field-applied paints and coatings must comply with limits specified in Section 01 6116.

2.2 FORMING MATERIALS

- A. Form Material: Steel, wood, or other suitable material of size and strength to resist movement during concrete placement and to retain horizontal and vertical alignment until removal. Use straight forms, free of distortion and defects. Use flexible spring steel forms or laminated boards to form radius bends as required. The forms shall be of a depth equal to the depth of curbing or sidewalk, and so designed as to permit secure fastening together at the tops. Coat forms with non-staining type coating that will not discolor or deface surface of concrete.
1. Concrete Exposed to View: 5/8-inch minimum APA B-B Plyform, steel or "Sonotube" forms by Sunoco, 888-875-8754, or equal.
 2. Concrete Concealed from View: 5/8-inch minimum APA B-B Plyform, steel or 1 x 8 DF, Number 2 Grade or better.
- B. Form Ties: Snap off metal of fixed length, leaving no metal within 1-1/2 inches of surface and no fractures, spalls or other surface defects larger than 1 inch diameter; manufactured by Burke, Dayton Superior, or equal.
- C. Spreaders: Metal. Wood is not permitted.
- D. Form Coating: Coat forms with non-staining material that will not discolor or deface surface of concrete or leave any residue on concrete that would interfere with surface coating as approved by the Architect.
- E. Chamfer Strips: Rigid polyvinyl chloride, 3/4-inch x 3/4-inch, in maximum possible lengths, manufactured by Burke, Greenstreak, Vulco, or equal.

2.3 REINFORCING MATERIALS

- A. Reinforcement Bars: New billet steel deformed bars conforming to requirements of ASTM A615/A615M or ASTM A706/A706M; Grade 60.
1. Bars for dowels installed through expansion joints or construction joints to existing sidewalks or concrete features shall be smooth or if deformed shall be sleeved on one end for slippage.
- B. Reinforcing Supports: Galvanized metal chairs or spacers or metal hangers, accurately placed 3 feet on center each way, staggered, with each support securely fastened to steel reinforcement in place.

1. Bottom bars in footings may be supported with 3-inch concrete blocks with embedded wire ties.
2. Concrete supports without wire ties will not be allowed.

2.4 CONCRETE MATERIALS

- A. Cement: Portland cement in accordance with ASTM C150/C150M, Type II, low alkali.
- B. Concrete Aggregates: Graded from coarse to fine in accordance with ASTM C33/C33M.
 1. Normal Weight Aggregates: Clean and free from deleterious coatings, clay balls, roots, and other extraneous materials, and in conformance with ASTM C33/C33M, except as otherwise specified. Combined grading shall meet limits of ASTM C33/C33M.
 - a. Size: Not be larger than one-fifth of the narrowest dimension between forms, or larger than three-fourths of the minimum clear spacing between reinforcing bars.
 2. Lightweight Aggregates:
 - a. General: Durable particles suitably processed, washed and screened without adherent coatings, free of materials with deleterious reactivity to alkali in cement, and conforming to ASTM C330/C330M.
 - b. Fine aggregate shall be natural sand, or sand prepared from stone or gravel, with grains free of silt, loam and clay.
- C. Water: Potable, clean, and in accordance with ASTM C94/C94M, free from injurious amounts of oil, acids, alkalis, salts, scale, organic materials or other deleterious matter, and in compliance with ACI 318 Section 26.4.1.3.
- D. Fly Ash: Western Fly Ash, conforming to ASTM C618 for Class N or Class F materials and in accordance with CBC Section 1903A.6.
 1. Class C is not permitted.
 2. Proportions: Not more than 15 percent (by weight) may be substituted for portland cement.

2.5 ADMIXTURES

- A. Water Reducing Admixture: Admixture to improve placing, reduce water cement ratio and ultimate shrinkage; "WRDA 64" by GCP Applied Technologies, or equal conforming to ASTM C494/C494M and ACI 318 Section 3.6.
 1. Water reducing admixture may be used subject to prior approval by the Architect, Engineer, and the Testing Lab.
 2. Proposed product and quantity shall be included in original design mix.
- B. Air-Entraining Admixture: "Daravair 1000" by GCP Applied Technologies or equal conforming to ASTM C260 and ACI 318, section 26.4.1.4.
 1. Proportion air entraining concrete to attain specified minimum 28-day compressive strength.

2. Total air entrainment in concrete shall be not less than 4 percent or more than 6 percent of the volume of concrete.
- C. Glare Reduction Colorant: Concentrated pigment dispersions designed to permanently color concrete; "Chromix L10 Base-Black" by Sika Corporation, or equal. *Was within 2.2 H.1*

2.6 CURING MATERIALS

- A. Clear Curing Compound: Water-based membrane-forming concrete curing compound in accordance with ASTM C309 and C1315; "Aqua Resin Cure Clear" by Burke CO, "1100" by W.R. Meadows, or equal.

2.7 ADDITIONAL MATERIALS AND COMPONENTS

- A. Concrete Bonding Agent: The following, or equal, conforming to ASTM C1059/C1059M.
 1. "Weld-Crete" by Larson Products Corporation, 800-633-6668.
 2. "Daraweld C" by GCP Applied Technologies, 877-423-6491.
- B. Patching Mortar: One-component, trowel applied, migrating-corrosion-inhibitor enhanced, polymer-modified, shrinkage-compensated, fiber reinforced, micro-silica enhanced, cementitious repair mortar for horizontal, vertical, and overhead applications; "Meadow-Crete GPS" by W.R. Meadows, or equal.
- C. Non-Shrink Grout: Premixed, non-metallic, no chlorides, non-staining and non-shrinking conforming to ASTM C1107/C1107M; "MasterFlow 713" by Master Builders Solutions, a division of BASF, 800-433-9517, or equal.
- D. Drainage Rock Base: 3/4-inch aggregate size conforming to Class 2 Aggregate Base as defined in Caltrans Standard Specifications Section 26, or equal clean free-draining gravel or crushed rock as recommended by the Geotechnical Engineer.
- E. Expansion Joint Material: Preformed 3/8-inch fiber material, with bituminous binder manufactured for use as concrete expansion joint material and conforming to ASTM D1751 and approved by Architect.
 1. Furnish joint fillers in one-piece lengths for full width being placed, wherever possible. Where more than one length is required, lace or clip joint-filler sections together.
- F. Joint Sealant for Expansion Joints in Concrete: Weather and UV resistant, single component, cold applied silicone sealant, Type S, conforming to ASTM D5893/D5893M; ASTM C920, Grade P, Class 25, Use T.
 1. Self-Leveling: "DOWSIL 890-SL Silicone Joint Sealant" by Dow Chemical Company, or equal.
 2. At Slopes Exceeding 5 Percent: Non-sagging; "DOWSIL 888 Silicone Joint Sealant" by Dow Chemical Company, or equal.
 3. Color: As standard with manufacturer.

- G. Pre-Formed Plastic Expansion Joint Caps: Polystyrene, with removable tops; "Snap Cap" by W. R. Meadows, Tex-Trude expansion caps, or equal.
- H. Truncated Domes: Vitrified Polymer Composite (VPC) cast-in-place detectable/tactile warning surface tiles complying with Americans with Disabilities Act (ADA) and the California Code of Regulations (CCR) Title 24, Part 2, Chapter 11B; "Armor-Tile", "Access Tile Tactile Systems," or equal.
 - 1. Color: Shall be yellow and approximate 33538 of GSA/SAE AMS-STD-595A in accordance with CBC Section 11B-705.1.1.3.1.
- I. Traffic Paint for Accessibility Striping at Stairs: VOC compliant, water-based, vinyl acrylic copolymer fast drying emulsion and specifically formulated as a traffic marking paint; "Setfast" with "Duckback" abrasive additive by Sherwin-Williams, "SAFE-STRIDE" by Wooster Products, Inc., or equal.
 - 1. Colors: As selected by Architect. [Yellow]
- J. Cast Abrasive Accessibility Strips and Stairs: Extruded aluminum with integral anchor and filled with abrasive granules in epoxy binder; Model ST-SF-N by Nystrom, Inc., 800-547-2635, Type T-24 by American Safety Tread Company, Inc., 800-245-4881, Type WP-24A by Wooster Products, Inc., 330-264-2844, or equal.
 - 1. Colors: As selected by Architect. [Yellow]

2.8 CONCRETE DESIGN AND CLASS

- A. Designed Strength and Classes of Concrete: The following mixes are not applicable to concrete items exceeding 4 feet in height above the adjacent grade.
 - 1. Class "B": Concrete shall have 1 inch maximum size aggregate, shall have 3000 pounds per square inch minimum at 28 day strength with a maximum water to cementitious ratio no greater than 0.50.
 - a. Location of Use: Exterior slabs, including walks, vehicular paved surfaces, manhole bases, poured-in-place drop inlets, curbs, valley gutters, curb and gutter, and other concrete of like nature.
 - 2. Class "D" concrete of 1 inch maximum size aggregate shall have 3500 pounds per square inch 28 day strength with a maximum water to cementitious materials ratio of 0.55.
 - a. Location of Use: Footings and retaining walls not attached to buildings, and planter walls, monument signs, and other site concrete not described for use in Class "B".
- B. Slump Limits: Provide concrete, at point of final discharge of proper consistency as tested in accordance with ASTM C143/C143M with slumps of 4 inches, plus or minus 1 inch.
- C. Mix Design: Concrete shall be designed for strength in accordance with provisions of CBC Section 1905A.

1. Should the Contractor desire to pump concrete, a modified mix design will need to be submitted for review.
 2. Fly ash may be used in concrete to improve workability in amounts up to 15 percent of the total cementitious weight.
- D. Air Entrainment: Provide at concrete paving / flatwork, including concrete ramps and stairs in accordance with local jurisdiction minimum requirements, but no less than 3 percent of the volume of concrete.
- E. Glare Reduction Additive:
1. General:
 - a. Provide at exterior concrete slabs, walks, ramps, stairs, including bleachers, and other exposed flatwork to eliminate glare.
 - b. Omit glare reduction colorant where color hardener, integral color, and stain treatment of concrete are scheduled.
 2. Quantity: As required to match approved sample but not exceed 2 pounds of colorant per cubic yard of concrete.
 3. Add colorant to mix in accordance with manufacturer's printed instructions.
- F. Coloring Agent:
1. Quantity: Add pigment as required to result in hardened concrete color consistent with approved sample but not exceeding maximum dosage per sack of cement as recommended by manufacturer based on total cementitious materials of mix design.
 2. Add pre-mixed colorant bags to mix in accordance with manufacturer's printed instructions.

2.9 MIXING OF CONCRETE

- A. Conform to requirements of CBC Chapter 19A.
- B. Concrete shall be mixed until there is uniform distribution of material and mass is uniform and homogenous; mixer must be discharged completely before the mixer is recharged.
- C. Concrete shall be Ready-Mixed Concrete: Mix and deliver in accordance with the requirements set forth in ASTM C94/C94M and ACI 301. Batch Plant inspection may be waived in accordance with CBC Section 1705A.3.3, when approved by the Project Engineer and DSA.
1. Furnish batch certificates for each batch discharged and used in the work.
 2. Approved Testing Laboratory shall check the first batching at the start of the work and furnish mix proportions to the Licensed Weighmaster.
 3. Licensed Weighmaster shall identify materials as to quantity and to certify to each load by ticket.
 4. Delivery tickets are to accompany each truck and shall be kept in the job superintendent's file. Delivery tickets must indicate the following information or be subject to rejection:

- a. Name of Project.
 - b. Supplier of concrete.
 - c. Truck identity and ticket serial number.
 - d. Date of delivery.
 - e. Brand of cement.
 - f. Cement content.
 - g. Strength classification.
 - h. Batching time.
 - i. Point of deposit.
 - j. Total amount of water.
 - k. Weight of aggregate.
 - l. Daily temperature.
 - m. Number of cubic yards in load.
 - n. Admixture content.
 - o. Name of Contractor.
 - p. Name of driver.
 - q. Time loaded and first mixing of concrete.
 - r. Reading of revolution counter.
 - s. Color additive.
5. Ticket shall be transmitted to Project Inspector by truck driver with load identified thereon. Project Inspector will not accept load without load ticket identifying mix and will keep daily record of pours, identifying each truck, its load and time of receipt, and will transmit two copies of record to DSA.
6. At end of project, Weighmaster shall furnish affidavit to DSA on form satisfactory to DSA, certifying that all concrete furnished is in conformance with proportions established by mix designs.
7. Placement of concrete shall occur as rapidly as possible after batching and in a manner which will assure that the required quality of the concrete is maintained. In no case may concrete be placed more than 90 minutes from batch time.
- a. When air temperature is between 85 and 90 degrees F, reduce maximum batching to discharge time from 90 minutes to 75 minutes.
 - b. When air temperature is above 90 degrees F, reduce maximum batching to discharge time to 60 minutes.
8. Water may be added to the mix only if neither the maximum permissible water-cement ratio nor the maximum slump is exceeded.
- a. The quantity of water used for each batch shall be accurately measured.
 - b. In no case shall more than 10 gallons of water be added to a full 9-yard load, or 1 gallon per yard on remaining concrete within the drum, providing load tag indicates at time of mixing at plant an allowance for additional water.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Confirm general layout, grade, and joint pattern layout with the Architect prior to placing concrete.
- B. Verify that gradients and elevations of the base are correct, and that the base is dry.
- C. Contractor shall report in writing to the Architect prevailing conditions that will adversely affect satisfactory execution of the work of this Section.
 - 1. Do not proceed with work until unsatisfactory conditions have been corrected.
- D. Forms and reinforcements are subject to approval by the Project Inspector as specified in Article FIELD QUALITY CONTROL.

3.2 PREPARATION

- A. Remove frost, water, and other foreign materials from form surfaces, reinforcement, and embedded items against which concrete will be placed.
- B. When the ambient temperature necessitates the use of cold or hot weather concreting, make provisions in advance of concrete placement.
- C. Before placing concrete, clean tools and equipment, and remove debris from areas to receive concrete.
- D. Clean reinforcing and other embedded items of coatings, oil, mud and soil that may impair bond with concrete.
- E. Slab-On-Grade: After subgrade has been approved by Geotechnical Engineer, install specified drainage rock base material to thickness shown. Rock base shall be implemented and compacted in accordance with the Geotechnical Report and recommendations of the Geotechnical Engineer.

3.3 INSTALLATION – FORMWORK

- A. Form material shall be straight, true, sound and able to withstand deformation due to loading and effects of moist curing. Materials which have warped or delaminated, or require more than minor patching of contact surfaces, shall not be reused.
- B. Build forms to shapes, lines, grades and dimensions indicated. Construct formwork to maintain tolerances required by ACI 301. Forms shall be substantial, tight to prevent leakage of concrete, and properly braced and tied together to maintain position and shape. Butt joints tightly and locate on solid backing. Chamfer corners where indicated. Form bevels, grooves and recesses to neat, straight lines. Construct forms for easy removal without hammering, wedging or prying against concrete.
- C. Space clamps, ties, hangers and other form accessories so that working capacities are not exceeded by loads imposed from concrete or concreting operations.

- D. Build openings into vertical forms at regular intervals if necessary to facilitate concrete placement, and at bottoms of forms to permit cleaning and inspection.
- E. Build in securely braced temporary bulkheads, keyed as required, at planned locations of construction joints.
- F. Before placement of reinforcing steel, coat faces of all forms to prevent absorption of moisture from concrete and to facilitate removal of forms. Apply specified material in conformance with manufacturer's written directions.
 - 1. Seal all cut edges.
 - 2. Before re-using form material, inspect, clean thoroughly, and recoat.
- G. Slope tie-wires downward to outside of wall.
- H. Brace, anchor and support all cast-in items to prevent displacement or distortion.
- I. During and immediately after concrete placing, tighten forms, posts and shores. Readjust to maintain grades, levels and camber.
- J. Concrete Paving, Curbs, Curb and Gutters, Ramps:
 - 1. Expansion Joints: Install at locations indicated, and so that maximum distance between joints is 20 feet for exterior concrete unless otherwise shown. Expansion joint material shall be full depth of concrete section. Recess for snap cap and sealant when required.
 - 2. Curbs, Valley Gutter, and Curb & Gutter: Install expansion joints at 60 feet on center, except when placing adjacent to concrete walks, the expansion joints shall align with the expansion joints shown for the concrete walks. Expansion joint material shall be full depth of concrete section. Recess for snap cap and sealant when required.
 - 3. Isolation Joints: 3/8-inch felt between walls and exterior slabs or walks so that paved areas are isolated from all vertical features, unless specifically noted otherwise on plans.
 - 4. Exterior Concrete Paving: Install expansion joints at 20 feet on center maximum, both directions, unless shown otherwise on plans.
 - 5. Ramps: Whether shown or not, all ramps shall have control joints and expansion joints.
 - a. Control joints on ramps shall be aligned and placed in between the vertical posts for the handrails. The curbs, if required shall have control joints that align with the handrail posts.
 - b. Expansion joints shall be placed at the upper, intermediate, and bottom landings.
- K. Inspection: Refer to Article FIELD QUALITY CONTROL.

3.4 INSTALLATION – REINFORCING

- A. General: Reinforcing shall be accurately placed at locations indicated on the drawings within required tolerances and providing required clearances. Reinforcement shall be

secured prior to placement of concrete such that tolerances and clearances are maintained. Coverage shall be in accordance with Section 1907A.7 of the CBC.

1. Reinforcement must be in place before concreting is begun.
 2. Keep a person on the job to maintain position of reinforcing as concrete is placed.
 3. All expansion and construction joints in concrete shall have dowels of size and spacing as shown on the Drawings, or as approved by Architect.
 4. Give notice whenever pipes, conduits, sleeves, and other construction interferes with placement; obtain method of procedure to resolve interferences.
- B. Additional reinforcing steel shall be placed around all utility boxes, valve boxes, manhole frames and covers that are located within the concrete placements.
1. The bars shall be placed so that there will be a minimum of 1-1/2-inch clearance and a maximum of 3-inch clearance. The reinforcing steel shall be placed mid-depth of concrete slab.
- C. At right angles or intersections of concrete walks, additional 2 feet x 2 feet #5, 90 degree bars shall be added at all inside corners for additional crack control. The bars shall be placed 2 inches from concrete forms and supports, at mid-depth of slab.
- D. Reinforcing steel shall be adequately supported by approved devices on centers close enough to prevent any sagging.
- E. Placing Tolerances:
1. In accordance with ACI 301 or CRSI/WCRSI Recommended Practice for Placing Reinforcing Bars, unless otherwise shown.
 2. Clear distance between parallel bars in a layer shall be no less than 1 inch, the maximum bar diameter shall not exceed 1-1/2 times the maximum size of coarse aggregate.
- F. Splices:
1. General: Unless otherwise shown on drawings, splice top reinforcing at midspan between supports, splice bottom reinforcing at supports, and stagger splices. Bar laps shall be wired together. Reinforcing steel laps shall be as follows:
 - a. Length of Lap Splices in Concrete:
 - 1) No. 4 bar: 24 inches minimum.
 - 2) No. 5 Bar: Not less than 62 bar diameters.
 - 3) No. 6 Bar: 56 inches minimum.
 - 4) No. 7 Bars and Larger: Not less than 93 bar diameters.
 - b. All splices shall be staggered at 5 feet minimum from adjacent splices.
- G. Inspection: Refer to Article FIELD QUALITY CONTROL.

3.5 PLACING OF CONCRETE – GENERAL

- A. Adjacent finish surfaces shall be protected at all times during the concrete pour and finishing. Verify that all formwork is tight and leak-proof before concrete is poured. Finish work defaced during the concrete pour and finishing shall be replaced at no extra cost to Owner.
- B. Remove wood chips, sawdust, dirt, loose concrete and other debris just before concrete is to be poured. Use compressed air for inaccessible areas. Remove all standing water from excavations.
- C. Transport concrete from mixer to place of final deposit as rapidly as practicable by methods which will prevent separation or loss of ingredients. Deposit as close as practicable in final position to avoid re-handling or flowing. Partially hardened concrete must not be deposited in work. Concrete shall not be wheeled directly on top of reinforcing steel.
- D. Keep excavations free of standing water, but moisture condition sub-grade before concrete placement.
- E. Placing: Once started, continue concrete pour continuously until section is complete between predetermined construction joints. Prevent splashing of concrete onto adjacent forms or reinforcement and remove such accumulation of hardened or partially hardened concrete from forms or reinforcement before work proceeds in that area. Free fall of concrete shall not to exceed 4'-0" in height. If necessary, provide lower openings in forms to inject concrete and to reduce fall height.
- F. Remove form spreaders as placing of concrete progresses.
- G. Place footings as monolithic and in one continuous pour.
- H. Compacting: Concrete shall be compacted by mechanical vibrators.
 - 1. Concrete shall be thoroughly worked around reinforcement and embedded fixtures and into corners of forms.
 - 2. Vibrating shall not be applied to concrete which has already begun to initially set or be continued so long as to cause segregation of materials.

3.6 REMOVAL OF FORMS

- A. Remove without damage to concrete surfaces.
 - 1. Sequence and timing of form removal shall insure complete safety of concrete structure.
 - 2. Forms shall remain in place for not less than the following periods of time. These periods represent cumulative number of days during which temperature of air in contact with concrete is 60 degrees F and above.
 - a. Vertical Forms of Foundations, Walls and All Other Forms Not Covered Below: 5 days.
 - b. Concrete Paving Edge Screeds or Forms: 7 days.

3. Concrete shall not be subjected to superimposed loads (structure or construction equipment) until it has attained its full design strength and not for a period of at least 21 days after placing. Concrete systems shall not be subjected to construction loads in excess of design loads.
- B. Patching: Install specified patching mortar per manufacturer's recommendations. Repairs to defective concrete which affect the strength of any structural concrete member or component are subject to approval by the architect and DSA.

3.7 CONCRETE PAVING

- A. Concrete paving shall be formed and finished to required line and grades true and flat with a maximum tolerance of 1/8-inch in 10 feet for flatness and to slopes indicated.
- B. Concrete vibrator shall be used to assist concrete placement. Contractor shall have spare concrete vibrator on site during concrete placement.
- C. Thoroughly water and soak the subgrade of exterior concrete paving, curbs, curb and gutters, with multiple daily waterings for at least three days or as required to achieve required moisture content prior to the concrete pour in order to place the subgrade soils in full expansion.
 1. Provide damming as required to keep standing water within the formed area and to allow for proper saturation and full expansion of the subgrade soils.
 2. Remove standing water before concrete placement.
- D. Construction Joints:
 1. Keep exposed concrete face of construction joints continuously moist from time of initial set until placing of concrete; thoroughly clean contact surface by chipping entire surface not earlier than 5 days after initial pour to expose clean hard aggregate solidly embedded, or by approved method that will assure equal bond, such as green cutting.
 2. If contact surface becomes contaminated with soil, sawdust or other foreign matter, clean entire surface and re-chip entire surface to assure proper adhesion.

3.8 FINISHING

- A. Concrete Paving: Finish surface as required by ACI 302.1R using manual and vibrating screeds to place concrete level and smooth.
 1. Under no circumstances shall water be added to the top surface of freshly placed concrete.
 2. Use "jitterbugs" or other special tools designed for the purpose of forcing the course aggregate below the surface leaving a thick layer of mortar 1 inch in thickness.
 3. After tamping the concrete, wood float surface to a true and even plane.
 4. After floating with a wood bull float, make 2 passes with a steel Fresno trowel to start sealing the concrete surface.

5. While concrete is still wet but sufficiently hardened to bear a persons' weight on knee boards, start troweling with a steel hand trowel or a machine trowel in larger areas. Use sufficient pressure to bring moisture to surface.
 6. After surface moisture has disappeared, finish concrete utilizing steel, hand or power trowel.
 7. Completed surface shall be free from trowel marks, depressions, ridges or other blemishes. Tolerance for flatness shall be 1/8-inch in 10 feet.
 8. Provide final finish as follows, unless otherwise indicated:
 - a. Medium Broom Finish: Typical finish to be used at all exterior walks, stairs and ramps. Brooming direction shall run perpendicular to slope to form non-slip surface.
- B. Curb Finish: Steel trowel.
- C. Joints and Edges:
1. Mark-off exposed joints, where indicated, with 1/4-inch radius x 1 inch deep jointer or edging tool. Joints shall be clean, cut straight and parallel or square with respect to concrete walk edge.
 2. Tool edges of control joints, walk edges, and wherever concrete walk adjoins other material or vertical surfaces. Expansion joints shall be constructed as detailed on plans.
 3. The expansion joints shall be full depth as shown in the Drawings. Failure to do so will result in non-compliance and shall be immediately machine cut by the Contractor at its expense.

3.9 CURING

- A. Formed Concrete:
1. Keep forms and top on concrete between forms continuously wet until removal of forms, 7 days minimum.
 2. Maintain exposed concrete in a continuous wet condition for 14 days following removal of forms.
- B. Concrete Paving, Curb, Curb and Gutter, Valley Gutter:
1. Cure utilizing curing compound. If applicable, the Contractor shall verify that the approved curing compound is compatible with the approved colorant system.
 2. Curing compound shall be applied in a wet puddling application. Spotty applications shall be reason for rejection and possibly concrete removal and replacement at the contractor's expense with no compensation from the Owner.
- C. No curing compound shall be applied to areas scheduled to receive resilient track surface including, curbs, ramps, runways, and similar items.

3.10 DEFECTIVE CONCRETE

- A. General:

1. Determination of defective concrete shall be made by the Architect or Engineer whose opinion shall be final in identifying areas to be replaced, repaired or patched.
2. As directed by Architect, cut out and replace defective concrete.
 - a. Defective concrete shall be removed from the site.
 - b. No patching is to be done until surfaces have been examined by Architect and permission to begin patching has been provided.
 - c. Permission to patch an area shall not be considered waiver of right by the Owner to require removal of defective work, if patching does not, in opinion of Architect, satisfactorily restore quality and appearance of surface.
 - d. Remove and replace concrete if repair to an acceptable condition is not feasible.

B. Defective Concrete Is:

1. Concrete that does not match the approved mix design for the given installation type.
2. Concrete not meeting specified 28-day strength.
3. Concrete which contains rock pockets, voids, spalls, transverse cracks, exposed reinforcing, or other such defects which adversely affect strength, durability or appearance.
4. Concrete which is incorrectly formed, out of alignment or not plumb or level, or outside of the maximum tolerance for flatness and slopes indicated.
5. Concrete containing embedded wood or debris.
6. Concrete having large or excessive patched voids which were not completed under Architect's direction.
7. Concrete not containing required embedded items.
8. Concrete with excessive shrinkage, transverse cracking, crazing, curling; or defective finish.
9. Concrete that is unsuitable for placement or has set in truck drum for longer than 90 minutes from the time it was batched.
10. Concrete where expansion joint filler that is not isolating the full depth of the concrete section, and not recessed as required for backer rod and sealant where required.
11. Concrete that is excessively wet or excessively dry and will not meet the minimum or maximum slump required per mix design.
12. Finished concrete with oil stains from equipment use, and or rust spots that cannot be removed.
13. Concrete with control joints (weakened planed joints) that do not meet the required minimum depth shown on the drawings.
14. Concrete not meeting slip-resistance requirements.

C. Flatwork: The Owner reserves the right to survey the flatwork, to determine if flatwork is outside of the maximum tolerance for flatness and slopes as indicated.

1. If the flatwork is found to be out of tolerance, then the Contractor is required to replace concrete at no additional expense to the Owner.
2. Determination of flatwork flatness, surveying and remedial work must be completed far enough in advance so that the project schedule is maintained, delays are avoided, and the new flatwork or flatwork repairs are properly cured.
3. The Contractor will be responsible for reimbursing the Owner for costs associated with re-surveying to verify compliance of work remediated by the Contractor.

3.11 SEALANT

- A. Apply sealant in compliance with manufacturer's instructions, using hand guns or pressure equipment with proper nozzle size, on clean, dry, properly prepared substrates.
- B. Force sealants into joint against sides of joint to make uniform. Avoid pulling of the sealant from the sides. Fill sealant space completely with sealant.
- C. Finished joints shall be straight, uniform, smooth, and neatly finished.
- D. Remove any excess sealant from adjacent surfaces of joints utilizing the manufacturer's recommended solvent and cleaning processes. Leave the work in a neat, clean condition.

3.12 FIELD QUALITY CONTROL

- A. Inspection of Forms and Reinforcing:
 1. Approval of forms and reinforcing steel must be received from Project Inspector prior to pouring concrete.
 2. Notice of readiness to place first pour shall be given to Project Inspector, DSA, Architect, and Engineer not less than 48 hours prior to placement of concrete to allow for inspection.
 3. Pouring of concrete shall not proceed prior to completing requested adjustments to forms and reinforcing and without approval of Project Inspector.
- B. Testing of Concrete:
 1. Frequency and Samples for Testing:
 - a. Four identical cylinder samples for strength tests of each class of concrete placed each day shall be taken not less than once a day, or not less than once for each 50 cubic yards of concrete, or not less than once for each 2,000 square feet of surface area for slabs or walls.
 - b. In addition, samples for strength tests for each class of concrete shall be taken for seven-day tests at the beginning of the concrete work or whenever the mix or aggregate is changed.
 2. Testing:
 - a. Slump: Each truck's concrete shall be tested for slump before concrete is placed.
 - b. Strength:

- 1) Tests for strength will be conducted by Testing Agency on one cylinder at 7 days and two cylinders at 28 days. The fourth remaining cylinder will be available for testing at 56 days if the 28-day cylinder test results do not meet the required design strength.
 - 2) On a given project, if the total volume of concrete is such that the frequency of specified testing would provide less than five strength tests for a given class of concrete, tests shall be made from at least five randomly selected batches or from each batch if fewer than five batches are used.
- C. Slip-Resistance Testing: Owner's Testing Agency will perform testing on flatwork to verify compliance with specified slip-resistance.
1. The coefficient of friction will be measured by California Test 342 before pavement is opened to public traffic, but not sooner than 7 days after concrete placement
 2. Where paving is determined to have a coefficient of friction less than 0.30, Contractor is to repair and/or replace these surfaces at no cost to Owner.

3.13 CLEANING

- A. Upon completion of work of this Section promptly remove from the working area all scraps, debris and surplus material of this Section.
- B. Clean excess material from surface of all concrete walks and utility structures.
- C. Power wash concrete surfaces to remove stains, dried mud, tire marks, and rust spots.
- D. Comply with any additional requirements of additive manufacturer for colored concrete.

3.14 PROTECTION

- A. Graffiti-resistant Coating:
 1. Surface Preparation: Prepare concrete surface to receive graffiti-resistant coating specified in Section 09 9623, Graffiti-Resistant Coatings, where indicated.
 2. Concrete must be clean, dry, and free of efflorescence and dust.
- B. Protect work and materials of this Section prior to and during installation, and protect the installed work and materials of other trades.
- C. In the event of damage during construction, make all repairs and replacements necessary to the approval of the Architect, at no additional cost to the Owner.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Chain link fences
 - 2. Gates and gate hardware.

1.2 RELATED REQUIREMENTS

- A. Section 01 6116, Volatile Organic Compound (VOC) Restrictions, for VOC limits pertaining to adhesives, sealants, fillers, primers, and coatings.
- B. Section 01 8113, Sustainable Design Requirements, for CAL-Green general requirements and procedures.
- C. Section 32 1600, Site Concrete.
- D. Section 08 7100, Door Hardware, for padlocks.

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CAL Green), edition as noted on the drawings, as adopted by the California Division of the State Architect (DSA).
- C. Chain Link Fence Manufacturers' Institute (CLFMI):
 - 1. Products Manual.
- D. ASTM International (ASTM):
 - 1. A153: Zinc Coating (Hot Dip) on Iron and Steel Products.
 - 2. A392: Zinc Coated Steel Chain Link Fence Fabric.
 - 3. A653/A653M: Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
 - 4. A780/A 780M: Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings.
 - 5. C33/C33M: Standard Specification for Concrete Aggregates.
 - 6. C94: Ready-mixed Concrete.
 - 7. C150/C150M: Standard Specification for Portland Cement.
 - 8. F668: Poly Vinyl Chloride (PVC) Coated Steel Chain Link Fence Fabric.
 - 9. F934: Standard Colors for Poly Vinyl Chloride (PVC) Coated Chain Link.
 - 10. F969: Standard Practice for Construction of Chain-Link Tennis Court Fence.

CHAIN LINK FENCES AND GATES
SECTION 32 3113
3595001

11. F1083: Pipe, Steel, Hot-Dipped Zinc Coated (Galvanized) Welded, for Fence Structures.

1.4 ADMINISTRATIVE REQUIREMENTS

A. Submittal Procedures:

1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
3. Sustainable Design Submittals shall comply with the additional requirement of Section 01 8113, Sustainable Design Requirements.

1.5 ACTION SUBMITTALS

- A. Shop Drawings: Submit showing all parts, connections and anchorages, adjacent materials, fully dimensioned and noted. Indicate plan layout, spacing of components, post foundation dimensions, hardware anchorage and schedule of components.
- B. Products Data: Submit list and complete descriptive data of all products proposed for use. Include manufacturer's specifications, published warranty or guarantee, installation instructions, and maintenance instructions.
- C. Samples:
1. Chain-link fabric, approximately 12 inches square, in selected color.
 2. Hardware and fittings if requested by Architect.

1.6 INFORMATIONAL SUBMITTALS

- A. Sample of manufacturer's warranty.
- B. Sustainable Design:
1. General:
 - a. Submit information necessary to establish and document compliance with the California Green Building Standards Code.
 - b. Sustainable design submittals are in addition to other submittals.
 2. The following information shall be provided:
 - a. Paints and Coatings: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.

1.7 CLOSEOUT SUBMITTALS

- A. Warranty/Guarantee: Submit executed warranty and Subcontractor's guarantee.

1.8 QUALITY ASSURANCE

- A. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.
- B. Use materials and products of one manufacturer whenever possible.
- C. All materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.

1.9 DELIVERY, STORAGE AND HANDLING

- A. Deliver undamaged products to job in manufacturer's sealed containers and/or original bundles with tags and labels intact.
- B. Store materials in protected, dry conditions off of ground and in areas so as to not interfere with the progress of the work.
- C. Transport, store and handle in strict accord with the manufacturer's written recommendations.

1.10 FIELD CONDITIONS

- A. Make and be responsible for all field dimensions necessary for proper fitting and completion of work. Report discrepancies to Architect before proceeding.

1.11 WARRANTY

- A. Manufacturer: In addition to the Contractor's and Subcontractor's Guarantee, furnish Owner with manufacturer's fully executed written warranty for chain link fencing against defects in materials and workmanship, including the following:
 - 1. Windscreen: 3 years.

PART 2 - PRODUCTS

2.1 DESIGN AND PERFORMANCE CRITERIA

- A. Industry Standards: Materials and installation shall conform to the requirements of the Chain Link Fence Manufacturers Institute (CLFMI) "Product Manual."
- B. Regulatory Requirements: Pedestrian gates and related hardware shall comply with applicable codes, including provisions for accessibility required by CBC and the Americans with Disabilities Act "Designs for Accessible Design." Comply with the most stringent.
- C. Use new components **[,except existing fence indicated to be relocated,]** free from defects affecting service and appearance.
- D. Sizes specified or shown are minimum.

CHAIN LINK FENCES AND GATES

SECTION 32 3113

3595001

- E. Provide ferrous material except as otherwise indicated or specified.
- F. Sustainable Design:
 - 1. VOC emissions for field-applied paints and coatings must comply with limits specified in Section 01 6116.

2.2 WORKMANSHIP

- A. Galvanizing: Hot dip galvanize ferrous materials after fabrication. Repair zinc coating damaged in shop or during field erection by re-coating with hot repair compound, Re Galv, Galvalloy, Galveweld-alloy, or equal, applied in accord with manufacturer's recommendations.

2.3 MATERIALS

- A. Vinyl Coated Chain Link Fabric: Steel wire with no less than 1.20 ounce of zinc coating per square foot of surface area, covered with color coating of polyvinyl chloride no less than 15 mils thick fusion method with breaking strength of 1200 pounds (Class 2b), and complying with ASTM F668.
 - 1. Typical:
 - a. Wire Diameter: 9 gage, coated size.
 - b. Mesh Opening: 2 inches.
 - 2. Edges: Knuckle fabric at bottom and at top selvage.
 - 3. Fabric widths shall be one piece.
 - 4. Color of PVC Coating: In compliance with ASTM F934, black.
- B. Security Fabric: 16 gauge galvanized sheet metal in conformance with ASTM A653/A653M, 1.3 pounds per square foot, with round hole perforations; McNichols item number 1431141638 as specified and the basis of design, or equal.
 - 1. Perforations shall be 3/16" holes on a 1/4" stagger.
 - 2. Open Area: 51 percent.
 - 3. Finish: Prime and paint as specified in Section 09 9100, Painting, prior to installation.
- C. Security Fabric U-Edging: 14 gauge. galvanized hot rolled U shaped edging, 1 inch tall face x 3/8 inch opening width; McNichols quality U-Edging, item number 4003801410 as specified and the basis of design, or equal.
- D. Round Steel Pipe Fence Framework:
 - 1. Round steel pipe and rail, Schedule 40 standard weight pipe, in accordance with ASTM F1083, 1.8 oz/sq. ft (550 g/sq. m) hot dip galvanized zinc exterior and 1.8 oz/sq. ft (550 g/sq. m) hot dip galvanized zinc interior coating.
 - a. Regular Grade: Minimum steel yield strength 30,000 psi (205 MPa)
 - b. High Strength Grade: Minimum yield strength 50,000 psi (344 MPa)

- E. Line Posts:
 - 1. Without Slats or Windscreen: Regular Grade.
 - a. To 8'-0" High Maximum: 2-3/8 inch outside diameter pipe at 3.65 pounds per linear foot.
- F. End, Corner and Pull Posts: End, corner and pull posts shall also comply with gate post requirements, where occurs.
 - 1. Without Slats or Windscreen: Regular Strength.
 - a. To 8'-0" High Maximum: 2-7/8 inch outside diameter pipe at 5.79 pounds per linear foot.
- G. Gate Posts, Single Leaf: Gate posts shall also comply with End, Corner and Pull Post requirements.
 - 1. To 6 Feet Wide: 2-7/8 inch outside diameter pipe at 5.79 pounds per linear foot.
- H. Post caps: Cast or malleable iron ball or acorn shape; with opening for top rail.
- I. Top Rail, Bottom Rails, and Braces: 1-5/8" outside diameter pipe at 2.27 pounds per linear foot., or 1-5/8 inch x 1-1/4 inch roll formed section, 14 gauge.
 - 1. Brace Assembly:
 - a. Equally spaced between top rail and bottom fabric selvage and run from end, gate, or corner post to first line posts with suitable malleable iron fittings.
 - b. Truss from line post to end, gate, or corner post with 3/8 inch round rod.
- J. Coating for Fencing Components, Including Posts: Polyester powder coating, 3 to 4 mils thick, applied by the electrostatic spray process and baked at 450-500 degrees until cured; with 55 to 70 gloss.
 - 1. Color: Black.
- K. Bands: 14 gauge x 1 inch wide steel spaced 15 inches on center. for securing stretcher bars to end and gate posts.
 - 1. Bands may be used in conjunction with special fitting for securing rails to end and gate posts.
 - 2. Chamfer to ease projecting edges of bands.

2.4 GATES

- A. Frames:
 - 1. Gate Leaves to 6 Feet Wide: 1-5/8 inch outside diameter pipe at 2.27 pounds per linear foot.
 - 2. Gate Leaves Over 6 Feet Wide: 2 inch outside diameter pipe at 2.72 pounds per linear foot.

CHAIN LINK FENCES AND GATES

SECTION 32 3113

3595001

3. Provide additional horizontal and vertical pipe or tube as necessary to assure proper gate operation and attachment of fabric and hardware.
- B. Diagonal Bracing: Provide adjustable length 3/8 inch truss rods on non-welded gate frames and welded gate frames where corner rigidity is insufficient to insure no sag.
- C. Fabric: As specified for fence.
- D. Gate Assembly:
 1. Weld or assemble gate frame with malleable or pressed steel fittings and rivets to provide rigid connections.
 2. Install fabric with stretcher bars at vertical edges, which may also be used at top and bottom edges.
 3. Securely attach stretcher bars and fabric to frame on all sides at 15 inches on center.
 4. Attach hardware with rivets or by other means which will provide security against removal.
- E. Gate Hardware:
 1. General: Hardware at disabled accessible gates shall meet accessibility, including mounting, of the ADA and CBC. Comply with the most stringent.
 2. Hinges: Malleable iron, pressed or forged steel, non-liftoff type, easy noiseless operation and long wear, offset to permit 180 degree gate opening.
 - a. Provide 1-1/2 pair hinges for each leaf over 6 feet nominal height.
 - b. Ball and socket hinges not acceptable.
 3. Fork Latch: Malleable iron, drop fork latch which permits operation of the gate from either side, with padlock eye provided as integral part of latch.
 4. Panic / Lever Hardware: At gates to receive panic hardware or lever locksets, provide galvanized iron lockset boxes, backing plates or mounting plates as required for permanent, vandal resistant mounting.
 5. Kick Plates: 10 inches tall x width of gate x 14 gauge minimum, smooth uninterrupted surfaced, galvanized steel.
 - a. Mount on the bottom edge of gate at the push side. Mount on both sides at two-way swing gates.
 - b. Bottom edge of plate shall be not more than 3 inches above the top of the walk.
 - c. Plate shall be welded to the fence frame and shall allow the gate to be opened by a wheelchair footrest without creating a trap or hazardous condition.
 - d. Provide at pedestrian gates that are within the disabled accessible path of travel
 6. Gate Stop and Holder: Malleable iron.
 - a. Stop shall automatically engages gate frame and holds it in open position.
 - b. Provide at vehicle gates.

7. Double Gates: Provide cane bolt and ground set keeper with locking device and padlock eyes designed as integral part of latch, requiring one padlock for locking both leaves.

2.5 ADDITIONAL MATERIALS AND COMPONENTS

- A. Galvanizing Repair: Zinc coating damaged in shop or during field erection shall be by re-coated using a hot repair compound; "Regalv" repair stick by Rotometals, San Leandro, CA, or equal, applied in accordance with manufacturer's recommendations.
- B. Concrete:
 1. Materials:
 - a. Portland cement, ASTM C 150.
 - b. Aggregate: ASTM C33.
 - c. Water: Potable and free from substances harmful to concrete.
 2. Mix materials to obtain low slump concrete with 28 day compressive strength of 2,500 psi.
 - a. Maximum Size Aggregate: 1-1/2 inch.
 - b. Re-tempering not permitted.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. General:
 1. Execute work in accord with best trade practice for industrial fence installations.
 2. Make welds neat and secure, grind off excess exposed metal.
 3. Securely set posts plumb in alignment at proper depth and height, and rigid bracing where needed; install fabric under tension and securely tie to posts, rails and braces.
 4. Gates shall move freely without sag.
- B. Setting Posts:
 1. General: Space posts as indicated but not more than 10 feet on center.
 2. Pour and tamp concrete leaving no voids.
 - a. Check posts for vertical and top alignment and hold in position.
 - b. Dome top of concrete and trowel smooth to shed water away from post.
 - c. Align posts in footings as follows:
 3. Without Slats or Windscreen: Footings for End, corner and pull posts shall also comply with gate post requirements, where occurs.
 - a. Line Posts to 8'-0" High Maximum: 1'-0" diameter, 3'-3" minimum embedment.

CHAIN LINK FENCES AND GATES

SECTION 32 3113

3595001

- b. End, Corner and Pull Posts to 8'-0" High Maximum: 1'-0" diameter, 4'-3" minimum embedment.
- 4. Single Leaf Gates: Footings for gate posts shall also comply with End, Corner and Pull Post requirements.
 - a. To 6 Feet Wide: 12 inch diameter, 36 inch embedment.
- C. Where posts occur adjacent to structures or other work where concrete foundations may conflict with post footing, block out to allow post installation or use off-set post. Hold post 4 inches clear from face of structure.
- D. Fabric: Leave about 1-1/2 inches between ground and bottom barbs.
 - 1. Pull fabric taut and tie to posts, rails **[and tension wires]**.
 - 2. Install fabric on security side of fence.
 - 3. Fabric shall remain under tension after pulling force is released.
- E. Gates:
 - 1. Install gates plumb, level and secure, with full swing or slide without interference.
 - 2. Install ground set items in substantial concrete mass for adequate anchorage.
- F. Tie Wires:
 - 1. Install with one tight turn to hold fabric firmly to frame.
 - 2. Bend ends of wire inward to prevent hazard to persons or apparel.
- G. Fasteners:
 - 1. Install nuts for tension band and hardware bolts on side of fence opposite fabric side.
 - 2. Spoil ends of bolts to prevent removal of nuts.

3.2 ADJUSTING

- A. Repair exposed zinc coatings damaged in shop or during field erection using specified repair system and in compliance with ASTM A 780,
- B. Adjust gated hardware for smooth operation and lubricate where necessary.

END OF SECTION

*p:\sacramento\3595 tracy unified school district\001-000_villalovoz es new shade structures\08 specifications\06 spec\04 final\bohn\32 3113_chain link fences and gates.docx
Last Updated: February 25, 2022*

PART 1 - GENERAL

1.1 SUMMARY

A. Scope of Work:

1. Furnish all labor, materials, tools, equipment, and transportation required to perform and complete the installation of an automatic sprinkler irrigation system, including all piping, sprinkler heads, controls, connections, testing, etc. as shown on the Drawings and as specified herein. The water source for this project is potable water.
2. Utilize and accept as standards manufacturer's recommendations and/or installation details for any information not specifically detailed on the Drawings.

1.2 RELATED REQUIREMENTS

- A. Section 01 6116, Volatile Organic Compound (VOC) Restrictions, for VOC limits pertaining to adhesives, sealants, fillers, primers, and coatings.
- B. Section 01 8113, Sustainable Design Requirements, for CAL-Green general requirements and procedures.
- C. Section 31 0000, Earthwork.
- D. Section 31 2333, Trenching and Backfilling.
- E. Section 32 9000, Landscaping.

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CALGreen), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).

1.4 ADMINISTRATIVE REQUIREMENTS

A. Submittal Procedures:

1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
3. Sustainable Design Submittals shall comply with the additional requirements of Section 01 8113, Sustainable Design Requirements

**IRRIGATION
SECTION 32 8000
3595001**

B. Pre-Installation Meeting:

1. Request and hold a pre-installation meeting prior to beginning the work of this Section. Parties required to be in attendance are the Landscape Contractor, Project Inspector, Owner's Representative, and the Landscape Architect.

1.5 ACTION SUBMITTALS

- A. Product names are used as standards; provide proof as to equality of any proposed material and do not use other materials or methods unless approved in writing by the Owner's Representative. Submit no more than one request for substitution for each item. The decision of the Owner's Representative is final.
- B. Use equipment capacities specified herein as the minimum acceptable standards.
- C. List materials in the order in which they appear in Specifications; include substitutions. Submit the list for approval by the Owner's Representative.
- D. Make any mechanical, electrical, or other changes required for installation of any approved, substituted equipment to satisfaction of Owner's Representative and without additional cost to Owner. Approval by Owner's Representative of substituted equipment and/or dimensional drawing does not waive these requirements.
- E. Do not construe approval of material as authorization for any deviations from Specifications unless attention of Owner's Representative has been directed to specified deviations.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data for the following:
 1. For landscape contractor.
- B. Sample of manufacturers' warranty.
- C. Record of Pre-Installation Meeting.
- D. Sustainable Design:
 1. General:
 - a. Submit information necessary to establish and document compliance with the California Green Building Standards Code.
 - b. Sustainable design submittals are in addition to other submittals.
 2. The following information shall be provided:
 - a. Adhesives and Sealants: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.
 - b. Paints and Coatings: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.

1.7 CLOSEOUT SUBMITTALS

- A. Warranty/Guarantee: Submit executed warranty and subcontractor's guarantee.
- B. Maintenance and Operating Instructions:
 - 1. Furnish operating maintenance instructions bound in a hardback binder and indexed. Start compiling data upon approval of list of materials. Do not request final inspection until booklets are approved by Owner's Representative.
 - 2. Incorporate the following information in these sets:
 - a. Complete operating instructions for each item of irrigation equipment.
 - b. Typewritten maintenance instructions for each item of irrigation equipment.
 - c. Manufacturer's bulletins which explain installation, service, replacement parts, and maintenance.
 - d. Service telephone numbers and/or addresses posted in an appropriate place as designated by Owner's Representative.
- C. Record Drawings.

1.8 QUALITY ASSURANCE

- A. Qualifications: Work must be complete by a licensed Landscape Contractor. Provide proof of five years' continuous experience in landscaping and irrigation of projects of similar size.
- B. Certification: Ensure that the contractor installing the Central Control System is trained and certified in the installation of the Central Control System. The training and certification must have been completed within two years prior to the installation date.
- C. Work Force: Ensure that an experienced foreman is present at all times during installation. Keep the same foreman and workers on the job from commencement to completion.
- D. Reviews: Specifically request reviews of all items listed in Article INSPECTION REQUIREMENTS, prior to progressing to the next level of work.
- E. Standards:
 - 1. Provide work and material in full accordance with the rules and regulations of the National Electric Code; the Uniform Plumbing Code; and other applicable state or local laws or regulations.
 - 2. Furnish, without extra charge, additional material and labor required to comply with these rules and regulations, though the work may not be specifically indicated in the Specifications or Drawings.
 - 3. Where the Specification requirements exceed those of the above-mentioned codes and regulations, comply with the requirements in the Specifications.

1.9 DELIVERY, STORAGE AND HANDLING

- A. Transport, store and handle in strict conformance with the manufacturer's written recommendations.
- B. Deliver undamaged products to job in manufacturer's sealed containers and/or original bundles, with tags and labels intact. All material containers or certificates shall be clearly marked by manufacturer as to contents for inspection.
- C. Store materials in original undamaged packages and containers, inside well-ventilated area protected from weather, moisture, soilage, extreme temperatures, and humidity. Lay flat, blocked off ground.
- D. Use all means necessary to protect irrigation system materials before, during, and after installation and to protect related work and material.
- E. Handle plastic pipe carefully, especially protecting it from prolonged exposure to sunlight. Store pipe on beds that are the full length of the pipe, and keep pipe flat.

1.10 FIELD CONDITIONS

- A. Information on Drawings relative to existing conditions is approximate. During progress of construction, make deviations necessary to conform to actual conditions, as approved by Owner's Representative, without additional cost to Owner. Accept responsibility for any damage caused to existing services. Promptly notify Owner's Representative if services are found which are not shown on Drawings.
- B. Protect existing trees-to-remain as specified in "Existing Tree Protection" in Article PREPARATION, in Part 3 of this Section.
- C. Protect existing utilities within construction area. Repair damages to utility lines that occur as a result of operations of this work.
- D. Verify dimensions at building site and check existing conditions before beginning work. Make changes necessary to install work in harmony with other crafts after receiving approval by Owner's Representative.

1.11 INSPECTION REQUIREMENTS

- A. Obtain verification from Project Inspector for the following at the appropriate times during construction and prior to further progression of work in this Section:
 - 1. Pressure testing of all mainlines and lateral lines (See "Hydrostatic Tests – Open Trench" in Article FIELD QUALITY CONTROL, in Part 3 of this Section),
 - 2. Trench depth,
 - 3. Sleeves under pavement,
 - 4. Flushing of all mainlines and lateral lines,
 - 5. Backfill and pipe bedding,

- 6. Layout of heads,
 - 7. Operation of system and coverage adjustments (with Landscape Architect) after system is fully automated and operational, backfill of trenching is completed, and surface has been restored to original grades.
- B. In case of failure to obtain any verification by the Project Inspector as required above, remove and replace work as necessary to obtain the verification at no additional cost to the Owner.

1.12 WARRANTY AND GUARANTEE

- A. Manufacturer: In addition to the Contractor's and Subcontractor's Guarantee, furnish Owner with manufacturer's available fully executed written warranty against defects in materials and workmanship.
- B. Subcontractor Guarantee: Shall include damage by leaks and settlement of irrigation trenches.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Use materials as specified; any deviation from the Specifications must first be approved by the Owner's Representative in writing.

2.2 DESIGN AND PERFORMANCE CRITERIA

- A. Sustainable Design:
 - 1. VOC emissions for field-applied adhesives, sealants, and sealant primers must comply with limits specified in Section 01 6116.
 - 2. VOC emissions for field-applied paints and coatings must comply with limits specified in Section 01 6116.

2.3 MATERIALS

- A. Automatic Control Valves: As indicated on Drawings.
- B. Gate Valve: As indicated on Drawings.
- C. Pipe and Fittings:
 - 1. PVC pipe: As indicated on Drawings.
 - 2. PVC fittings three-inch (3") size and smaller: High impact, standard weight, Schedule 40, molded PVC as manufactured by George Fischer, Lasco, Spears, or approved equal.

IRRIGATION
SECTION 32 8000
3595001

3. All plastic pipe and fittings: Continuously and permanently marked with manufacturer's name, type of material, IPS size, schedule, NSF approval, and code number.
 4. Threaded PVC pipe and nipples: IPS Schedule 80 when necessary to use threaded connections to gauges, valves, or control valves. Threaded adapters may be used in place of nipples when making pipe to valve connections.
 5. Use 45-degree fittings for changes in depth of pipe, and at transition from main line to automatic control valves.
 6. Piping above ground: Schedule 40 galvanized steel with cast-iron fittings.
- D. PVC Primer: Weld-On P-70 Purple Primer or approved equal.
- E. PVC Glue: Weld-On 711 Gray heavy bodied PVC Cement or approved equal.
- F. PVC Glue for connections to Flexible PVC: Weld-On 795 Blue Flex PVC Cement or approved equal.
- G. Sleeves: As indicated on Drawings.
- H. All Valve Boxes and Covers: Manufactured, green with "Irrigation – Non-Potable" permanently embossed on cover. Carson, Rainbird or approved equal.
- I. Automatic Sprinkler Control Wire:
1. Connections between remote control valves and controller: UF-14 direct burial polyethylene (PE) insulated wire, Paige Electric P7079D or approved equal. Common wire to be white, and lead wire to be colored. If multiple controllers are used, a different color is to be used for each controller's lead wire. (Use red for the first controller). Spare wires are to be yellow.
 2. UL Listed waterproof sealing pack for wire connections: 3M DBR/Y-6, or approved equal.
 3. Provide adequate working space around electrical equipment in compliance with local codes and ordinances.
 4. Electrical, other than low voltage, such as power wiring, conduit, fuses, thermal overloads and disconnect switches, is included under Division 26 of these Specifications.
- J. Unions And Flanges:
1. Steel unions and flanges two inches (2") and smaller: 150 lb. screwed black (brass to iron seat) or galvanized malleable iron (ground joint).
 2. Steel unions and flanges two and one-half inches (2 ½") and larger: 150 lb. black flange union, flat-faced, full gasket.
 3. Gaskets: One-sixteenth inch (1/16") thick rubber Garlock No. 122, Johns-Manville or approved equal.

- 4. Flange Bolts: Open-hearth bolt steel, square heads with cold pressed hexagonal nuts, cadmium plated in ground. Provide copper-plated steel bolts and nuts or brass bolts and nuts for brass flanges.
- K. Sand for Trench Backfill: Natural sand, free of roots, bark, sticks, rags, or other extraneous material

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Prior to commencement of the work of this Section, obtain written verification from the project Civil Engineer that the rough grade in landscape areas is in conformance with Section 31 0000 - Earthwork.
- B. Examine conditions of work in place before beginning work; report defects.

3.2 PREPARATION

- A. Scheduling: Notify the Project Inspector prior to commencing and/or continuing the work of this Section. Remove and replace, at no cost to Owner, any work required as a result of failure to give the appropriate notification.
- B. Measurements: Take field measurements; report variance between plan and field dimensions.
- C. Protection: Maintain warning signs, shoring and barricades as required. Prevent injury to, or defacement of, existing improvements. At no additional cost to Owner, repair or replace items damaged by installation operations.
- D. Surface Preparation: Prior to beginning sprinkler irrigation work, complete placement of topsoil as specified in Section 31 0000 – Earthwork. Notify Project Inspector of irregularities if any.

3.3 AUTOMATIC CONTROLLER

- A. Connect automatic control valves to controller(s) in sequence as shown on Drawings.
- B. Install all exposed wires to a minimum of twenty-four inches (24") beyond controller within a UL approved rigid conduit.

3.4 GRADING

- A. Install all irrigation features to their finished grade and at depths indicated. Complete and /or accommodate all rough grading and/or finish grading before commencing with trenching.

**IRRIGATION
SECTION 32 8000
3595001**

3.5 LAYOUT

- A. Lay out work as accurately as possible to Drawings. Drawings are generally diagrammatic to extent that swing joint offsets and fittings are not shown. Record all changes on the Record Drawings.
- B. Do not willfully install the irrigation system as shown on Drawings when it is obvious, in the field, that obstructions or other discrepancies exist which may not have been considered in the design. Notify Owner's Representative of discrepancies before proceeding.

3.6 EXCAVATING AND TRENCHING

- A. General: Perform excavations as required for installation of work included under this Section, including shoring of earth banks to prevent cave-ins. Restore surfaces, existing underground installations, etc., damaged or cut as result of this work to their original condition and in a manner approved by the Landscape Architect.
- B. Width:
 - 1. Make trenches wide enough to allow a minimum of six inches (6") between parallel pipelines and three inches (3") between side of pipe and side of trench. Do not allow stacking of pipe within trench.
 - 2. Allow a minimum clearance of twelve inches (12") in any direction from parallel pipes of other trades.
- C. Preparation of Excavations: Remove rubbish and rocks from trenches. Bed pipe on a minimum of three inches (3") of clean, rock-free soil to provide a firm, uniform bearing for entire length of pipeline. If clean, rock-free soil is not available, use sand for pipe bedding. See Backfill and Compacting for the remainder of the trench backfill.
- D. Minimum depth of cover: Unless shown otherwise, provide the following minimums:
 - 1. Mainline: twenty-four inches (24") cover.
 - 2. Lateral line: twelve inches (12") cover.
- E. Conflicts with other trades:
 - 1. Hand-excavate trenches where potential conflict with other underground utilities exist.
 - 2. Where other utilities interfere with irrigation trenching and piping work, adjust the trench depth as instructed by Owner's Representative.

3.7 BACKFILL AND COMPACTING

- A. General: Do not begin until hydrostatic tests are completed and when system is operating and after required tests and inspections have been made.

- B. Backfill directly around the pipe: Cover pipe with a minimum of three inches (3") of clean, rock-free soil. If clean, rock-free soil is not available, use sand for three inches (3") of backfill above the pipe. The remainder of the trench backfill material can be native soil or material described below. Do not allow wedging or blocking of pipe.
- C. For backfill of trenches under paving areas:
 - 1. See Section 31 0000 – Earthwork for compaction rates and material
 - 2. See Section 31 2333 – Trenching and Backfilling for trench backfill procedure.
- D. For backfill of trenches in landscape areas:
 - 1. Place backfill in six-inch (6") layers and compact with an acceptable mechanical compactor.
 - 2. Compact backfill material in landscape areas to eighty-five percent (85%) maximum dry density of the soil.
 - 3. If settlement occurs along trenches, make adjustments in pipes, valves, and sprinkler heads, soil, sod or paving as necessary to bring the system, soil, sod or paving to the proper level or the permanent grade, without additional cost to the Owner.
- E. Excess Soil: Remove all rocks, debris, and excess soil that results from sprinkler irrigation trenching operations, landscape planting, and soil preparation operations off site at no additional cost to the Owner. If soil meets topsoil requirements in Section 31 0000 – Earthwork, it may be used for finish grading.
- F. Finishing: Dress-off areas to eliminate construction scars.

3.8 CONTROL WIRES

- A. General: Install control wires beneath sprinkler main line whenever possible; tape wires to mainline pipe. Provide one spare wire for each controller.
- B. Slack Wire: Provide eighteen inches (18") of slack wire for each wire connected to automatic control valve. Slack wire shall be coiled and left in the valve box. Tape wires in bundles every ten feet (10'); do not tape wires in sleeves.
- C. Expansion and Contraction: Snake wire in trench to allow for contraction of wire.
- D. Wire Passing Under Existing or Future Paving or Construction: Encase in PVC Schedule 40 or galvanized steel conduit extending at least twelve inches (12") beyond edges of paving or construction.
- E. Wire Connections: Install wire connections in a waterproof sealing pack.

**IRRIGATION
SECTION 32 8000
3595001**

- F. Wire Splicing: Permit splicing only on runs exceeding 500 feet. Locate all splices within valve boxes.
- G. Wire Termination: Install wire in a valve box with eighteen inches (18") of slack wire coiled and individually capped with approved waterproof sealing pack.
- H. Spare Wire: Install two (2) spare wires along each wire path. If there is more than one wire path from the controller, the contractor to install two (2) spare wires per path. Provide eighteen inches (18") of slack wire at each automatic control valve.

3.9 FLUSHING LINES

- A. Thoroughly flush lines prior to installing valves, performing hydrostatic testing, or installing sprinklers. Divert water to prevent washouts.

3.10 AUTOMATIC CONTROL VALVES

- A. Install where shown and where practical; place no closer than twelve inches (12") to walk edges, building walls, or fences. Refer to detail for example.
- B. Thoroughly flush mainline before installing valve.
- C. Install valves in ground cover areas where possible.

3.11 PIPING

- A. General: Install in conformance with reference standards, manufacturer's written directions, as shown on Drawings and as herein specified.
- B. Workmanship:
 - 1. General: Install sprinkler irrigation equipment in planted areas throughout the site.
 - 2. Coordination: Organize location of sleeves with other trades as required.
- C. Pipe Line Assembly:
 - 1. General:
 - a. Cutting: Cut pipe square; remove rough edges or burrs.
 - b. Solvent-welded Connections: Use materials and methods recommended by the pipe manufacturer.
 - c. Brushes: Use non-synthetic brushes to apply solvents and primer.
 - d. Cleaning: Clean pipe and fittings of dirt, moisture, and debris prior to applying solvent or primer.
 - e. Assembly: Allow pipe to be assembled and welded on the surface or in the trench.
 - f. Expansion and Contraction: Snake pipe from side to side of trench to allow for expansion and contraction.

- g. Location: Locate pipes as shown on Drawings except where existing supply valves, utilities or obstructions prohibit or where slight changes are approved to better suit field conditions.
- 2. Connections:
 - a. Threaded Plastic Pipe Connection:
 - 1) Use Teflon tape or pipe joint compound.
 - 2) When assembling to threaded pipe, take up joint no more than one full turn beyond hand-tight.
 - b. Where assembling soft metal (brass or copper) or plastic pipe, use strap-type friction wrench only; do not use a metal-jawed wrench.
 - c. Threading:
 - 1) Do not permit the use of field-threading of plastic pipe or fittings. Use only factory-formed threads.
 - 2) Use factory-made nipples wherever possible. Permit the use of field-cut threads in metallic pipe only where absolutely necessary. When field-threading, cut threads accurately on axis with sharp dies.
 - 3) Use pipe joint compound for all threaded joints. Apply compound to male thread only.
- 3. Sleeves and conduits:
 - a. Use sleeves of adequate size to accommodate retrieval for repair of wiring or piping and extend a minimum of twelve inches (12") beyond edges of walls or paving.
 - b. Provide removable, non-decaying plug at end of sleeve to prevent entrance of soil.
- 4. Unions: Locate unions for easy removal of equipment or valve.
- 5. Capping: Plug or seal opening as lines are installed to prevent entrance materials that would obstruct pipe. Leave in place until removal is necessary for completion of installation.

3.12 FIELD QUALITY CONTROL

- A. Visual Inspection: Verify that all pipe is homogenous throughout and free from visual cracks, holes, or foreign materials. Inspect each length of pipe. All materials are subject to impact test at the discretion of the Landscape Architect.
- B. Hydrostatic Tests – Open Trench:
 - 1. Center-load piping with a small amount of backfill to prevent arching or slipping under pressure.
 - 2. Request the presence of the Project Inspector in writing at least forty-eight hours in advance of testing.
 - 3. At no additional cost to Owner, test in the presence of the Project Inspector.

IRRIGATION
SECTION 32 8000
3595001

4. Apply continuous static water pressure of 100 psi when welded plastic joints have cured at least twenty-four hours, and with the risers capped, as follows: test main lines and submains for four hours; test lateral lines for two hours.
 5. Repair leaks resulting from tests; and repeat tests.
 6. Test to determine that all sprinkler heads function according to manufacturer's data and give full coverage according to intent of Drawings. Replace any sprinklers not functioning as specified with ones that do, or otherwise correct system to provide satisfactory performance.
- C. Continuity Testing: Test locating device and control wires for continuity prior to and after back-filling operations.

3.13 CLEAN-UP

- A. Remove debris resulting from work of this Section.

3.14 ADJUSTMENTS AND MAINTENANCE

- A. Adjusting System: Prior to acceptance, satisfactorily adjust and regulate entire system. Set watering schedule on controller appropriate to types of plants and season of year. Adjust remote control valves to operate sprinkler heads at optimum performance based on pressure and simultaneous demands through supply lines.
- B. System Layout: Provide reduced prints of Record Document irrigation plans, laminated in four (4) mil. plastic, of size to fit controller door. Enlarge remote-control valve designations as necessary for legibility. Color-code areas covered by each station. Affix plans to inside of controller door.
- C. Instructions: Upon completion of work, instruct maintenance personnel on operation and maintenance procedures for entire system.
- D. Flow Charts: Record and prepare an accurate flow-rate chart for each automatic control valve.

3.15 RECORD DRAWINGS

- A. As specified in Section 01 3300, Submittal Procedures, and the following:
1. Regularly update plans of the system and any changes made to the system throughout the project. Record all changes on this plan before trenches are back-filled.
 2. Record complete as-built information and submit the Record Drawings to the Architect before applying for payment for work installed.

3. Show the following on the Record Drawings accurately to scale and dimensioned from two permanent points of reference:
 - a. and spares Distance of mainline from nearby hardscape.
 - b. Location of automatic control valves, quick couplers, and gate valves.
 - c. Location and size of all sleeves.
 - d. Location of automatic control wires.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Soil Preparation and Fertilization
 - 2. Planting
 - 3. Weed Control
 - 4. Mulch
 - 5. Clean-up
 - 6. Landscape Maintenance Period
- B. Work not included in this Section: Landscape elements such as concrete walks, fencing, outdoor lighting, rough grading, and clearing are not a part of this Section unless shown on the landscape Drawings.

1.2 RELATED REQUIREMENTS

- A. Section 01 8113, Sustainable Design Requirements, for CAL-Green **[and Collaborative for High Performance Schools (CHPS)]** general requirements and procedures.
- B. Section 31 0000, Earthwork.
- C. Section 32 8000, Irrigation

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CALGreen), edition as noted on the drawings, as adopted by the California Division of the State Architect (DSA).
- C. EPA - Federal Insecticide, Fungicide and Rodenticide Act.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Submittal Procedures:
 - 1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
 - 2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.

**LANDSCAPING
SECTION 32 9000
3595001**

- B. Pre-Installation Meeting: Request and hold a pre-installation meeting prior to beginning the work of this Section. Parties required to be in attendance are the Landscape Contractor, Project Inspector, Owner's Representative, and Landscape Architect.
- C. Pre-scheduled On-site Project Meetings: Hold regularly-scheduled (monthly or bimonthly as determined by the Landscape Architect) on-site project meetings with the Landscape Architect, Project Inspector and Owner's Representative. Dates and times will be jointly agreed upon.

1.5 ACTION SUBMITTALS

- A. Plant Material: Within fifteen (15) days after award of contract, locate plant materials required for construction. Ensure that trees and shrubs are contract- grown from a certified nursery. Notify Owner's Representative of plant material "tied off" for review at selected nursery. If specified material is not obtainable, submit the following to Owner's Representative: proof of non-availability, proposal for use of equivalent material, photographs of alternative choices of plant material. Include clear, written description of type, size, condition, and general character of plant material.
- B. Data Sheets:
 - 1. Provide product data for each type of landscape material indicated in the Drawings and Specifications.
 - 2. Letter from the manufacturer stating that the soil amendment material submitted for use on this project has no metal fragments or foreign objects.
- C. Samples: Submit samples of the following materials to Landscape Architect for approval:
 - 1. Soil amendment: (3) one-quart zip-locked plastic bags.
 - 2. Bark Mulch: (3) one-quart zip-locked plastic bags.
 - 3. Imported Topsoil: (3) one-quart zip-locked plastic bags.
- D. Provide soils analysis reports prepared by a qualified soils laboratory in accordance with the Soils Testing Requirements under "Soil Testing" in Article SOIL TESTING, in Part 3 of this section.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For landscape contractor.
- B. Prior to planting, submit copies of all trucking or packaging tags for all soil amendment, fertilizer and other additives to Landscape Architect so the quantities can be verified.
- C. Record of Pre-Installation Meeting.

1.7 CLOSEOUT SUBMITTALS

- A. Guarantee: Submit Subcontractor's guarantee.
- B. Record Drawings.

1.8 QUALITY ASSURANCE

- A. Qualifications: Work must be completed by a licensed Landscape Contractor. Provide proof of five years of continuous experience in landscaping and irrigation of projects of similar size (+/- 20% of the construction cost) and scope for education campuses. Landscape Contractor to have a minimum of two projects either completed or in construction in the last five years.
- B. Work Force: Ensure that an experienced foreman is present at all times during installation. Keep the same foreman and workers on the job from commencement to completion.
- C. Reviews: Specifically request reviews of all items listed below in Article INSPECTION REQUIREMENTS prior to progressing to the next level of work. The Owner's Representative reserves the right to inspect and reject material, both at place of growth and at site, before and/or after planting, for compliance with requirements for name, variety, size and quality.
- D. Reference Standards: Meet or exceed Federal, State and County laws requiring inspection of all plants and planting materials for plant disease and insect control.
- E. Plant Material:
 - 1. Conform to the current edition of Horticultural Standards for quality of Number 1 grade nursery stock as adopted by the American Association of Nurserymen. Conform to sizes specified on plant legend. Select plants which have a natural shape and appearance.
 - 2. Select only plants that are true to name, and tag one of each bundle or lot with the name of the plant in accordance with the standards of practice of the American Association of Nurserymen. In all cases, botanical names shall take precedence over common names.
 - 3. Tag each plant of a patented variety with the variety and identification number, where applicable, as it is delivered to the job site.
 - 4. Select only plants which have been nursery-grown in accordance with good horticultural practices and which have been grown under climatic conditions similar to those in the locality of the project for at least one year.
 - 5. Select only plants which are typical of their species or variety; have normal habits of growth; are sound, healthy, vigorous, well-branched and densely-foliated when in leaf; are free of disease, insect pests, eggs or larvae; and have a healthy and well-developed root system.

LANDSCAPING
SECTION 32 9000
3595001

6. Select only container stock that has been grown in the containers in which delivered for at least six (6) months, but not over two (2) years. Provide samples to show that there are no root-bound conditions.
7. Do not use plants that are severely pruned or headed-back to meet size requirements.
8. Do not plant container-grown plants that have cracked or broken balls of earth when taken from the container. Remove canned stock carefully from cans after containers have been cut on two sides with tin snips or other approved cutter.
9. At any time prior to final acceptance, be prepared to replace any plants that are rejected by the Owner's Representative because of physical damage to the plant.
10. Do not remove container-grown stock from containers before time of planting.
11. Stake shrubs with one-inch by one-inch by eighteen-inch (1"x1"x18") stakes in such manner that the stakes are not visible, and tie to upright position if they lean and/or are not growing in a vertical position.
12. Furnish quantities necessary to complete the work as shown on the Drawings and, if necessary, make up for any discrepancies in the quantities given in the Plant List at no additional cost to Owner.

1.9 DELIVERY, STORAGE AND HANDLING

- A. Packaged Materials: Deliver packaged materials in original, unopened containers showing weight, certified analysis, name and address of manufacturer, and indication of conformance with state and federal laws if applicable.
- B. Coordinate a time for the Landscape Architect to inspect the plants upon their delivery to the project site.
- C. Bulk Materials:
 1. Do not dump or store bulk materials near structures, utilities, walkways or pavements, or on existing turf areas or plants.
 2. Provide erosion-control measures to prevent erosion or displacement of bulk materials, discharge of soil-bearing water runoff, and airborne dust reaching adjacent properties, water conveyance systems, or walkways.
 3. Accompany each delivery of bulk fertilizers and soil amendments with appropriate certificates.

1.10 FIELD CONDITIONS

- A. Planting Season Limits: Do not plant when grounds are wet or temperature is below 25° F. Do not proceed with any soil preparation and fertilization if all planting cannot be completed within Planting Season Limit.

1.11 INSPECTION REQUIREMENTS

- A. Landscape Architect reserves the right to examine and reject plant material both at place of growth and at site, before and after planting, for compliance with requirements of name, variety, size, and quality.
- B. Obtain verification from Project Inspector for the following at the appropriate times during construction and prior to further progression of work in this Section:
 - 1. Rough grading is to tolerances specified in Section 31 0000 – Earthwork.
 - 2. The placement of landscape backfill material is as specified in this Section.
 - 3. Prior to the commencement of planting operations specified in this Section, the coverage and operation of the sprinkler irrigation system are as specified in Section 32 8000 - IRRIGATION.
 - 4. Required Test: For each load of soil amendment delivered to the site, spread at least two cubic yards (2 cy) of material onto a paved surface approximately two inches (2") deep. Pass a magnetic rake over the material in two directions. If any metal is found, test the entire load in the same manner. Perform all testing in the presence of the Project Inspector.
 - 5. Soil amendments, fertilizer, and bark mulch have been delivered to the site by the supplier, the invoices from the supplier indicate the project name and quantities delivered, and the Project Inspector has received copies of all such documents.
 - 6. Prior to planting, amendments and conditioners have been incorporated as per pre-planting recommendations, and planting areas have been made ready to receive planting.
- C. In case of failure to obtain any verification by the Project Inspector as required above, remove and replace work as necessary to obtain the verification at no additional cost to the Owner.

1.12 PROTECTION

- A. Provide protection for persons and property throughout progress of work. Use temporary barricades as required. Proceed with work in such manner as to minimize spread of dust and flying particles and to provide safe working conditions for personnel. Store materials and equipment where directed.
- B. Existing Construction: Execute work in an orderly and careful manner to protect paving, work of other trades, and other improvements.
- C. Existing Utilities: Provide protection for existing utilities within construction area. At no additional cost to Owner, repair any damages to utility lines that occur as a result of this work.

LANDSCAPING
SECTION 32 9000
3595001

- D. Landscaping: Protect landscape work and materials from damage due to landscape operations, operations by other contractors and trades, and trespassers. Maintain protection during installation and maintenance periods.

1.13 PLANTING SCHEDULE

- A. Install, establish, and maintain all lawn areas for a minimum of ninety (90) days prior to date of substantial completion. Coordinate schedule with other work and overall project schedule. Failure to install lawn areas by this date shall result in assessment of liquidated damages.
- B. Proceed with work in an orderly and timely manner to complete installation of landscaping within contract limits.

1.14 LANDSCAPE MAINTENANCE PERIOD REQUIREMENTS

- A. Beginning of Landscape Maintenance Period:
 - 1. General: Landscape Maintenance Period does not begin until all work is installed, as determined by Landscape Architect, in writing.
 - 2. On-site Inspection: When all work is complete, request and hold a meeting to include the Landscape Architect, Project Inspector, Architect and Owner's Representative who must together authorize and determine the start date for the landscape maintenance period. Coordinate and give notice of the date and time of the on-site meeting to all parties at least forty-eight (48) hours in advance.
 - 3. Acceptability: In cases where the landscape has not been accepted, and authorization has not been given to begin the maintenance period, proceed with weeding, spraying, etc., as necessary prior to the beginning of the maintenance period.
- B. Duration of Landscape Maintenance Period:
 - 1. The Landscape Maintenance Period shall continue for a minimum of ninety (90) calendar days. During this time, continuously maintain all areas involved until final acceptance of the work by the Owner's Representative. See Landscape Maintenance Period procedure in Article LANDSCAPE MAINTENANCE, in Part 3 of this Section.

1.15 GUARANTEE

- A. The guarantee period for lawn and plant material shall be the duration of the landscape maintenance period, from commencement until final acceptance of the work of this Section.

- B. During the guarantee period, repair and/or replace plants and lawn not in satisfactory growing condition, as determined by Owner's Representative, without additional cost to Owner. Plants are to be replaced in accordance with Article LANDSCAPE MAINTENANCE in Part 3 of this Section, using plants of the same kind and size specified in plant list.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Use material in new and perfect condition as specified. Any deviations or substitutions from the Specification and Drawings must first be approved by Owner's Representative in writing prior to use.

2.2 SOIL PREPARATION MATERIALS

- A. Topsoil: Fertile; friable; natural loam surface soil; reasonably free of subsoil, clay lumps, brush, weeds and other litter; and free of roots, stumps, stones/rocks, and other extraneous or toxic matter harmful to plant growth.
- B. Soil Amendment: One-percent nitrogen-impregnated bark product with a ninety-percent (90%) bark base and zero to one-quarter inch (0-1/4") particle size, or approved equivalent. Do not spread until testing requirements have been satisfied.
- C. Fertilizer/Soil Conditioner: Gro-Power Plus or approved equal.
- D. Fertilizer for Trees and Shrubs: Seven-gram Gro-Power Planting Tablets (12-8-8 NPK) or approved equal.
- E. Vitamin B-1: "Superthrive", "Liquinox Start", "Cal-Liquid", or approved equal.

2.3 MISCELLANEOUS LANDSCAPE MATERIALS

- A. Bark Mulch: Untreated, shredded cedar.
- B. Tree-staking System: As indicated on Drawings.
- C. Pre-Emergent Weed Control: Oxadiazon, "Treeflan", "Ronstar 2G", "Surflan" (Elano Products Company), or approved equal.

2.4 PLANT MATERIAL:

- A. Nursery Plant Stock:
 - 1. As indicated on Drawings. Do not remove container-grown stock from containers until planting time. Plants shall be true to name.

LANDSCAPING
SECTION 32 9000
3595001

2. Healthy, shapely, well-rooted, not pot-bound, free from insect pests or plant diseases and properly "hardened off" before planting. Replace plants that are not alive or are not in satisfactory growing condition, as determined by the Landscape Architect, without additional cost to Owner. The Landscape Architect may reject plants before and/or after planting.
3. Labeled. Label at least one tree and one shrub of each species with a securely-attached, waterproof tag bearing legible designation of botanical and common name.

PART 3 - EXECUTION

3.1 SITE CONDITIONS

- A. Examine the site, verify grade elevations, and observe conditions under which work is to be performed. Do not proceed with work until unsatisfactory conditions have been corrected in a manner acceptable to the Owner's Representative.
- B. Proceed with complete landscape work as rapidly as portions of the site become available, working within seasonal limitations for each kind of landscape work required.
- C. Determine location of underground utilities and perform work in a manner which will avoid possible damage. Hand-excavate, as required, to minimize possibility of damage to underground utilities. Maintain grade stakes set by others until removal is mutually agreed upon by parties concerned.
- D. When conditions detrimental to sod or plant growth are encountered, such as rubble fill, adverse drainage condition, or other obstructions, notify the Owner's Representative before planting.

3.2 SOIL TESTING

- A. Coordinate soil testing in an expeditious and timely manner as required for on-site topsoil materials. Contract with a soil laboratory and include cost of sampling and testing in contract price. Take one (1) sample for every 5,000 square feet of landscape area up to a maximum of six (6) samples under the direction of and in the presence of the Owner's Representative.
- B. Submit each sample, according to the quantity of soil required by testing laboratory, to a competent laboratory approved by the Owner's Representative.
- C. Provide analysis of soil samples for pH, salinity, ammonia, phosphate, potassium, calcium, magnesium, boron, and sodium levels. Provide appraisal of chemical properties, including particle size determination, and recommendations for types and quantities of amendments and fertilizers.

3.3 PREPARATION

A. Clearing of Vegetation:

1. If live perennial weeds exist on site at the beginning of work, spray with a non-selective systemic contact herbicide as recommended and applied by an approved licensed landscape pest control advisor and applicator. Leave sprayed plants intact for at least 15 days.
2. Clear and remove existing weeds by mowing or grubbing off all plant parts at least one-quarter inch ($\frac{1}{4}$ ") inch below surface of soil over entire areas to be planted.

B. Soil preparation:

1. Loosen soil in all planting areas, and on slopes flatter than 3:1 gradient, to a depth of six to eight inches (6" - 8") below finish grade. All debris, foreign matter, and stones shall be removed prior to the placing of any fertilizers or conditioners. Soil preparation is for all shrub planting beds, lawn hydroseeded areas and sodded lawn areas.
2. Conduct the required soil tests and instruct the lab to include a minimum of the following soil improvements in the recommendation on the soils report.
 - a. Soil Amendment: Two cubic yards (2 cy) per 1,000 square feet.
 - b. Gro-Power Plus: One hundred fifty pounds (150 lbs) per 1,000 square feet.
 - c. If the lab recommends less than six cubic yards (6 cy) of soil amendment, the excess bid amount shall be applied to the cost of any additional recommended soil improvements, or returned to the Owner as a credit
3. Apply amendments as follows, using rates recommended by the soils testing laboratory (the rates of amendments shown below are for bidding purposes only):
 - a. Fertilizer/Soil Conditioner: Broadcast 150 pounds of Gro Power Plus per 1,000 square feet in all planting areas and rototill to a depth of six to eight inches (6" - 8"). Remove from the site any rock and debris brought to the surface by cultivations. "Cultipack" all areas to receive sod or hydroseed.
 - b. Apply soil amendment to all planting areas at the rate of six cubic yards (6 cy) per 1,000 sf and rototill into the top six to eight inches (6" – 8").
4. Upon completion of finish grading, request an review and obtain approval of Landscape Architect prior to commencement of planting or hydroseeding.

C. Finish Grading for all Planting areas

1. Refer to Earthwork Specification Section for Rough Grading.
2. Grade to elevations and contours shown on Drawings. Fill low spots with landscape backfill material and grade to surface drain in manner indicated on Drawings.
3. Finish-grade so that the entire area within the contract lines has a natural and pleasing appearance as specified and as directed by Landscape Architect.

LANDSCAPING
SECTION 32 9000
3595001

D. Planting Pits for Trees:

1. Excavate pits with vertical sides and with bottom of excavation slightly raised at center to provide proper drainage.
2. Set container-grown stock in center of pit on earth pedestal. Separate roots and/or prune roots as directed by Landscape Architect. In hot weather, pre-wet pit. Loosen outside roots from sides and bottom of root ball. When set, place additional backfill around base and sides of root ball. Work each layer to settle backfill and eliminate voids and air pockets. Water after placing final layer of backfill.
3. Loosen hard subsoil in bottom of excavation. Extend excavation as required to insure proper drainage from plant pits.
4. Fill excavated planting pits with water to half the depth of pit. Pits should drain within four hours (4 hrs). If planting pits do not drain, notify Project Inspector immediately. Do not proceed with planting until Landscape Architect has resolved a method to provide drainage.

E. Planting Pits for Shrubs/Groundcover:

1. Excavate pits and trenches with vertical sides and with bottom of excavation slightly raised at center to provide proper drainage.
2. Loosen hard subsoil in bottom of excavation. Extend excavation as required to insure proper drainage from plant pits.
3. Fill excavated planting pits with water to half the depth of pit. Pits should drain within four hours (4 hrs). If planting pits do not drain, notify Project Inspector immediately. Do not proceed with planting until Landscape Architect has resolved a method to provide drainage.

3.4 PLANTING

A. Shrubs:

1. Lay out individual shrub locations and areas for multiple plantings. Stake the locations, outline the areas, and secure the Owner's Representative's acceptance before beginning the planting work. Make minor adjustments as requested.
2. Scarify root ball prior to planting. Plant in holes twice the diameter of the root ball and to a depth equal to the container's height. Place the shrub and/or groundcover so the top of the root ball is one inch (1") higher than the surrounding grade. Set container-grown stock in center of pit. In hot weather, pre-wet the pit. When set, place additional backfill around base and sides of root ball. Work each layer to settle backfill and eliminate voids and air pockets. Thoroughly compact lower half of backfill in plant pit. See staking or guying detail. Water after planting. Provide a berm or watering basin for each tree. Add Vitamin B-1, in the proper solution as recommended by the manufacturer, to the second watering of the basin.
3. Place fertilizer planting tablets in root zone and alongside each plant. Follow manufacturer's instructions for number of tablets to use for each container size.

4. See Drawings for additional information.
 5. Grooming and Staking of Trees:
 - a. Prune, thin-out and shape trees in accordance with standard horticultural practice. Prune trees to retain required height and spread. Unless otherwise directed by Landscape Architect, do not cut tree leaders, and remove only injured or dead branches from flowering trees.
 - b. Paint cuts over one-half inch ($\frac{1}{2}$ ") in size with standard tree paint or compound, covering exposed, living tissue. Use paint that is waterproof, antiseptic, adhesive, elastic and free of kerosene, coal tar, creosote, and other substances harmful to plants. Do not use shellac.
 - c. Stake or guy trees immediately after planting, as indicated on Drawings.
 6. Grooming of Shrubs:
 - a. Prune, thin-out and shape shrubs in accordance with standard horticultural practice. Prune shrubs to retain natural character and to accomplish their use in landscape design. The required plant size is its size after pruning.
 - b. Remove and replace excessively pruned or malformed new plants resulting from improper pruning.
- B. Request review by the Landscape Architect after locating, but prior to planting all trees. Under the direction of the Landscape Architect, make slight adjustments to plant material location as necessary to reflect original intention of Drawings.

3.5 WEED CONTROL

- A. Apply pre-emergent weed control to all planting areas (except lawn) after completion of all planting and one complete watering. Follow manufacturer's directions. To prevent washing away of weed control, do not over-water after its application. Do not allow any weed control into lawn areas. Treat any existing noxious weeds, such as Johnson grass, with Roundup in successive treatments until all roots are destroyed, then remove all grass and roots. Notify Owner's Representative of time of installation for verification of application.

3.6 BARK MULCH

- A. Apply mulch at the rate of three inches (3") deep to all planting areas, exclusive of lawn, after the planting and weed control are completed. Twelve inches (12") from planter edges, taper full depth of mulch to meet adjacent grades. Do not place mulch within three inches (3") of trunk or stems.

3.7 CLEAN-UP

- A. During construction, keep the site free of rubbish and debris, and clean up the site promptly when notified to do so. Take care to prevent spillage on streets from hauling and immediately clean up any such spillage and/or debris deposited on streets due to the work of this Section.

LANDSCAPING
SECTION 32 9000
3595001

- B. During all phases of the construction work, take all precautions to abate dust nuisance by clean-up, sweeping, sprinkling with water, or other means as necessary.
- C. Paving: Maintain cleanliness of paving areas and other public areas used by equipment, and immediately remove spillage; remove rubbish, debris, and other material resulting from landscaping work, leaving site in a safe and clean condition.

3.8 LANDSCAPE MAINTENANCE

- A. The Landscape Maintenance Period will begin when all the Landscape Maintenance Period Requirements have been met (See Part 1 of these Specifications).
- B. Cleaning: Maintain cleanliness on paving areas and other public areas used by equipment and immediately remove all spillage. Remove from project site all rubbish and debris found thereon and all material and debris resulting from landscaping work, leaving the site in a safe and clean condition.
- C. Maintenance:
 - 1. Sprinkler Irrigation System:
 - a. Check system weekly for proper operation. Flush lateral lines out after removing last sprinkler head or two at each end of lateral. Adjust all heads as necessary for unimpeded coverage.
 - b. Set and program automatic controllers for seasonal water requirements. Provide the Owner's Representative with keys to the controllers and instructions on how to turn off system in case of emergency.
 - c. Repair all damages to sprinkler irrigation system as part of the contract work. Make repairs within one watering period or one week, whichever is the least amount of time.
 - 2. Shrubs:
 - a. Water enough that moisture penetrates throughout root zone and only as frequently as necessary to maintain healthy growth.
 - b. Construct and/or remove water basins around each plant, depending on the time of the year and as directed.
 - c. Do not prune unless directed by the Landscape Architect.
 - d. Replace any dead, dying or vandalized plant material on a weekly basis throughout the Landscape Maintenance Period.
 - 3. Insecticide and Herbicide Application:
 - a. If needed, control weeds with selective herbicides and sprays. In areas where crabgrass has infested the lawn, apply pre-emergent herbicides such as Dacthal by Amvac, Balan, or Betasan by Gowan for control prior to crabgrass germination. Control insect pests if necessary.
 - b. Use only a licensed Pest Control Operator to apply herbicides and sprays and to maintain a log for applications indicating material, timing, and rate.

- D. Final Acceptance of the Landscape Maintenance Period: request on-site meeting forty-eight hours (48 hrs.) in advance with the Landscape Architect and Owner's Representative to determine the end of the Landscape Maintenance Period.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Domestic water piping system.
 - 2. Fire protection piping systems.
 - 3. Sewer piping system

1.2 RELATED REQUIREMENTS

- A. Section 01 5000, Temporary Facilities and Controls.
- B. Section 01 6116, Volatile Organic Compound (VOC) Restrictions, for VOC limits pertaining to adhesives, sealants, fillers, primers, and coatings.
- C. Section 01 8113, Sustainable Design Requirements, for CAL-Green [and Collaborative for High Performance Schools (CHPS)] general requirements and procedures.
- D. Section 31 0000, Earthwork.
- E. Section 31 2333, Trenching and Backfilling.
- F. Section 32 1600, Site Concrete.

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CAL Green), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- C. California Plumbing Code, (CPC), edition as noted on the Drawings.
- D. California State Health and Safety Code Section 116875, Lead Free Public Water Systems.
- E. Local Jurisdiction: Any work within the street, highway or right-of-way shall be performed in accordance with the requirement of the governmental agencies having jurisdiction, and shall not begin until all of those governing authorities have been notified.
- F. ASTM International (ASTM):
 - 1. D422-63: Test Method for Particle Size Analysis of Soil.
 - 2. D698-00: Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures, Using 5.5 lb (2.49 Kg) Rammer and 12 inch (304.8 mm) Drop.

3. D1556-00: Test Method for Density of Soil in Place by the Sand-Cone Method.
4. D1557-02: Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 10 lb. (4.54 Kg) Rammer and 18 inch (457 mm) Drop.
5. D3017-05: Test Methods for Moisture Content of Soils and Soil-Aggregate Mixture by Nuclear Methods (Shallow Depth).
6. D4318-05: Test Method for Liquid Limit, Plastic Limit, and Plasticity Limit.

G. CALTRANS Standard Specifications.

H. CAL-OSHA, Title 8, Section 1590 (e).

I. NFPA 13, 24 and 25, per CFC chapter 80 and CBC chapter 35.

1.4 ADMINISTRATIVE REQUIREMENTS

A. Submittal Procedures:

1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
3. Sustainable Design Submittals shall comply with the additional requirements of Section 01 8113, Sustainable Design Requirements.

1.5 ACTION SUBMITTALS

- A. Provide supplier's descriptive literature for all products to demonstrate compliance with specified attributes.
- B. Substitution: Provide all data of proposed material being submitted as a substitution. Provide comparison with specified product data and identify all differences. Failure to provide comparison will be reason for rejection.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For contractor / installer.
- B. Provide sieve analysis from accredited testing lab on pipe bedding material. Analysis shall have a current date not older than project contract signing date.
- C. Sustainable Design:
1. General:
 - a. Submit information necessary to establish and document compliance with the California Green Building Standards Code.
 - b. Sustainable design submittals are in addition to other submittals.
 2. The following information shall be provided:
 - a. Adhesives and Sealants: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.

- b. Paints and Coatings: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.

1.7 CLOSEOUT SUBMITTALS

- A. Guarantee: Submit subcontractor's guarantee.
- B. Water Sterilization Test Report.

1.8 QUALITY ASSURANCE

- A. Contractor / Installer shall have been in business for five (5) years providing/finishing similar size projects and complexity.
- B. Contractor shall be solely responsible for all subgrades built. Any repairs resulting from inadequate compaction or incorrect grades will be the responsibility of the contractor.
- C. The representatives of the Owner's testing lab will not act as supervisor of construction, nor will they direct construction operations. Neither the presence of the Owner's testing lab representatives nor the testing by the Owner's testing lab shall excuse the contractors or subcontractors for defects or deficiencies discovered in their work during or following completion of the project. Correcting inadequate compaction is the sole responsibility of the contractor.
- D. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the drawings to be salvaged and re-used.
 - 1. Sun damaged or discolored PVC pipe will be rejected.
- E. All materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.

1.9 FEES, PERMITS, AND UTILITY SERVICES

- A. Obtain and pay for permits and service charges required for installation of Work. Arrange for required inspections and secure written approvals from authorities having jurisdiction.
- B. Upon completion of work within right-of-way, provide copies of written final approval to the Architect.

1.10 DELIVERY, STORAGE AND HANDLING

- A. Transport, store and handle in strict accord with the local jurisdiction and manufacturer's written recommendations
- B. Deliver undamaged products to job in manufacturer's sealed containers and/or original bundles with tags and labels intact.

1.11 EXISTING SITE CONDITIONS

- A. Contractor shall acquaint himself with all site conditions. If unknown active utilities are encountered during work, notify Architect promptly for instructions. Failure to notify will make Contractor liable for damage to these utilities arising from Contractor's operations subsequent to discovery of such unknown active utilities.
- B. Existing civil, mechanical and electrical improvements are shown on respective site plans to the extent known. Should the Contractor encounter any deviation between actual conditions and those shown, he is to immediately notify the Architect before continuing work.

1.12 PROTECTION

- A. Adequate protection measures shall be provided to protect workmen and passers-by on and off the site. Adjacent property shall be fully protected throughout the operations. Blasting will not be permitted. Prevent damage to adjoining improvements and properties both above and below grade. Restore such improvements to original condition should damage occur. Replace trees and shrubs outside building area disturbed by operations.
- B. In accordance with generally accepted construction practices, the Contractor shall be solely and completely responsible for working conditions at the job site, including safety of all persons and property during performance of the work. This requirement shall apply continuously and shall not be limited to normal working hours.
- C. Any construction review of the Contractor's performance conducted by the Geotechnical Engineer is not intended to include review of the adequacy of the Contractor's safety measures, in, on, or near the construction site.
- D. Provide shoring, sheeting, sheet piles and or bracing to prevent caving, erosion or gullyng of sides of excavation.
- E. Surface Drainage: Provide for surface drainage during period of construction in manner to avoid creating nuisance to adjacent areas. The contractor shall make a reasonable effort on a daily basis to provide pumps and all equipment necessary to keep all excavations and the site free from water during entire progress of work, regardless of cause, source, or nature of water.
- F. Adjacent streets and sidewalks shall be kept free of mud, dirt or similar nuisances resulting from earthwork operations.
- G. The site and adjacent influenced areas shall be watered as required to suppress dust nuisance. Dust control measures shall be in accordance with the local jurisdiction.
- H. Trees: Carefully protect existing trees that are to remain. Provide temporary irrigation as necessary to maintain health of trees.

1.13 SEASONAL LIMITS

- A. No fill material shall be placed, spread or rolled during unfavorable weather conditions. When work is interrupted by rains, fill operations shall not be resumed until field tests indicate that moisture content and density of fill are satisfactory.

1.14 RECORD DRAWINGS

- A. Keep a daily record of all pipe placed in ground, verified by Project Inspector.
- B. Upon completion of this Contract, furnish one tracing showing all outside utility lines, piping, etc., installed under this Contract. Locate and dimension all work with reference to permanent landmarks.
- C. All symbols and designations used in preparing "RECORD" drawings shall match those used in Contract drawings.
- D. Properly identify on as-builts and provide dimensions for all stubs for future connections. Provide concrete markers 6" dia. 12" deep, flush with finish grade at the ends of all stubbed pipes.
- E. Provide record drawings per Section 01 3300.

PART 2 - PRODUCTS

2.1 DESIGN AND PERFORMANCE CRITERIA

- A. Sustainable Design:
 - 1. VOC emissions for field-applied adhesives, sealants, and sealant primers must comply with limits specified in Section 01 6116.
 - 2. VOC emissions for field-applied paints and coatings must comply with limits specified in Section 01 6116.

2.2 MATERIALS - GENERAL

- A. Provide each item listed herein or shown on drawings of quality noted or approved equal. All material shall be new, full weight, standard in all respects and in first-class condition. Insofar as possible, all materials used shall be of same brand or manufacture throughout for each class of material or equipment. Materials shall be of domestic manufacture and shall be tested within Continental United States.
- B. Grade or quality of materials desired is indicated by trade names or catalog numbers stated herein.
- C. Dimensions, sizes, and capacities shown are minimum and shall not be changed without permission of Architect.
- D. All materials in this section used for any public water system or domestic water for human consumption shall be lead free.

1. For the purposes of this section, "lead free" means not more than 0.2 percent lead when used with respect to solder and flux and not more than 8 percent when used with respect to pipes and pipe fittings.
2. All pipe, pipe or plumbing fitting or fixtures, solder, or flux shall be certified by an independent American National Standards Institute (ANSI) accredited third party, including, but not limited to, NSF International, as being in compliance with this section.

E. All materials used for fire system piping shall be UL and FM approved.

2.3 VALVE BOXES

- A. Provide at each valve or cock in ground a Christy, Brooks, or equal to Christy G05CT, concrete valve box with cover marked for service, domestic water shall be marked "Water" and fire supply shall be marked "Fire". Furnish extension handles for each size square nut valve, and provide "fork" handle for each size of "wheel handle" valve as required. Do not locate valve boxes in walk, or covered passages, curbs, or curb & gutters, unless necessary. If valve location is within concrete or asphalt paved surface valve box shall be as detailed on plans for such condition. Provide valve box extensions as required to set bottom of valve box to bottom of piping in which valve is installed. Provide Owner with set of special wrenches and/or tools as required for operation of valves.

2.4 PIPES AND FITTINGS

- A. Sanitary Sewer: PVC sewer pipe and fittings with Ring-Tite joints, ASTM D3034 SDR35.
- B. Domestic water Lines 3 1/2" and smaller: Type K copper tubing, hard temper, with wrought copper fittings. Schedule 80 PVC, ASTM D 1784, ASTM D 1785.
- C. Water lines 4" and larger: AWWA C-900 Class 150/DR18 with rubber gasket joints.
- D. Fire lines 4" and larger: AWWA C-900 Class 200/DR14 with rubber gasket joints.
- E. Solder: Lead Free. 95/5; 95% Tin / 5% Antimony.
- F. Ductile Iron Pipe; AWWA Class 51, Cement Lined
- G. Ductile Iron Pipe Fittings; AWWA C110, C153, Ebba Iron, Star Romac, Sigma, or approved equal.
- H. PVC Mechanical Fittings; Ebba Iron, Star; Romac; Sigma or approved equal.
- I. Ductile Iron Pipe/PVC C-900 Pipe Restrained Fittings; Ebba Iron # 3800 Mega Coupling, Ebba Iron 1100CH Split Restrained Harness for pipe couplings. StarGrip Series 4000.
- J. Ductile Iron Pipe/PVC C900, C905 Restrained Degreedand Blind Cap Fittings,;
- K. Mega Lug; Sigma; Romac; or an approved equal

UTILITIES
SECTION 33 0000
3595001000

- L. Mechanical Fitting Bolts; Bolts and nuts shall be carbon steel with a minimum 60,000 psi tensile strength conforming to ASTM A 307, Grade A. Bolts shall be standard ANSI B1.1 Class 2A course threads. Nuts shall conform to ASTM A 563 and be standard ANSI B1.1, Class 2A course thread. All bolts and nuts shall be zinc coated.
- M. Fasteners Anti-Rust Coatings; After assembly, coat all fasteners with an Asphaltic Bituminous coatings conforming to latest adopted edition NFPA 24
- N. Ductile Iron Pipe Wrap; 8 mil polyethylene pipe wrap conforming to ANSI/AWWA C105/A21.5 standards.
- O. Pipe Insulation; Pipe exposed to atmospheric conditions ½" thru 4" NPT; Johns Manville rigid fiberglass insulation, Micro Lok HP; Owens Corning Fiberglas SSL II; Conforming to ASTM C 612, Type 1A or type 1B.
- P. Aluminum field applied pipe insulation jacket; comply with ASTM B209, ASTM C1729, ASTM C1371 Manufacturers; Childers Metals; ITW Insulation Systems Aluminum Jacketing; or an approved equal.
 - 1. Finish shall be flat mill finish
 - 2. Factory Fabricated Fitting Covers; 45 and 90 degree elbows, tee's, valve covers, end caps, unions, shall be of the same thickness and finish of jacket.
 - 3. The fittings shall be composed of 2-pieces
 - 4. Adhesives; per the manufacturers requirements
 - 5. Joint Sealant; shall be silicone, and shall be aluminum in color.
- Q. Sewer Forced Main; HDPE, DR 11, color gray with green stripe by JM Eagle or approved equal.

2.5 SANITARY SEWER MANHOLES

- A. Shall be constructed as shown on plan details.

2.6 CLEANOUTS

- A. Cleanouts of same diameter as pipe up to 8" in size shall be installed in all horizontal soil and waste lines where indicated and at all points of change in direction. Cleanouts shall be located not less than 18" from building so as to provide sufficient space for rodding. No horizontal run over 100 feet shall be without cleanout whether shown on drawings or not.
- B. All cleanout boxes shall be traffic rated with labeled lid, Christy G05CT or approved equal. Lid shall be vandal proof with stainless steel screws

2.7 UNIONS

- A. Furnish and install one union at each threaded or soldered connection to equipment and 2 unions, one on each side of valves on pipes ½" to 3".

- B. Locate unions so that piping can be easily disconnected for removal of equipment or valve. Provide type specified in following schedule:

Type of Pipe Union

Steel Pipe:	150 lb. Screwed malleable ground joint, brass, brass-to-iron seat, black or galvanized to match pipe.
-------------	---

Copper tubing:	Brass ground joint with sweat connections.
----------------	--

PVC Sch 80 pipe:	PVC union, FIPT X FIPT
------------------	------------------------

2.8 VALVES

- A. Provide valves as shown and other valves necessary to segregate branches or units. Furnish valves suitable for service intended. Valves shall be properly packed and lubricated. Valves shall be non-rising stem. Place unions adjacent to each threaded or sweat fitting valve. Install valves with bonnets vertical. All valves shall be lead free.
- B. Valves ½" thru 2"; shall be made of bronze, full size of pipe and lead free. Nibco S-113-FL Series; American G-300 Series; Matco 511 FL Series; Apollo 102T-FL Series. Brass valves of brass parts within valves will not be accepted.
- C. Valves, 2 ½" thru 3" shall be class 150; Shall be made of bronze, full size of pipe; Jenkins Fig. 2310 J; Lunkinheimer Fig. 2153; Crane Fig. 437; Stockham Fig. B-128.
- D. Valves, Flanged; 4" thru 12" Ductile Iron Resilient Wedge Gate Valve; Nibco F 609 RW; American 2500 Series; Kennedy 8561; Mueller 2360 Series.

2.9 TAPPING SLEEVE

- A. Shall be used on pipe sizes 6" thru 12" and shall be made with stainless steel material including stainless steel bolts. Flanges shall be ductile iron or high carbon steel. Gaskets shall seal full circumference of pipe. Shall be manufactured for operating pressure of 200 psi, and shall pass test pressure of 300 psi. Romac SST series; Smithblair 662; Mueller H304; Ford "FAST" tapping sleeve.

2.10 SERVICE SADDLES

- A. Shall be used on pipe size 2" thru 4". Body shall be made from ductile iron with epoxy coating or bronze. Cascade Style CSC-1; A.Y. McDonald model 3891 AWWA/3892 FNPT; Smith-Blair #317; Ford S70, S71, S90, (style B).

2.11 TRACER WIRE

- A. No. 10 THW solid copper wire. Solder all joints

PART 3 - EXECUTION

3.1 DRAWINGS AND COORDINATION

- A. General arrangement and location of piping, etc., are shown on Drawings or herein specified. Install work in accord therewith, except for minor changes that may be necessary on account of other work or existing conditions. Before excavation, carefully examine other work that may conflict with this work. Install this work in harmony with other craft and at proper time to avoid delay of work.
- B. Verify invert elevations at points of connection to existing systems prior to any excavation. If invert elevations differ from that shown on drawings, notify Architect immediately.
- C. In advance of construction, work out minor changes if conflicts occur with electrical or mechanical. Relocate services to suit actual conditions and work of other trades to avoid conflict therewith. Any adjustments or additional fittings to make adjustments shall not be cause for additional costs to the owner.
- D. Execute any work or apparatus shown on drawings and not mentioned in specifications, or vice versa. Omission from Drawings or Specifications of any minor details of construction, installation, materials, or essential specialties does not relieve Contractor of furnishing same in place complete.
- E. Graded pipes shall take precedence. If conflict should occur while placing the domestic water and fire service piping, the contractor shall provide any and all fittings necessary to route the water lines over such conflicting pipes at no additional costs to the owner.

3.2 ACCESS

- A. Continuously check for clearance and accessibility of equipment or materials specified herein to be placed. No allowance of any kind shall be made for negligence on part of Contractor to foresee means of installing his equipment or materials into proper position.

3.3 EXCAVATING AND BACKFILLING

- A. Excavation and Bedding:
 - 1. General: Trench straight and true to line and grade with bottom smooth and free of irregularities or rock points. Trench width to be a minimum of 12" wider than outside diameter of pipe. Follow manufacturer's recommendations for use of each kind and type of pipe.
 - 2. Bedding: Provide a bedding as noted on drawing details for the full length of the pipe. Bedding shall have a minimum thickness beneath the pipe of 4" or 1/8 the outside diameter of the pipe, which ever is greater. Provide bell holes and depressions for pipe joints only of size required to properly make joint.
 - 3. If the trenches for the site utilities falls within areas to be lime treated, the piping shall be installed prior to any lime treatment operations, providing the elevation of the piping is below the treatment section.

UTILITIES
SECTION 33 0000
3595001000

- a. If trenching is necessary in areas that have been previously lime treated the contractor shall backfill the trench with class 2 aggregate base, with minimum section equal to the lime treated section and compacted to 95%.

B. Laying of Pipe:

- 1. General: Inspect pipe prior to placing. Sun damaged pipe will be rejected. Set aside any defective or damaged material. Do not place pipe in water nor place pipe when trenches or weather are unsuitable. Lay pipe bell up grade, true to line and grade.
 - a. Sewer pipe shall be laid in strict conformity to the prescribed line and grade, with grade bars set and each pipe length checked to the grade line. Three consecutive points on the same rate of slope shall be used at all times to detect any variation from a straight grade. In any case of discrepancy, work shall be stopped and the discrepancy immediately reported to the Owner's Representatives. In addition, when requested by the Owner's Representative, a string line shall be used in the bottom of the trench to insure a straight alignment of the sewer pipe between manholes. The maximum deviation from grade shall not be in excess of 1/4 inch. In returning the pipe to grade, no more than 1/4" depression shall result.
 - b. The Contractor shall expose the end of existing pipe to be extended, for verification of alignment and elevation, prior to trenching for any pipe which may be affected. All costs of such excavation and backfill shall be included in the price paid for the various items of work.
 - c. A temporary plug, mechanical type shall be installed on sewer pipe at the point of connection to existing facilities. If connecting to a public facility the plug shall conform to the requirements of the local jurisdiction. This plug shall remain in place until the completion of the balling and flushing operation.
- 2. Bell and Spigot Joints: Lubricate inside of bells and outside of spigots with soap solution. Wedge joints tight. Bell of bell and spigot pipe to be pointed up grade.

C. Backfilling:

- 1. General: Do not start backfill operations until required testing has been accomplished.
- 2. Compaction and Grading: Remainder of backfill shall be in accordance with Section 31 2333 – TRENCHING AND BACKFILLING.
- 3. If trenching in area previously lime or cement treated backfill top of trench section, same depth as lime or cement treatment with Class 2 Aggregate Base compacted to 95% minimum relative compaction.

3.4 INSTALLATION OF WATER PIPING

- A. Immediately cap or plug ends of, and opening in, pipe and fittings to exclude dirt until final connections made. Use reducing fittings where any change in pipe size occurs. Bushings shall not be used.

- B. General: Should existing conditions or other work prevent the running of pipes or the setting of equipment at the points indicated by drawings, changes as authorized by the Architect shall be made without additional cost to the Owner.
- C. All bolts used on mechanical fittings shall be thoroughly coated with an asphaltic bituminous coating conforming to 2022 NFPA (National Fire Protection Association) 10.3.5.2 and 10.8.3.5, CBC chapter 35 and CFC chapter 80.
- D. All buried metal shall be incased with 8 mil polyethylene wrap so that no soil is in contact with metal. Ends of polyethylene wrap shall be taped to provide seal with pipe.
- E. Do not install water lines in same trench with non-metallic sewer lines unless bottom of water pipe at all points is at least 12" above top of sewer line and water line is placed on solid shelf excavated at one side of common trench with a minimum of 12 inch horizontal separation.
- F. Under no circumstance shall a fitting be located directly under a structural footing without prior approval from the Architect.
- G. In locations where existing domestic pipe is rerouted, the new pipe shall be assembled using restrained fittings at all joints including factory pipe joints. Tapped restrained blind flanges shall be temporarily installed at each end of the assembled pipes until testing and chlorination is completed and approved.

3.5 CLOSING IN OF UNINSPECTED WORK

- A. Do not allow or cause work installed to be covered up or enclosed before it has been inspected, tested, and approved. Should work be enclosed or covered up before it has been approved, uncover work at own expense. After it has been inspected, tested and approved, make repairs necessary to restore work of other contractors to condition in which it was found at time of cutting.

3.6 CARE AND CLEANING

- A. Repair or replace broken, damaged, or otherwise defective parts, materials, and work. Leave entire work in new condition satisfactory to Architect. At completion, carefully clean and adjust equipment, fixtures and trim that are installed as part of this work. Leave systems and equipment in satisfactory new operating condition.
- B. Drain and flush piping to remove grease and foreign matter.
- C. Sewer piping shall be balled and flushed.
- D. Clean out and remove surplus materials and debris resulting from the work, including surplus excavated material.
- E. Flush fire service piping in the presence of the project inspector. Flushing shall be continued for a sufficient time as necessary to ensure all foreign material has been removed. Flow rate shall be equal to site fire flow requirements.

3.7 SEWER INTERNAL INSPECTIONS

- A. Upon completion of construction and prior to final inspection, the Contractor shall clean the entire new pipeline of all dirt and debris. Any dirt or debris in previously existing pipes or ditches in the area, which resulted from the new installation, shall also be removed. Pipes shall be cleaned by the controlled balling and flushing method. Temporary plugs shall be installed and maintained during cleaning operations at points of connection to existing facilities to prevent water, dirt, and debris from entering the existing facility.

3.8 TEST OF PIPING

- A. Pressure Test piping at completion of roughing-in, in accord with following schedule, and show no loss in pressure or visible leaks after minimum duration or four (4) hours at test pressures indicated.
- B. Chlorination tests shall be performed after all fixtures and any required mechanical devices are installed and the entire system is complete and closed up.
- C. In cases where new domestic water piping is assembled for re-routing of existing domestic water pipe, the contractor shall perform the following testing prior to connecting the new water pipe to the existing system.
 - 1. The pipe shall be pressure tested and per the test schedule.
 - 2. The pipe shall be pressure tested down within the trench.
 - 3. The contractor shall dig a temporary ditch below the existing pipe to drain to a sump that is lower than the bottom of the trench and to the side of the trench. The sump shall be 30% larger than the total volume of water within the testing pipe assembly.
 - 4. After pressure testing and chlorination has taken place and accepted, the contractor shall drain the pipe into the sump and pump the sump out as it is filling.
 - 5. The temporary test fittings at each end of the pipe assembly shall be removed and the final restrained couplings installed.
 - 6. The existing piping shall be cut and the water within the pipe shall drain below the pipe to the temporary sump. Pump the sump as it is being filled up. Take extreme caution not to contaminate the existing pipe with any contaminants within the trench.
 - 7. Before making the final coupling connections, the restrained couplings at each end of the new pipe shall be thoroughly swabbed inside the fitting with a solution of chlorine mixed with water at a rate of 1 part chlorine to 4 parts potable water.
 - 8. After final connections are made, a visual inspection shall be made after fittings are wiped off. If after 1 hr, no noticeable drips are noted the pipe can be backfilled.
 - 9. The contractor shall flush all water piping affected by chlorination until it is within acceptable levels approved by certified testing lab.

TEST SCHEDULE

<u>System Tested</u>	<u>Test Pressure PSIG Test With</u>
Public Water Mains	Per local jurisdiction requirements.
Private Domestic Water Piping:	150 Lbs. Water 4 hrs.
Fire Protection Piping:	200 Lbs. Water pressure, 4 hrs duration with no pressure loss.
Sanitary Sewer Piping:	Sewer system shall be tested for leakage per local jurisdiction requirements.

- D. Testing equipment, materials, and labor shall be furnished by contractor.

3.9 WATER SYSTEM STERILIZATION

- A. Public Water Mains: Shall be flushed and disinfected per the local jurisdiction requirements
- B. Clean and disinfect all site water systems connected to the domestic water systems in accordance with AWWA Standard C651 and as required by the local Building and Health Department Codes, and EPA.
 - 1. Clean and disinfect industrial water system in addition to the domestic water system.
 - 2. Disinfect existing piping systems as required to provide continuous disinfection upstream to existing valves. At Contractors option, valves may be provided to isolate the existing piping system from the new piping system.
- C. Domestic water sterilization shall be performed by a licensed "qualified applicator" as required by CAL-EPA Pesticide Enforcement Branch for disinfecting and sterilizing drinking water.
- D. Disinfecting Agent: Chlorine product that is a registered product with Cal-EPA for use in California potable water lines, such as Bacticide, CAL-EPA Registration No. 37982-20001.
- E. Contractor to provide a 1" service valve connected to the system at a point within 2'-0" of its junction with the water supply line. After sterilization is complete Contractor to provide cap at valve.
- F. Sterilization Procedure to be as follows:
 - 1. Flush pipe system by opening all outlets and letting water flow through the system until clear water flows from all outlets.

UTILITIES
SECTION 33 0000
3595001000

2. Inject disinfecting agent to provide a minimum chlorine residual concentration of at least 50 parts per million (ppm) of free chlorine at each outlet.
 3. Provide sign at all outlets which reads "Water Sterilization in Progress – Do not operate". Remove signs at conclusion of test.
 4. Close all outlets and valves, including valve connecting to water supply line and 1" service valve. Retain treated water in pipe for a minimum of twenty-four hours. Should chlorine residual at pipe extremities be less than 50 PPM at this time, pipe shall be re-chlorinated. As an option, the water systems may be filled with a water-chlorine solution containing a minimum of 200 PPM of chlorine and allowed to stand for three hours.
 5. After chlorination, flush lines of chlorinated water and refill from domestic supply. Continue flushing until residual chlorine is less than or equal to 0.2 ppm, or a residual the same as that of the test water.
- G. Chemical and bacteriological tests shall be conducted by a state-certified laboratory and approved by the local authorities having jurisdiction.
- H. Submit written report to Health Department as required by State Regulations. Provide a copy of report to Architect prior to completion of project.
- I. The costs of sterilization and laboratory testing shall be paid for by the contractor.

3.10 CLEANING

- A. Upon completion of work of this Section promptly remove from the working area all scraps, debris and surplus material of this Section.

END OF SECTION

s:\master specifications\division 33 - utilities\33 0000_utilities.docx
Formatting Updated: 9-13-21

PART 1 - GENERAL

1.1 SUMMARY

- A. Summary Includes:
 - 1. Storm drainage piping systems.

1.2 RELATED REQUIREMENTS

- A. Section 01 5000, Construction Facilities and Controls.
- B. Section 01 6116, Volatile Organic Compound (VOC) Restrictions, for VOC limits pertaining to adhesives, sealants, fillers, primers, and coatings.
- C. Section 01 8113, Sustainable Design Requirements, for CAL-Green **[and Collaborative for High Performance Schools (CHPS)]** general requirements and procedures.
- D. Section 31 0000, Earthwork.
- E. Section 31 2333, Trenching and Backfilling.
- F. Section 32 1200, Asphalt Concrete Paving.
- G. Section 32 1600, Site Concrete

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CAL Green), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- C. California Plumbing Code, (CPC), edition as noted on the Drawings.
- D. Local Jurisdiction: Any work within the street, highway or right-of-way shall be performed in accordance with the requirement of the governmental agencies having jurisdiction, and shall not begin until all of those governing authorities have been notified.
- E. ASTM International (ASTM):
 - 1. D 422-63 Test Method for Particle Size Analysis of Soil.
 - 2. D698-00 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures, Using 5.5 lb (2.49 Kg) Rammer and 12 inch (304.8 mm) Drop.
 - 3. D1556-00 - Test Method for Density of Soil in Place by the Sand-Cone Method.
 - 4. D1557-02 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 10 lb. (4.54 Kg) Rammer and 18 inch (457 mm) Drop.

STORM DRAINAGE UTILITIES
SECTION 33 4000
3595001000

5. D 3017-05 Test Methods for Moisture Content of Soils and Soil-Aggregate Mixture by Nuclear Methods (Shallow Depth).
6. D 4318-05 Test Method for Liquid Limit, Plastic Limit, and Plasticity Limit.

F. CALTRANS Standard Specifications.

G. CAL-OSHA, Title 8, Section 1590 (e).

1.4 ADMINISTRATIVE REQUIREMENTS

A. Submittal Procedures:

1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
3. Sustainable Design Submittals shall comply with the additional requirements of Section 01 8113, Sustainable Design Requirements.

1.5 ACTION SUBMITTALS

- A. Provide supplier's descriptive literature for all products to demonstrate compliance with specified attributes.
- B. Substitution: Provide all data of proposed material being submitted as a substitution. Provide comparison with specified product data and identify all differences. Failure to provide comparison will be reason for rejection.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: Contractor / installer.
- B. Provide sieve analysis from accredited testing lab on pipe bedding material. Analysis shall have a current date not older than project contract signing date.
- C. Sustainable Design:
1. General:
 - a. Submit information necessary to establish and document compliance with the California Green Building Standards Code.
 - b. Sustainable design submittals are in addition to other submittals.
 2. The following information shall be provided:
 - a. Adhesives and Sealants: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.
 - b. Paints and Coatings: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.

1.7 CLOSEOUT SUBMITTALS

- A. Guarantee: Submit subcontractor's guarantee.

1.8 QUALITY ASSURANCE

- A. Contractor / Installer shall have been in business for five (5) years providing/finishing similar size projects and complexity.
- B. Contractor shall be solely responsible for all subgrades built. Any repairs resulting from inadequate compaction are the responsibility of the contractor.
- C. The representatives of the Owner's testing lab will not act as supervisor of construction, nor will they direct construction operations. Neither the presence of the Owner's testing lab representatives nor the testing by the Owner's testing lab shall excuse the contractors or subcontractors for defects discovered in their work during or following completion of the project. Correcting inadequate compaction is the sole responsibility of the contractor.
- D. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.
 - 1. Sun damaged or discolored PVC pipe will be rejected.
- E. All materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.

1.9 DELIVERY, STORAGE AND HANDLING

- A. Transport, store and handle in strict accord with the local jurisdiction and manufacturer's written recommendations
- B. Deliver undamaged products to job in manufacturer's sealed containers and/or original bundles with tags and labels intact.

1.10 EXISTING SITE CONDITIONS

- A. Contractor shall acquaint himself with all site conditions. If unknown active utilities are encountered during work, notify Architect promptly for instructions. Failure to notify will make Contractor liable for damage to these utilities arising from Contractor's operations subsequent to discovery of such unknown active utilities.
- B. Existing civil, mechanical and electrical improvements are shown on respective site plans to the extent known. Should the Contractor encounter any deviation between actual conditions and those shown, he is to immediately notify the Architect before continuing work.

1.11 PROTECTION

- A. Adequate protection measures shall be provided to protect workmen and passers-by on and off the site. Adjacent property shall be fully protected throughout the operations.

STORM DRAINAGE UTILITIES
SECTION 33 4000
3595001000

Blasting will not be permitted. Prevent damage to adjoining improvements and properties both above and below grade. Restore such improvements to original condition should damage occur. Replace trees and shrubs outside building area disturbed by operations.

- B. In accordance with generally accepted construction practices, the Contractor shall be solely and completely responsible for working conditions at the job site, including safety of all persons and property during performance of the work. This requirement shall apply continuously and shall not be limited to normal working hours.
- C. Any construction review of the Contractor's performance conducted by the Geotechnical Engineer is not intended to include review of the adequacy of the Contractor's safety measures, in, on, or near the construction site.
- D. Provide shoring, sheeting, sheet piles and/or bracing to prevent caving, erosion or gullyng of sides of excavation.
- E. Surface Drainage: Provide for surface drainage during period of construction in manner to avoid creating nuisance to adjacent areas. The contractor shall make a reasonable effort on a daily basis to provide pumps and all equipment necessary to keep all excavations and the site free from water during entire progress of work, regardless of cause, source, or nature of water.
- F. Adjacent streets and sidewalks shall be kept free of mud, dirt or similar nuisances resulting from earthwork operations.
- G. The site and adjacent influenced areas shall be watered as required to suppress dust nuisance. Dust control measures shall be in accordance with the local jurisdiction.
- H. Trees: Carefully protect existing trees that are to remain.

1.12 SEASONAL LIMITS

- A. No fill material shall be placed, spread or rolled during unfavorable weather conditions. When work is interrupted by rains, fill operations shall not be resumed until field tests indicate that moisture content and density of fill are satisfactory.

1.13 TESTING

- A. General: Refer to Section 01 4523 – Testing and Inspection Services, and Structural Tests and Inspections List, DSA-103.
- B. Geotechnical Engineer: Owner is retaining a Geotechnical Engineer to determine compliance of fill with Specifications, and to direct adjustments in fill operations. Costs of Geotechnical Engineer will be borne by Owner; except those costs incurred for re-tests or re-inspection will be paid by Owner and backcharged to Contractor.

1.14 RECORD DRAWINGS

- A. Keep a daily record of all pipe placed in ground, verified by Project Inspector.

STORM DRAINAGE UTILITIES
SECTION 33 4000
3595001000

- B. Upon completion of this Contract, furnish one tracing showing all outside utility lines, piping, etc., installed under this Contract. Locate and dimension all work with reference to permanent landmarks.
- C. All symbols and designations used in preparing "RECORD" drawings shall match those used in Contract drawings.
- D. Properly identify all stubs for future connections, as to location and use, by setting of concrete marker at finished grade in the manner suitable to Architect.

PART 2 - PRODUCTS

2.1 DESIGN AND PERFORMANCE CRITERIA

- A. Sustainable Design:
 - 1. VOC emissions for field-applied adhesives, sealants, and sealant primers must comply with limits specified in Section 01 6116.
 - 2. VOC emissions for field-applied paints and coatings must comply with limits specified in Section 01 6116.

2.2 MATERIALS

- A. Pipe: Use one of the following, unless noted on the Drawings otherwise.
 - 1. Polyvinyl Chloride Pipe (PVC): SDR35 conforming to ASTM D3034 with elastomeric joints conforming to ASTM D3212 for pipe to 12". Sun damaged pipe will be rejected.
 - 2. High density polyethylene pipe (HDPE): The pipe shall be corrugated exterior/smooth interior pipe. 12" to 60" maximum diameter shall conform to AASHTO M294, water tight per ASTM D3212 with water tight gasket fittings.
- B. Perforated Pipe (for subdrains): Shall be ADS N12 pipe, 3 hole, ASTM F 405, AASHTO M 252; PCV ASTM D3034 SDR-35 storm drain pipe
- C. Manhole: Shall be as shown on the drawing details.
- D. Drop Inlet: Shall be as shown on the drawing details.
- E. Curb Inlet: Shall be as shown on the drawing details.
- F. Mortar: For pipe connections to concrete drainage structures, conform to ASTM C270 type N mortar. Place within one half hour after adding water.
- G. Crushed Rock: Imported washed crushed rock. Minimum 100% passing 3/4 inch sieve.
- H. Trench drain: Polycast, Polydrain or equal and as shown on drawings.
- I. Area Drains: Shall be as shown on the drawing details.

STORM DRAINAGE UTILITIES
SECTION 33 4000
3595001000

- J. Floor Drains: Shall be as shown on the drawing details.
- K. Clean-outs: Shall be as shown on the drawing details.
- L. Planter drains: Shall be as detailed on the drawing details.
- M. Filter Fabric: Mirafi 140N.

PART 3 - EXECUTION

3.1 INSPECTION LAYOUT AND PREPARATION

- A. Prior to installation of the work of this Section, carefully inspect and verify by field measurements that installed work of all other trades is complete to the point where this installation may properly commence
- B. Layout all work, establish grades, locate existing underground utilities, set markers and stakes, setup and maintain barricades and protection facilities; all prior to beginning actual earthwork operations. Layout and staking shall be done by a licensed Land Surveyor or Professional Civil Engineer.
- C. Verify that specified items may be installed in accordance with the approved design.
- D. In event of discrepancy, immediately notify Owner and the Architect. Do not proceed in discrepant areas until discrepancies have been fully resolved.

3.2 EXCAVATION AND BACKFILLING

- A. General: Installation shall be in strict conformance with referenced standards, the manufacturer's written directions, as shown on the drawings and as herein specified.
- B. Verify invert elevations at points of connection to existing systems prior to any excavation. If invert elevations differ from that shown on drawings, notify Architect immediately.
- C. Excavation and Bedding:
 - 1. General: Trench straight and true to line and grade with bottom smooth and free of irregularities or rock points. Trench width in accordance with pipe manufacturer's recommendations and as per the drawings. Follow manufacturer's recommendations for use of each kind and type of pipe.
 - 2. Bedding: Provide bedding as detailed on plans for the full length of the pipe. Bedding shall have a minimum thickness beneath the pipe of 4" or 1/8 the outside diameter of the pipe, whichever is greater. Provide bell holes and depressions for pipe joints only of size required to properly make joint.
 - 3. If the trenches for the site drainage fall within areas to be lime treated, the piping shall be installed prior to any lime treatment operations.
 - a. If additional piping is added to previously lime treated areas, the contractor shall backfill the trench with class 2 aggregate base and compact to 95%.

STORM DRAINAGE UTILITIES
SECTION 33 4000
3595001000

D. Laying of Pipe:

1. General: Inspect pipe prior to placing. Set aside any defective or damaged material. Do not place pipe in water nor place pipe when trenches or weather are unsuitable. Lay pipe upgrade, true to line and grade.
2. Bell and Spigot Joints: Lubricate inside of bells and outside of spigots with soap solution or as recommended by manufacture. Wedge joints tight. Bell of bell and spigot pipe to be pointed upgrade.
3. Pipe shall be bedded uniformly throughout its length.
4. Pipe elevation shall be within 0.02 feet of design elevation as shown on plans.
5. Off Site Work: All work beyond the property lines shall be done in strict conformance with the requirements of the governing agency.

E. Backfilling:

1. General: Do not start backfill operations until required testing has been accomplished.
2. Trenches and Excavations: Backfill with material as detailed on plans, filling both sides of the pipe at the same time, carefully tamping to hold pipe in place without movement. Refer to Section 31 2333 – TRENCHING AND BACKFILLING for fill above this layer.

F. Grouting of Pipes: Grout pipes smooth and water tight at drop inlet, manholes, and curb inlets. Grout back side of hood at curb inlets all grouting shall be smooth and consistent.

G. Off Site Work: All work beyond the property lines shall be done in strict conformance with the requirements of the local agency.

H. Cutting and Patching: Remove and replace existing surface features per applicable specification section (i.e. asphaltic concrete or concrete paving) where pipe is installed in areas of existing improvements.

3.3 TOLERANCES

A. Storm Drain structure grates

1. In landscape and lawn areas $\pm 0.05'$.
2. In sidewalk and asphalt pavement $\pm 0.025'$.
3. In curb and gutter application $\pm 0.0125'$.

B. Cleanout Boxes and Lids

1. In landscape areas; 0.10 higher than surrounding finish grade, $\pm 0.05'$.
2. In sidewalks and asphalt pavement; Flush with surrounding finish grade, $\pm 0.025'$.

3.4 DEWATERING

A. Contractor to provide trench dewatering as necessary, no matter what the source is, at no additional cost to the owner.

STORM DRAINAGE UTILITIES
SECTION 33 4000
3595001000

3.5 FLUSHING

- A. The Contractor shall thoroughly ball and flush the storm drain system to remove all dirt and debris. Discharge water to an approved location.

3.6 CLEANING

- A. Upon completion of work of this Section promptly remove from the working area all scraps, debris and surplus material of this Section.
- B. Clean the dirt, rocks, and debris from the drop inlets and storm drain manholes.

END OF SECTION

**Louis Bohn Elementary School - TK
Portable Classroom Building**

350 E. Mt. Diablo Ave., Tracy, CA 95376

3595001

Tracy Unified School District

1875 W Lowell Ave., Tracy, CA 95376



April 04, 2024

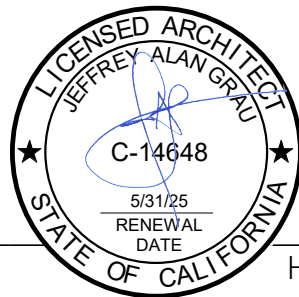
Louis Bohn Elementary School - TK Portable Classroom Building
Tracy Unified School District
Tracy, California

February 29, 2024

HMC # 3595001

DSA Appl. #02-122127
DSA File #39-73

IDENTIFICATION STAMP	
DIV. OF THE STATE ARCHITECT	
APP: 02-122127 INC:	
REVIEWED FOR	
SS <input checked="" type="checkbox"/>	FLS <input checked="" type="checkbox"/> THE STATE ARCHITECT
DATE: 04/12/2024	



HMC ARCHITECTS
Architect



Warren Consulting Engineers
Civil Engineer



Optimized Energy & Facilities Consulting
Electrical Engineer



MTW Group
Landscape Architect

TABLE OF CONTENTS

DIVISION 00 - PROCUREMENT AND CONTRACTING REQUIREMENTS - NOT USED

DIVISION 01 - GENERAL REQUIREMENTS

SECTION	01 1100 - Summary of Work
	01 2513 - Product Options and Substitutions
	01 2600 - Changes in the Work
	01 2900 - Application for Payment and Conditional and Unconditional Waiver and Release Forms
	01 3119 - Project Meetings
	01 3213 - Scheduling of Work
	01 3300 - Submittal Procedures (Including Submittal Transmittal, Substitution Request, RFI, Electronic Data Request, Megger Grounding Test Certificate, Certification of Chlorination and Sterilization, Certification of Compliance for Building Materials)
	01 3513.23 - Site Standards
	01 3543 - Environmental Procedures
	01 4100 - Regulatory Requirements
	01 4213 - Abbreviations and Acronyms
	01 4216 - Definitions
	01 4219 - References
	01 4300 - Materials and Equipment
	01 4500 - Quality Control
	01 4523 - Testing and Inspection Services
	01 5000 - Temporary Facilities and Controls
	01 5013 - Construction Waste Management and Disposal
	01 5213 - Field Offices
	01 6116 - Volatile Organic Compound (VOC) Restrictions
	01 6600 - Product Delivery Storage and Handling
	01 7329 - Cutting and Patching
	01 7600 - Alteration Project Procedures
	01 7700 - Contract Closeout and Final Cleaning
	01 7823 - Operation and Maintenance Data
	01 7836 - Warranties (Including Contractor Standard Warranty Form, Subcontractor Standard Warranty Form, Special Extended Warranty Form)
	01 7839 - Record Documents
	01 8113 - Sustainable Design Requirements

DIVISION 02 - EXISTING CONDITIONS - NOT USED

DIVISION 03 - CONCRETE - NOT USED

DIVISION 04 - MASONRY - NOT USED

DIVISION 05 - METALS - NOT USED

DIVISION 06 - WOOD, PLASTICS, AND COMPOSITES - NOT USED

DIVISION 07 - THERMAL AND MOISTURE PROTECTION

SECTION	07 9200 - Joint Sealants
---------	--------------------------

DIVISION 08 - OPENINGS - NOT USED

DIVISION 09 - FINISHES

SECTION	09 9100 - Painting
---------	--------------------

DIVISION 10 - SPECIALTIES

SECTION	10 1116 - Markerboards
---------	------------------------

TABLE OF CONTENTS

10 1400 - Signage
10 2813 - Toilet Accessories
10 4416 - Fire Extinguishers and Cabinets

DIVISION 11 - EQUIPMENT - NOT USED

DIVISION 12 - FURNISHINGS

SECTION 12 2113 - Horizontal Louver Blinds
12 3216 - Manufactured Plastic-Laminate-Clad Casework
12 3623 - Plastic-Laminate-Clad Countertops

DIVISION 13 - SPECIAL CONSTRUCTION - NOT USED

DIVISION 14 - CONVEYING EQUIPMENT - NOT USED

DIVISION 21 - FIRE SUPPRESSION - NOT USED

DIVISION 22 - PLUMBING - NOT USED

DIVISION 23 - HEATING, VENTILATING AND AIR CONDITIONING (HVAC) - NOT USED

DIVISION 26 - ELECTRICAL

SECTION 26 0100 - Electrical Basic Requirements
26 0533 - Raceway and Boxes for Electrical Systems
26 2716 - Cabinets and Enclosures
26 2800 - Circuit Protective Devices
26 6116 - Fire Alarm

DIVISION 27 - COMMUNICATIONS

SECTION 27 1000 - Data Communications
27 5123 - Sound and Communications

DIVISION 28 - ELECTRONIC SAFETY AND SECURITY

SECTION 28 3100 - Intrusion Alarm System

DIVISION 31 - EARTHWORK

SECTION 31 0000 - Earthwork
31 2333 - Trenching and Backfilling

DIVISION 32 - EXTERIOR IMPROVEMENTS

SECTION 32 1600 - Site Concrete
32 3113 - Chain Link Fences and Gates
32 8000 - Irrigation
32 9000 - Landscaping

DIVISION 33 - UTILITIES

SECTION 33 0000 - Utilities
33 4000 - Storm Drainage Utilities

"All rights reserved. This Project Manual or any part hereof may not be duplicated without the written consent of Rainforth Grau Architects except in the form of excerpts or quotations for the purpose of review."

SUMMARY OF WORK

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Site Access Conditions and Requirements;
- B. Special Conditions.

1.02 SUMMARY OF WORK COVERED BY CONTRACT DOCUMENTS

- A. The Work of this Contract consists of the following at Louis Bohn Elementary School:
 - (1) Selective demolition and construction for preparation of the site to receive 1 - 36'x40' relocatable building, including associated civil, architectural and electrical work as indicated in the drawings.

1.03 CONTRACTS

- A. Perform the Work under a single, fixed-price Contract.

1.04 WORK BY OTHERS

- A. Construction of 1 - 36'x40' classroom building by portable manufacturer

1.05 CODES, REGULATIONS, AND STANDARDS

- A. The codes, regulations, and standards adopted by the state and federal agencies having jurisdiction shall govern minimum requirements for this Project. Where codes, regulations, and standards conflict with the Contract Documents, these conflicts shall be brought to the immediate attention of the District and the Architect.
- B. Codes, regulations, and standards shall be as published effective as of date of bid opening, unless otherwise specified or indicated.

1.06 PROJECT RECORD DOCUMENTS

- A. Contractor shall maintain on Site one set of the following record documents; Contractor shall record actual revisions to the Work:
 - (1) Contract Drawings.
 - (2) Specifications.

- (3) Addenda.
 - (4) Change Orders and other modifications to the Contract.
 - (5) Reviewed shop drawings, product data, and samples.
 - (6) Field test records.
 - (7) Inspection certificates.
 - (8) Manufacturer's certificates.
- B. Contractor shall store Record Documents separate from documents used for construction. Provide files, racks, and secure storage for Record Documents and samples.
 - C. Contractor shall record information concurrent with construction progress.
 - D. Specifications: Contractor shall legibly mark and record at each product section of the Specifications the description of the actual product(s) installed, including the following:
 - (1) Manufacturer's name and product model and number.
 - (2) Product substitutions or alternates utilized.
 - (3) Changes made by Addenda and Change Orders and written directives.

1.07 EXAMINATION OF EXISTING CONDITIONS

- A. Contractor shall be held to have examined the Project Site and acquainted itself with the conditions of the Site and of the streets or roads approaching the Site.
- B. Prior to commencement of Work, Contractor shall survey the Site and existing buildings and improvements to observe existing damage and defects such as cracks, sags, broken, missing or damaged glazing, other building elements and Site improvements, and other damage.
- C. Should Contractor observe cracks, sags, and other damage to and defects of the Site and adjacent buildings, paving, and other items not indicated in the Contract Documents, Contractor shall immediately report same to the District and the Architect.

1.08 CONTRACTOR'S USE OF PREMISES

- A. If unoccupied and only with District's prior written approval, Contractor may use the building(s) at the Project Site without limitation for its operations, storage, and office facilities for the performance of the Work. If the District chooses to beneficially occupy any building(s), Contractor must obtain the District's written approval for Contractor's use of spaces and types of operations to be performed within the building(s) while so occupied. Contractor's access to the building(s) shall be limited to the areas indicated.

- B. If the space at the Project Site is not sufficient for Contractor's operations, storage, office facilities and/or parking, Contractor shall arrange and pay for any additional facilities needed by Contractor.
- C. Contractor shall not interfere with use of or access to occupied portions of the building(s) or adjacent property.
- D. Contractor shall maintain corridors, stairs, halls, and other exit-ways of building clear and free of debris and obstructions at all times.
- E. No one other than those directly involved in the demolition and construction, or specifically designated by the District or the Architect shall be permitted in the areas of work during demolition and construction activities.
- F. The Contractor shall install the construction fence and maintain that it will be locked when not in use. Keys to this fencing will be provided to the District.

1.09 PROTECTION OF EXISTING STRUCTURES AND UTILITIES

- A. The Drawings show above-grade and below-grade structures, utility lines, and other installations that are known or believed to exist in the area of the Work. Contractor shall locate these existing installations before proceeding with excavation and other operations that could damage same; maintain them in service, where appropriate; and repair damage to them caused by the performance of the Work. Should damage occur to these existing installations, the costs of repair shall be at the Contractor's expense and made to the District's satisfaction.
- B. Contractor shall be alert to the possibility of the existence of additional structures and utilities. If Contractor encounters additional structures and utilities, Contractor will immediately report to the District for disposition of same as indicated in the General Conditions.

1.10 UTILITY SHUTDOWNS AND INTERRUPTIONS

- A. Contractor shall give the District a minimum of three (3) days written notice in advance of any need to shut off existing utility services or to effect equipment interruptions. The District will set exact time and duration for shutdown, and will assist Contractor with shutdown. Work required to re-establish utility services shall be performed by the Contractor.
- B. Contractor shall obtain District's written approval as indicated in the General Conditions in advance of deliveries of material or equipment or other activities that may conflict with District's use of the building(s) or adjacent facilities.

1.11 STRUCTURAL INTEGRITY

- A. Contractor shall be responsible for and supervise each operation and work that could affect structural integrity of various building elements, both permanent and temporary.
- B. Contractor shall include structural connections and fastenings as indicated or required for complete performance of the Work.

PART 2 – PRODUCTS Not Used.

PART 3 – EXECUTION Not Used.

END OF DOCUMENT

PRODUCT OPTIONS AND SUBSTITUTIONS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. Instructions to Bidders;
- B. General Conditions, including, without limitation, Substitutions For Specified Items; and
- C. Special Conditions.

1.02 SUBSTITUTIONS OF MATERIALS AND EQUIPMENT

- A. Catalog numbers and specific brands or trade names followed by the designation "or equal" are used in conjunction with material and equipment required by the Specifications to establish the standards of quality, utility, and appearance required. Substitutions which are equal in quality, utility, and appearance to those specified may be reviewed subject to the provisions of the General Conditions.
- B. Wherever more than one manufacturer's product is specified, the first-named product is the basis for the design used in the work and the use of alternative-named manufacturers' products or substitutes may require modifications in that design. If such alternatives are proposed by Contractor and are approved by the District and/or the Architect, Contractor shall assume all costs required to make necessary revisions and modifications of the design resulting from the substitutions requested by the Contractor.
- C. When materials and equipment are specified by first manufacturer's name and product number, second manufacturer's name and "or approved equal," supporting data for the second product, if proposed by Contractor, shall be submitted in accordance with the requirements for substitutions. The District's Board has found and determined that certain item(s) shall be used on this Project based on the purpose(s) indicated pursuant to Public Contract Code section 3400(c). These findings, as well as the products and brand or trade names, have been identified in the Notice to Bidders.
- D. The Contractor will not be allowed to substitute specified items unless the request for substitution is submitted as follows:
 - (1) District must receive any notice of request for substitution of a specified item a minimum of ten (10) calendar days prior to bid opening.

- (2) Within 35 days after the date of the Notice of Award, the Contractor shall submit data substantiating the request(s) for all substitution(s) containing sufficient information to assess acceptability of product or system and impact on Project, including, without limitation, the requirements specified in the Special Conditions and the technical Specifications. Insufficient information shall be grounds for rejection of substitution.
- E. If the District and/or Architect, in reviewing proposed substitute materials and equipment, require revisions or corrections to be made to previously accepted Shop Drawings and supplemental supporting data to be resubmitted, Contractor shall promptly do so. If any proposed substitution is judged by the District and/or Architect to be unacceptable, the specified material or equipment shall be provided.
- F. Samples may be required. Tests required by the District and/or Architect for the determination of quality and utility shall be made at the expense of Contractor, with acceptance of the test procedure first given by the District.
- G. In reviewing the supporting data submitted for substitutions, the District and/or Architect will use for purposes of comparison all the characteristics of the specified material or equipment as they appear in the manufacturer's published data even though all the characteristics may not have been particularly mentioned in the Contract Documents. If more than two (2) submissions of supporting data are required, the cost of reviewing the additional supporting data shall be borne by Contractor, and the District will deduct the costs from the Contract Price. The Contractor shall be responsible for any re-design costs occasioned by District's acceptance and/or approval of any substitute.
- H. The Contractor shall, in the event that a substitute is less costly than that specified, credit the District with one hundred percent (100%) of the net difference between the substitute and the originally specified material. In this event, the Contractor agrees to execute a deductive Change Order to reflect that credit. In the event Contractor furnishes a material, process, or article more expensive than that specified, the difference in the cost of that material, process, or article so furnished shall be borne by Contractor.
- I. In no event shall the District be liable for any increase in Contract Price or Contract Time due to any claimed delay in the evaluation of any proposed substitute or in the acceptance or rejection of any proposed substitute.

PART 2 – PRODUCTS Not Used.

PART 3 – EXECUTION Not Used.

END OF DOCUMENT

DOCUMENT 01 26 00

CHANGES IN THE WORK

CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE PROVISIONS IN THE AGREEMENT, GENERAL CONDITIONS, AND SPECIAL CONDITIONS, IF USED, RELATED TO CHANGES AND/OR REQUESTS FOR CHANGES.

END OF DOCUMENT

DOCUMENT 01 29 00

**APPLICATION FOR PAYMENT AND
CONDITIONAL AND UNCONDITIONAL WAIVER AND RELEASE FORMS**

**CONTRACTOR SHALL COMPLY WITH ALL PROVISIONS IN THE GENERAL
CONDITIONS RELATED TO APPLICATIONS FOR PAYMENT AND/OR PAYMENTS.**

**CONDITIONAL WAIVER AND RELEASE
ON PROGRESS PAYMENT
(CIVIL CODE SECTION 8132)**

NOTICE: THIS DOCUMENT WAIVES THE CLAIMANT'S LIEN, STOP PAYMENT NOTICE, AND PAYMENT BOND RIGHTS EFFECTIVE ON RECEIPT OF PAYMENT. A PERSON SHOULD NOT RELY ON THIS DOCUMENT UNLESS SATISFIED THAT THE CLAIMANT HAS RECEIVED PAYMENT.

Name of Claimant: _____

Name of Customer: _____

Job Location: _____

Owner: _____

Through Date: _____

Conditional Waiver and Release

This document waives and releases lien, stop payment notice, and payment bond rights the claimant has for labor and service provided, and equipment and material delivered, to the customer on this job through the Through Date of this document. Rights based upon labor or service provided, or equipment or material delivered, pursuant to a written change order that has been fully executed by the parties prior to the date that this document is signed by the claimant, are waived and released by this document, unless listed as an Exception below. This document is effective only on the claimant's receipt of payment from the financial institution on which the following check is drawn:

Maker of Check: _____

Amount of Check: \$_____

Check Payable to: _____

Exceptions

This document does not affect any of the following:

- (1) Retentions.
- (2) Extras for which the claimant has not received payment.
- (3) The following progress payments for which the claimant has previously given a conditional waiver and release but has not received payment:

Date(s) of waiver and release: _____

Amount(s) of unpaid progress payment(s): \$_____

TRACY UNIFIED SCHOOL DISTRICT

**APPLICATION FOR PAYMENT AND
CONDITIONAL AND UNCONDITIONAL
WAIVER AND RELEASE FORMS
DOCUMENT 01 29 00-2**

- (4) Contract rights, including (A) a right based on rescission, abandonment, or breach of contract, and (B) the right to recover compensation for work not compensated by the payment.

Claimant's Signature: _____

Claimant's Title: _____

Date of Signature: _____

**UNCONDITIONAL WAIVER AND RELEASE
ON PROGRESS PAYMENT
(CIVIL CODE SECTION 8134)**

NOTICE TO CLAIMANT: THIS DOCUMENT WAIVES AND RELEASES LIEN, STOP PAYMENT NOTICE, AND PAYMENT BOND RIGHTS UNCONDITIONALLY AND STATES THAT YOU HAVE BEEN PAID FOR GIVING UP THOSE RIGHTS. THIS DOCUMENT IS ENFORCEABLE AGAINST YOU IF YOU SIGN IT, EVEN IF YOU HAVE NOT BEEN PAID. IF YOU HAVE NOT BEEN PAID, USE A CONDITIONAL WAIVER AND RELEASE FORM.

Name of Claimant: _____

Name of Customer: _____

Job Location: _____

Owner: _____

Through Date: _____

Unconditional Waiver and Release

This document waives and releases lien, stop payment notice, and payment bond rights the claimant has for labor and service provided, and equipment and material delivered, to the customer on this job through the Through Date of this document. Rights based upon labor or service provided, or equipment or material delivered, pursuant to a written change order that has been fully executed by the parties prior to the date that this document is signed by the claimant, are waived and released by this document, unless listed as an Exception below. The claimant has received the following progress payment: \$_____

Exceptions

This document does not affect any of the following:

- (1) Retentions.
- (2) Extras for which the claimant has not received payment.
- (3) Contract rights, including (A) a right based on rescission, abandonment, or breach of contract, and (B) the right to recover compensation for work not compensated by the payment.

Claimant's Signature: _____

Claimant's Title: _____

Date of Signature: _____

**CONDITIONAL WAIVER AND RELEASE
ON FINAL PAYMENT**
(CIVIL CODE SECTION 8136)

NOTICE: THIS DOCUMENT WAIVES THE CLAIMANT'S LIEN, STOP PAYMENT NOTICE, AND PAYMENT BOND RIGHTS EFFECTIVE ON RECEIPT OF PAYMENT. A PERSON SHOULD NOT RELY ON THIS DOCUMENT UNLESS SATISFIED THAT THE CLAIMANT HAS RECEIVED PAYMENT.

Name of Claimant: _____

Name of Customer: _____

Job Location: _____

Owner: _____

Conditional Waiver and Release

This document waives and releases lien, stop payment notice, and payment bond rights the claimant has for labor and service provided, and equipment and material delivered, to the customer on this job. Rights based upon labor or service provided, or equipment or material delivered, pursuant to a written change order that has been fully executed by the parties prior to the date that this document is signed by the claimant, are waived and released by this document, unless listed as an Exception below. This document is effective only on the claimant's receipt of payment from the financial institution on which the following check is drawn:

Maker of Check:

Amount of Check: \$_____

Check Payable to: _____

Exceptions

This document does not affect any of the following: _____

Disputed claims for extras in the amount of: \$_____

Claimant's Signature: _____

Claimant's Title: _____

Date of Signature: _____

**UNCONDITIONAL WAIVER AND RELEASE
ON FINAL PAYMENT**
(CIVIL CODE SECTION 8138)

NOTICE TO CLAIMANT: THIS DOCUMENT WAIVES AND RELEASES LIEN, STOP PAYMENT NOTICE, AND PAYMENT BOND RIGHTS UNCONDITIONALLY AND STATES THAT YOU HAVE BEEN PAID FOR GIVING UP THOSE RIGHTS. THIS DOCUMENT IS ENFORCEABLE AGAINST YOU IF YOU SIGN IT, EVEN IF YOU HAVE NOT BEEN PAID. IF YOU HAVE NOT BEEN PAID, USE A CONDITIONAL WAIVER AND RELEASE FORM.

Name of Claimant: _____

Name of Customer: _____

Job Location: _____

Owner: _____

Unconditional Waiver and Release

This document waives and releases lien, stop payment notice, and payment bond rights the claimant has for all labor and service provided, and equipment and material delivered, to the customer on this job. Rights based upon labor or service provided, or equipment or material delivered, pursuant to a written change order that has been fully executed by the parties prior to the date that this document is signed by the claimant, are waived and released by this document, unless listed as an Exception below. The claimant has been paid in full.

Exceptions

This document does not affect any of the following: _____

Disputed claims for extras in the amount of: \$_____

Claimant's Signature: _____

Claimant's Title: _____

Date of Signature: _____

PROJECT MEETINGS

PART 1 – GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions; and
- B. Special Conditions.

1.02 PROGRESS MEETINGS:

- A. Contractor shall schedule and hold regular weekly progress meetings after a minimum of one week's prior written notice of the meeting date and time to all Invitees as indicated below.
- B. Location: Contractor's field office.
- C. The Contractor shall notify and invite the following entities ("Invitees"):
 - (1) District Representative.
 - (2) Contractor.
 - (3) Contractor's Project Manager.
 - (4) Contractor's Superintendent.
 - (5) Subcontractors, as appropriate to the agenda of the meeting.
 - (6) Suppliers, as appropriate to the agenda of the meeting.
 - (7) Construction Manager, if any.
 - (8) Architect
 - (9) Engineer(s), if any and as appropriate to the agenda of the meeting.
 - (10) Others, as appropriate to the agenda of the meeting.
- D. The District's and/or the Architect's Consultants will attend at their discretion, in response to the agenda.
- E. The District representative, the Construction Manager, and/or another District Agent shall take and distribute meeting notes to attendees and other concerned parties. If exceptions are taken to anything in the meeting notes,

those exceptions shall be stated in writing to the District within five (5) working days following District's distribution of the meeting notes.

1.03 PRE-INSTALLATION/PERFORMANCE MEETING:

- A. Contractor shall schedule a meeting prior to the start of each of the demolition work phases. Contractor shall invite all Invitees to this meeting, and others whose work may affect or be affected by the quality of the demolition work.
- B. Contractor shall review in detail prior to this meeting, the manufacturer's requirements and specifications, applicable portions of the Contract Documents, Shop Drawings, and other submittals, and other related work. At this meeting, invitees shall review and resolve conflicts, incompatibilities, or inadequacies discovered or anticipated.
- C. Contractor shall review in detail Project conditions, schedule, requirements for performance, application, installation, and quality of completed Work, and protection of adjacent Work and property.
- D. Contractor shall review in detail means of protecting the completed Work during the remainder of the construction period.

PART 2 - PRODUCTS Not Used.

PART 3 - EXECUTION Not Used.

END OF DOCUMENT

SCHEDULING OF WORK

PART 1 – GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions;
- B. Special Conditions;
- C. Summary of Work; and
- D. Submittals.

1.02 SECTION INCLUDES

- A. Scheduling of Work under this Contract shall be performed by Contractor in accordance with requirements of this Section.
 - (1) Development of schedule, cost and resource loading of the schedule, monthly payment requests, and project status reporting requirements of the Contract shall employ computerized Critical Path Method ("CPM") scheduling ("CPM Schedule").
 - (2) CPM Schedule shall be cost loaded based on Schedule of Values as approved by District.
 - (3) Submit schedules and reports as specified in the General Conditions.
- B. Upon Award of Contract, Contractor shall immediately commence development of Initial and Original CPM Schedules to ensure compliance with CPM Schedule submittal requirements.

1.03 CONSTRUCTION SCHEDULE

- A. Within ten (10) days of issuance of the issuance Notice to Proceed and before request for first progress payment, the Contractor shall prepare and submit to the Project Manager a construction progress schedule conforming to the Milestone Schedule below.
- B. The Construction Schedule shall be continuously updated, and an updated schedule shall be submitted with each application for progress payment. Each revised schedule shall indicate the work actually accomplished during the previous period and the schedule for completion of the remaining work.

C. Milestone Schedule:

ACTIVITY DESCRIPTION

REQUIRED COMPLETION

CONSTRUCTION STARTS

05-26-2022

PHASE 1 DEMOLITION

PHASE 2 DEMOLITION

FINAL PROJECT COMPLETION

1.04 QUALIFICATIONS

- A. Contractor shall employ experienced scheduling personnel qualified to use the latest version of [i.e., Primavera Project Planner]. Experience level required is set forth below. Contractor may employ such personnel directly or may employ a consultant for this purpose.
- (1) The written statement shall identify the individual who will perform CPM scheduling.
 - (2) Capability and experience shall be verified by description of construction projects on which individual has successfully applied computerized CPM.
 - (3) Required level of experience shall include at least two (2) projects of similar nature and scope with value not less than three fourths ($\frac{3}{4}$) of the Total Bid Price of this Project. The written statement shall provide contact persons for referenced projects with current telephone and address information.
- B. District reserves the right to approve or reject Contractor's scheduler or consultant at any time. District reserves the right to refuse replacing of Contractor's scheduler or consultant, if District believes replacement will negatively affect the scheduling of Work under this Contract.

1.05 GENERAL

- A. Progress Schedule shall be based on and incorporate milestone and completion dates specified in Contract Documents.
- B. Overall time of completion and time of completion for each milestone shown on Progress Schedule shall adhere to times in the Contract, unless an earlier (advanced) time of completion is requested by Contractor and agreed to by District. Any such agreement shall be formalized by a Change Order.
- (1) District is not required to accept an early completion schedule, i.e., one that shows an earlier completion date than the Contract Time.
 - (2) Contractor shall not be entitled to extra compensation in event agreement is reached on an earlier completion schedule and Contractor completes its Work, for whatever reason, beyond completion date shown in its early completion schedule but within the Contract Time.

- (3) A schedule showing the work completed in less than the Contract Time, and that has been accepted by District, shall be considered to have Project Float. The Project Float is the time between the scheduled completion of the work and the Completion Date. Project Float is a resource available to both District and the Contractor.
- C. Ownership Project Float: Neither the District nor Contractor owns Project Float. The Project owns the Project Float. As such, liability for delay of the Completion Date rests with the party whose actions, last in time, actually cause delay to the Completion Date.
 - (1) For example, if Party A uses some, but not all of the Project Float and Party B later uses remainder of the Project Float as well as additional time beyond the Project Float, Party B shall be liable for the time that represents a delay to the Completion Date.
 - (2) Party A would not be responsible for the time since it did not consume the entire Project Float and additional Project Float remained; therefore, the Completion Date was unaffected by Party A.
- D. Progress Schedule shall be the basis for evaluating job progress, payment requests, and time extension requests. Responsibility for developing Contract CPM Schedule and monitoring actual progress as compared to Progress Schedule rests with Contractor.
- E. Failure of Progress Schedule to include any element of the Work, or any inaccuracy in Progress Schedule, will not relieve Contractor from responsibility for accomplishing the Work in accordance with the Contract. District's acceptance of schedule shall be for its use in monitoring and evaluating job progress, payment requests, and time extension requests and shall not, in any manner, impose a duty of care upon District, or act to relieve Contractor of its responsibility for means and methods of construction.
- F. Software: Use [i.e, District Project Planner for Windows, latest version]. Such software shall be compatible with Windows operating system. Contractor shall transmit contract file to District on compact disk at times requested by District.
- G. Transmit each item under the form approved by District.
 - (1) Identify Project with District Contract number and name of Contractor.
 - (2) Provide space for Contractor's approval stamp and District's review stamps.
 - (3) Submittals received from sources other than Contractor will be returned to the Contractor without District's review.

1.06 INITIAL CPM SCHEDULE

- A. Initial CPM Schedule submitted for review at the pre-construction conference shall serve as Contractor's schedule for up to ninety (90) calendar days after the Notice to Proceed.

- B. Indicate detailed plan for the Work to be completed in first ninety (90) days of the Contract; details of planned mobilization of plant and equipment; sequence of early operations; procurement of materials and equipment. Show Work beyond ninety (90) calendar days in summary form.
- C. Initial CPM Schedule shall be time scaled.
- D. Initial CPM Schedule shall be cost and resource loaded. Accepted cost and resource loaded schedule will be used as basis for monthly progress payments until acceptance of the Original CPM Schedule. Use of Initial CPM Schedule for progress payments shall not exceed ninety (90) calendar days.
- E. District and Contractor shall meet to review and discuss the Initial CPM Schedule within seven (7) calendar days after it has been submitted to District.
 - (1) District's review and comment on the schedule shall be limited to Contract conformance (with sequencing, coordination, and milestone requirements).
 - (2) Contractor shall make corrections to schedule necessary to comply with Contract requirements and shall adjust schedule to incorporate any missing information requested by District. Contractor shall resubmit Initial CPM Schedule if requested by District.
- F. If, during the first ninety (90) days after Notice to Proceed, the Contractor is of the opinion that any of the Work included on its Initial CPM Schedule has been impacted, the Contractor shall submit to District a written Time Impact Evaluation ("TIE") in accordance with Article 1.12 of this Section. The TIE shall be based on the most current update of the Initial CPM Schedule.

1.07 ORIGINAL CPM SCHEDULE

- A. Submit a detailed proposed Original CPM Schedule presenting an orderly and realistic plan for completion of the Work in conformance with requirements as specified herein.
- B. Progress Schedule shall include or comply with following requirements:
 - (1) Time scaled, cost and resource (labor and major equipment) loaded CPM schedule.
 - (2) No activity on schedule shall have duration longer than fifteen (15) work days, with exception of submittal, approval, fabrication and procurement activities, unless otherwise approved by District.
 - (a) Activity durations shall be total number of actual work days required to perform that activity.
 - (3) The start and completion dates of all items of Work, their major components, and milestone completion dates, if any.

- (4) District furnished materials and equipment, if any, identified as separate activities.
- (5) Activities for maintaining Project Record Documents.
- (6) Dependencies (or relationships) between activities.
- (7) Processing/approval of submittals and shop drawings for all material and equipment required per the Contract. Activities that are dependent on submittal acceptance or material delivery shall not be scheduled to start earlier than expected acceptance or delivery dates.
 - (a) Include time for submittals, re-submittals and reviews by District. Coordinate with accepted schedule for submission of Shop Drawings, samples, and other submittals.
 - (b) Contractor shall be responsible for all impacts resulting from re-submittal of Shop Drawings and submittals.
- (8) Procurement of major equipment, through receipt and inspection at jobsite, identified as separate activity.
 - (a) Include time for fabrication and delivery of manufactured products for the Work.
 - (b) Show dependencies between procurement and construction.
- (9) Activity description; what Work is to be accomplished and where.
- (10) The total cost of performing each activity shall be total of labor, material, and equipment, excluding overhead and profit of Contractor. Overhead and profit of the General Contractor shall be shown as a separate activity in the schedule. Sum of cost for all activities shall equal total Contract value.
- (11) Resources required (labor and major equipment) to perform each activity.
- (12) Responsibility code for each activity corresponding to Contractor or Subcontractor responsible for performing the Work.
- (13) Identify the activities which constitute the controlling operations or critical path. No more than twenty-five (25%) of the activities shall be critical or near critical. Near critical is defined as float in the range of one (1) to (10) days.
- (14) Twenty (20) workdays for developing punch list(s), completion of punch-list items, and final clean up for the Work or any designated portion thereof. No other activities shall be scheduled during this period.
- (15) Interface with the work of other contractors, District, and agencies such as, but not limited to, utility companies.

- (16) Show detailed Subcontractor Work activities. In addition, furnish copies of Subcontractor schedules upon which CPM was built.
 - (a) Also furnish for each Subcontractor, as determined by District, submitted on Subcontractor letterhead, a statement certifying that Subcontractor concurs with Contractor's Original CPM Schedule and that Subcontractor's related schedules have been incorporated, including activity duration, cost and resource loading.
 - (b) Subcontractor schedules shall be independently derived and not a copy of Contractor's schedule.
 - (c) In addition to Contractor's schedule and resource loading, obtain from electrical, mechanical, and plumbing Subcontractors, and other Subcontractors as required by District, productivity calculations common to their trades, such as units per person day, feet of pipe per day per person, feet of wiring per day per person, and similar information.
 - (d) Furnish schedule for Contractor/Subcontractor CPM schedule meetings which shall be held prior to submission of Original CPM schedule to District. District shall be permitted to attend scheduled meetings as an observer.
- (17) Activity durations shall be in Work days.
- (18) Submit with the schedule a list of anticipated non-Work days, such as weekends and holidays. The Progress Schedule shall exclude in its Work day calendar all non-Work days on which Contractor anticipates critical Work will not be performed.
- C. Original CPM Schedule Review Meeting: Contractor shall, within sixty (60) days from the Notice to Proceed date, meet with District to review the Original CPM Schedule submittal.
 - (1) Contractor shall have its Project Manager, Project Superintendent, Project Scheduler, and key Subcontractor representatives, as required by District, in attendance. The meeting will take place over a continuous one (1) day period.
 - (2) District's review will be limited to submittal's conformance to Contract requirements including, but not limited to, coordination requirements. However, review may also include:
 - (a) Clarifications of Contract Requirements.
 - (b) Directions to include activities and information missing from submittal.
 - (c) Requests to Contractor to clarify its schedule.

- (3) Within five (5) days of the Schedule Review Meeting, Contractor shall respond in writing to all questions and comments expressed by District at the Meeting.

1.08 ADJUSTMENTS TO CPM SCHEDULE

- A. Adjustments to Original CPM Schedule: Contractor shall have adjusted the Original CPM Schedule submittal to address all review comments from original CPM Schedule review meeting and resubmit network diagrams and reports for District's review.
 - (1) District, within ten (10) days from date that Contractor submitted the revised schedule, will either:
 - (a) Accept schedule and cost and resource loaded activities as submitted, or
 - (b) Advise Contractor in writing to review any part or parts of schedule which either do not meet Contract requirements or are unsatisfactory for District to monitor Project's progress, resources, and status or evaluate monthly payment request by Contractor.
 - (2) District may accept schedule with conditions that the first monthly CPM Schedule update be revised to correct deficiencies identified.
 - (3) When schedule is accepted, it shall be considered the "Original CPM Schedule" which will then be immediately updated to reflect the current status of the work.
 - (4) District reserves right to require Contractor to adjust, add to, or clarify any portion of schedule which may later be discovered to be insufficient for monitoring of Work or approval of partial payment requests. No additional compensation will be provided for such adjustments, additions, or clarifications.
- B. Acceptance of Contractor's schedule by District will be based solely upon schedule's compliance with Contract requirements.
 - (1) By way of Contractor assigning activity durations and proposing sequence of Work, Contractor agrees to utilize sufficient and necessary management and other resources to perform work in accordance with the schedule.
 - (2) Upon submittal of schedule update, updated schedule shall be considered "current" CPM Schedule.
 - (3) Submission of Contractor's schedule to District shall not relieve Contractor of total responsibility for scheduling, sequencing, and pursuing Work to comply with requirements of Contract Documents, including adverse effects such as delays resulting from ill-timed Work.

- C. Submittal of Original CPM Schedule, and subsequent schedule updates, shall be understood to be Contractor's representation that the Schedule meets requirements of Contract Documents and that Work shall be executed in sequence indicated on the schedule.
- D. Contractor shall distribute Original CPM Schedule to Subcontractors for review and written acceptance, which shall be noted on Subcontractors' letterheads to Contractor and transmitted to District for the record.

1.09 MONTHLY CPM SCHEDULE UPDATE SUBMITTALS

- A. Following acceptance of Contractor's Original CPM Schedule, Contractor shall monitor progress of Work and adjust schedule each month to reflect actual progress and any anticipated changes to planned activities.
 - (1) Each schedule update submitted shall be complete, including all information requested for the Original CPM Schedule submittal.
 - (2) Each update shall continue to show all Work activities including those already completed. These completed activities shall accurately reflect "as built" information by indicating when activities were actually started and completed.
- B. A meeting will be held on approximately the twenty-fifth (25th) of each month to review the schedule update submittal and progress payment application.
 - (1) At this meeting, at a minimum, the following items will be reviewed: Percent (%) complete of each activity; Time Impact Evaluations for Change Orders and Time Extension Request; actual and anticipated activity sequence changes; actual and anticipated duration changes; and actual and anticipated Contractor delays.
 - (2) These meetings are considered a critical component of overall monthly schedule update submittal and Contractor shall have appropriate personnel attend. At a minimum, these meetings shall be attended by Contractor's General Superintendent and Scheduler.
 - (3) Contractor shall plan on the meeting taking no less than four (4) hours.
- C. Within five (5) working days after monthly schedule update meeting, Contractor shall submit the updated CPM Schedule update.
- D. Within five (5) work days of receipt of above noted revised submittals, District will either accept or reject monthly schedule update submittal.
 - (1) If accepted, percent (%) complete shown in monthly update will be basis for Application for Payment by the Contractor. The schedule update shall be submitted as part of the Contractor's Application for Payment.

- (2) If rejected, update shall be corrected and resubmitted by Contractor before the Application for Payment is submitted.
- E. Neither updating, changing or revising of any report, curve, schedule, or narrative submitted to District by Contractor under this Contract, nor District's review or acceptance of any such report, curve, schedule or narrative shall have the effect of amending or modifying in any way the Completion Date or milestone dates or of modifying or limiting in any way Contractor's obligations under this Contract.

1.10 SCHEDULE REVISIONS

- A. Updating the Schedule to reflect actual progress shall not be considered revisions to the Schedule. Since scheduling is a dynamic process, revisions to activity durations and sequences are expected on a monthly basis.
- B. To reflect revisions to the Schedule, the Contractor shall provide District with a written narrative with a full description and reasons for each Work activity revised. For revisions affecting the sequence of work, the Contractor shall provide a schedule diagram which compares the original sequence to the revised sequence of work. The Contractor shall provide the written narrative and schedule diagram for revisions two (2) working days in advance of the monthly schedule update meeting.
- C. Schedule revisions shall not be incorporated into any schedule update until the revisions have been reviewed by District. District may request further information and justification for schedule revisions and Contractor shall, within three (3) days, provide District with a complete written narrative response to District's request.
- D. If the Contractor's revision is still not accepted by District, and the Contractor disagrees with District's position, the Contractor has seven (7) calendar days from receipt of District's letter rejecting the revision to provide a written narrative providing full justification and explanation for the revision. The Contractor's failure to respond in writing within seven (7) calendar days of District's written rejection of a schedule revision shall be contractually interpreted as acceptance of District's position, and the Contractor waives its rights to subsequently dispute or file a claim regarding District's position.
- E. At District's discretion, the Contractor can be required to provide Subcontractor certifications of performance regarding proposed schedule revisions affecting said Subcontractors.

1.11 RECOVERY SCHEDULE

- A. If the Schedule Update shows a completion date twenty-one (21) calendar days beyond the Contract Completion Date, or individual milestone completion dates, the Contractor shall submit to District the proposed revisions to recover the lost time within seven (7) calendar days. As part of this submittal, the Contractor shall provide a written narrative for each revision made to recapture the lost time. If the revisions include sequence changes, the Contractor shall provide a schedule diagram comparing the original sequence to the revised sequence of work.

- B. The revisions shall not be incorporated into any schedule update until the revisions have been reviewed by District.
- C. If the Contractor's revisions are not accepted by District, District and the Contractor shall follow the procedures in paragraph 1.09.C, 1.09.D and 1.09.E above.
- D. At District's discretion, the Contractor can be required to provide Subcontractor certifications for revisions affecting said Subcontractors.

1.12 TIME IMPACT EVALUATION ("TIE") FOR CHANGE ORDERS, AND OTHER DELAYS

- A. When Contractor is directed to proceed with changed Work, the Contractor shall prepare and submit within fourteen (14) calendar days from the Notice to Proceed a TIE which includes both a written narrative and a schedule diagram depicting how the changed Work affects other schedule activities. The schedule diagram shall show how the Contractor proposes to incorporate the changed Work in the schedule and how it impacts the current schedule-update critical path. The Contractor is also responsible for requesting time extensions based on the TIE's impact on the critical path. The diagram must be tied to the main sequence of schedule activities to enable District to evaluate the impact of changed Work to the scheduled critical path.
- B. Contractor shall be required to comply with the requirements of Paragraph 1.09.A for all types of delays such as, but not limited to, Contractor/Subcontractor delays, adverse weather delays, strikes, procurement delays, fabrication delays, etc.
- C. Contractor shall be responsible for all costs associated with the preparation of TIEs, and the process of incorporating them into the current schedule update. The Contractor shall provide District with four (4) copies of each TIE.
- D. Once agreement has been reached on a TIE, the Contract Time will be adjusted accordingly. If agreement is not reached on a TIE, the Contract Time may be extended in an amount District allows, and the Contractor may submit a claim for additional time claimed by contractor.

1.13 TIME EXTENSIONS

- A. The Contractor is responsible for requesting time extensions for time impacts that, in the opinion of the Contractor, impact the critical path of the current schedule update. Notice of time impacts shall be given in accord with the General Conditions.
- B. Where an event for which District is responsible impacts the projected Completion Date, the Contractor shall provide a written mitigation plan, including a schedule diagram, which explains how (e.g., increase crew size, overtime, etc.) the impact can be mitigated. The Contractor shall also include a detailed cost breakdown of the labor, equipment, and material the Contractor would expend to mitigate District-caused time impact. The Contractor shall submit its mitigation plan to District within fourteen (14)

calendar days from the date of discovery of the impact. The Contractor is responsible for the cost to prepare the mitigation plan.

- C. Failure to request time, provide TIE, or provide the required mitigation plan will result in Contractor waiving its right to a time extension and cost to mitigate the delay.
- D. No time will be granted under this Contract for cumulative effect of changes.
- E. District will not be obligated to consider any time extension request unless the Contractor complies with the requirements of Contract Documents.
- F. Failure of the Contractor to perform in accordance with the current schedule update shall not be excused by submittal of time extension requests.
- G. If the Contractor does not submit a TIE within the required fourteen (14) calendar days for any issue, it is mutually agreed that the Contractor does not require a time extension for said issue.

1.14 SCHEDULE REPORTS

- A. Submit four (4) copies of the following reports with the Initial CPM Schedule, the Original CPM Schedule, and each monthly update.
- B. Required Reports:
 - (1) Two activity listing reports: one sorted by activity number and one by total Project Float. These reports shall also include each activity's early/late and actual start and finish dates, original and remaining duration, Project Float, responsibility code, and the logic relationship of activities.
 - (2) Cost report sorted by activity number including each activity's associated cost, percentage of Work accomplished, earned value- to date, previous payments, and amount earned for current update period.
 - (3) Schedule plots presenting time-scaled network diagram showing activities and their relationships with the controlling operations or critical path clearly highlighted.
 - (4) Cash flow report calculated by early start, late start, and indicating actual progress. Provide an exhibit depicting this information in graphic form.
 - (5) Planned versus actual resource (i.e., labor) histogram calculated by early start and late start.
- C. Other Reports:

In addition to above reports, District may request, from month to month, any two of the following reports. Submit four (4) copies of all reports.

- (1) Activities by early start.
 - (2) Activities by late start.
 - (3) Activities grouped by Subcontractors or selected trades.
 - (4) Activities with scheduled early start dates in a given time frame, such as fifteen (15) or thirty (30) day outlook.
- D. Furnish District with report files on compact disks containing all schedule files for each report generated.

1.15 PROJECT STATUS REPORTING

- A. In addition to submittal requirements for CPM scheduling identified in this Section, Contractor shall provide a monthly project status report (i.e., written narrative report) to be submitted in conjunction with each CPM Schedule as specified herein. Status reporting shall be in form specified below.
- B. Contractor shall prepare monthly written narrative reports of status of Project for submission to District. Written status reports shall include:
- (1) Status of major Project components (percent (%) complete, amount of time ahead or behind schedule) and an explanation of how Project will be brought back on schedule if delays have occurred.
 - (2) Progress made on critical activities indicated on CPM Schedule.
 - (3) Explanations for any lack of work on critical path activities planned to be performed during last month.
 - (4) Explanations for any schedule changes, including changes to logic or to activity durations.
 - (5) List of critical activities scheduled to be performed next month.
 - (6) Status of major material and equipment procurement.
 - (7) Any delays encountered during reporting period.
 - (8) Contractor shall provide printed report indicating actual versus planned resource loading for each trade and each activity. This report shall be provided on weekly and monthly basis.
 - (a) Actual resource shall be accumulated in field by Contractor, and shall be as noted on Contractor's daily reports. These reports will be basis for information provided in computer-generated monthly and weekly printed reports.
 - (b) Contractor shall explain all variances and mitigation measures.

- (9) Contractor may include any other information pertinent to status of Project. Contractor shall include additional status information requested by District at no additional cost.
- (10) Status reports, and the information contained therein, shall not be construed as claims, notice of claims, notice of delay, or requests for changes or compensation.

1.16 WEEKLY SCHEDULE REPORT

At the Weekly Progress Meeting, the Contractor shall provide and present a time-scaled three (3) week look-ahead schedule that is based and correlated by activity number to the current schedule (i.e., Initial, Original CPM, or Schedule Update).

1.17 DAILY CONSTRUCTION REPORTS

On a daily basis, Contractor shall submit a daily activity report to District for each workday, including weekends and holidays when worked. Contractor shall develop the daily construction reports on a computer-generated database capable of sorting daily Work, manpower, and man-hours by Contractor, Subcontractor, area, sub-area, and Change Order Work. Upon request of District, furnish computer disk of this data base. Obtain District's written approval of daily construction report data base format prior to implementation. Include in report:

- A. Project name and Project number.
- B. Contractor's name and address.
- C. Weather, temperature, and any unusual site conditions.
- D. Brief description and location of the day's scheduled activities and any special problems and accidents, including Work of Subcontractors. Descriptions shall be referenced to CPM scheduled activities.
- E. Worker quantities for its own Work force and for Subcontractors of any tier.
- F. Equipment, other than hand tools, utilized by Contractor and Subcontractors.

1.18 PERIODIC VERIFIED REPORTS

Contractor shall complete and verify construction reports on a form prescribed by the Division of the State Architect and file reports on the first day of February, May, August, and November during the preceding quarter year; at the completion of the Contract; at the completion of the Work; at the suspension of Work for a period of more than one (1) month; whenever the services of Contractor or any of Contractor's Subcontractors are terminated for any reason; and at any time a special verified report is required by the Division of the State Architect. Refer to section 4-336 and section 4-343 of Part 1, Title 24 of the California Code of Regulations.

PART 2 – PRODUCTS Not Used.

PART 3 - EXECUTION Not Used.

END OF DOCUMENT

SUBMITTALS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Contractor's Submittals and Schedules, Drawings and Specifications;
- B. Special Conditions.

1.02 SECTION INCLUDES:

- A. Definitions:
 - (1) Shop Drawings and Product Data are as indicated in the General Conditions and include, but are not limited to, fabrication, erection, layout and setting drawings, formwork and falsework drawings, manufacturers' standard drawings, descriptive literature, catalogues, brochures, performance and test data, wiring and control diagrams. In addition, there are other drawings and descriptive data pertaining to materials, equipment, piping, duct and conduit systems, and methods of construction as may be required to show that the materials, equipment or systems and all positions conform to the requirement of the Contract Documents, including, without limitation, the Drawings.
 - (2) "Manufactured" applies to standard units usually mass-produced; "fabricated" means specifically assembled or made out of selected materials to meet design requirements. Shop Drawings shall establish the actual detail of manufactured or fabricated items, indicated proper relation to adjoining work and amplify design details of mechanical and electrical equipment in proper relation to physical spaces in the structure.
 - (3) Manufacturer's Instructions: Where any item of Work is required by the Contract Documents to be furnished, installed, or performed, at a minimum, in accordance with a specified product manufacturer's instructions, the Contractor shall procure and distribute copies of these to the District, the Architect, and all other concerned parties and shall furnish, install, or perform the work, at a minimum, in accordance with those instructions.
- B. Samples, Shop Drawings, Product Data, and other items as specified, in accordance with the following requirements:
 - (1) Contractor shall submit all Shop Drawings, Product Data, and Samples to the District, the Architect, the Project Inspector, and the Construction Manager.

Contractor to review section
01 3300 as well as this
document

- (2) Contractor shall comply with all time frames herein and in the General Conditions and, in any case, shall submit required information in sufficient time to permit proper consideration and action before ordering any materials or items represented by such Shop Drawings, Product Data, and/or Samples.
- (3) Contractor shall allow sufficient time so that no delay occurs due to required lead time in ordering or delivery of any item to the Site. Contractor shall be responsible for any delay in progress of Work due to its failure to observe these requirements.
- (4) Time for completion of Work shall not be extended on account of Contractor's failure to promptly submit Shop Drawings, Product Data, and/or Samples.
- (5) Reference numbers on Shop Drawings shall have Architectural and/or Engineering Contract Drawings reference numbers for details, sections, and "cuts" shown on Shop Drawings. These reference numbers shall be in addition to any numbering system that Contractor chooses to use or has adopted as standard.
- (6) When the magnitude or complexity of submittal material prevents a complete review within the stated time frame, Contractor shall make this submittal in increments to avoid extended delays.
- (7) Contractor shall certify on submittals for review that submittals conform to Contract requirements. Also certify that Contractor-furnished equipment can be installed in allocated space. In event of any variance, Contractor shall specifically state in transmittal and on Shop Drawings, portions vary and require approval of a substitute. Submittals shall not be used as a means of requesting a substitution.
- (8) Unless specified otherwise, sampling, preparation of samples, and tests shall be in accordance with the latest standard of the American Society for Testing and Materials.
- (9) Upon demand by Architect or District, Contractor shall submit samples of materials and/or articles for tests or examinations and consideration before Contractor incorporates same in Work. Contractor shall be solely responsible for delays due to sample(s) not being submitted in time to allow for tests. Acceptance or rejection will be expressed in writing. Work shall be equal to approved samples in every respect. Samples that are of value after testing will remain the property of Contractor.

C. Submittal Schedule:

- (1) Contractor shall prepare its proposed submittal schedule that is coordinated with the proposed construction schedule and submit both to the District within ten (10) days after the date of the Notice to Proceed. Contractor's proposed schedules shall become the Project Construction Schedule and the Project Submittal Schedule after each is approved by the District.

Contractor to review section
01 3300 as well as this
document

- (2) Contractor is responsible for all lost time should the initial submittal be rejected, marked "revise and resubmit", etc.
- (3) All Submittals shall be forwarded to the District by the date indicated on the approved Submittal Schedule, unless an earlier date is necessary to maintain the Construction Schedule, in which case those Submittals shall be forwarded to the District so as not to delay the Construction Schedule.
- (4) Contractor may be assessed \$100 a day for each day it is late in submitting a shop drawing or sample. No extensions of time will be granted to Trade Contractor or any Subcontractor because of its failure to have shop drawings and samples submitted in accordance with the Schedule.

1.03 SHOP DRAWINGS:

- A. Contractor shall submit one reproducible transparency and six (6) opaque reproductions. The District will review and return the reproducible copy and one (1) opaque reproduction to Contractor.
- B. Before commencing installation of any Work, the Contractor shall submit and receive approval of all drawings, descriptive data, and material list(s) as required to accomplish Work.
- C. Review of Shop Drawings is regarded as a service to assist Contractor and in all cases original Contract Documents shall take precedence as outlined under General Conditions.
- D. No claim for extra time or payment shall be based on work shown on Shop Drawings unless the claim is (1) noted on Contractor's transmittal letter accompanying Shop Drawings and (2) Contractor has complied with all applicable provisions of the General Conditions, including, without limitation, provisions regarding changes and payment, and all required written approvals.
- E. District shall not review Shop Drawings for quantities of materials or number of items supplied.
- F. District's and/or Architect's review of Shop Drawing will be general. District and/or Architect review does not relieve Contractor of responsibility for dimensions, accuracy, proper fitting, construction of Work, furnishing of materials, or Work required by Contract Documents and not indicated on Shop Drawings. The District's and/or Architect's review of Shop Drawings is not to be construed as approving departures from Contract Documents.
- G. Review of Shop Drawings and Schedules does not relieve Contractor from responsibility for any aspect of those Drawings or Schedules that is a violation of local, County, State, or Federal laws, rules, ordinances, or rules and regulations of commissions, boards, or other authorities or utilities having jurisdiction.
- H. Before submitting Shop Drawings for review, Contractor shall check Shop Drawings of its subcontractors for accuracy, and confirm that all Work

Contractor to review section
01 3300 as well as this
document

contiguous with and having bearing on other work shown on Shop Drawings is accurately drawn and in conformance with Contract Documents.

- I. Submitted drawings and details must bear stamp of approval of Contractor:
 - (1) Stamp and signature shall clearly certify that Contractor has checked Shop Drawings for compliance with Drawings.
 - (2) If Contractor submits a Shop Drawing without an executed stamp of approval, or whenever it is evident (despite stamp) that Drawings have not been checked, the District and/or Architect will not consider them and will return them to the Contractor for revision and resubmission. In that event, it will be deemed that Contractor has not complied with this provision and Contractor shall bear risk of all delays to same extent as if it had not submitted any Shop Drawings or details.
- J. Submission of Shop Drawings (in either original submission or when resubmitted with correction) constitutes evidence that Contractor has checked all information thereon and that it accepts and is willing to perform Work as shown.
- K. Contractor shall pay for cost of any changes in construction due to improper checking and coordination. Contractor shall be responsible for all additional costs, including coordination. Contractor shall be responsible for costs incurred by itself, the District, the Architect, the Project Inspector, the Construction Manager, any other Subcontractor or contractor, etc., due to improperly checked and/or coordination of submittals.
- L. Shop Drawings must clearly delineate the following information:
 - (1) Project name and address.
 - (2) Specification number and description.
 - (3) Architect's name and project number.
 - (4) Shop Drawing title, number, date, and scale.
 - (5) Names of Contractor, Subcontractor(s) and fabricator.
 - (6) Working and erection dimensions.
 - (7) Arrangements and sectional views.
 - (8) Necessary details, including complete information for making connections with other Work.
 - (9) Kinds of materials and finishes.
 - (10) Descriptive names of materials and equipment, classified item numbers, and locations at which materials or equipment are to be installed in the Work. Contractor shall use same reference identification(s) as shown on Contract Drawings.

Contractor to review section
01 3300 as well as this
document

- M. Contractor shall prepare composite drawings and installation layouts when required to solve tight field conditions.
 - (1) Shop Drawings shall consist of dimensioned plans and elevations and must give complete information, particularly as to size and location of sleeves, inserts, attachments, openings, conduits, ducts, boxes, structural interferences, etc.
 - (2) Contractor shall coordinate these composite Shop Drawings and installation layouts in the field between itself and its Subcontractor(s) for proper relationship to the Work, the work of other trades, and the field conditions. The Contractor shall check and approve all submittal(s) before submitting them for final review.

1.04 PRODUCT DATA OR NON REPRODUCIBLE SUBMITTALS:

- A. Contractor shall submit manufacturer's printed literature in original form. Any fading type of reproduction will not be accepted. Contractor must submit a minimum of six (6) each, to the District. District shall return one (1) to the Contractor, who shall reproduce whatever additional copies it requires for distribution.
- B. Contractor shall submit six (6) copies of a complete list of all major items of mechanical, plumbing, and electrical equipment and materials in accordance with the approved Submittal Schedule, except as required earlier to comply with the approved Construction Schedule. Other items specified are to be submitted prior to commencing Work. Contractor shall submit items of like kind at one time in a neat and orderly manner. Partial lists will not be acceptable.
- C. Submittals shall include manufacturer's specifications, physical dimensions, and ratings of all equipment. Contractor shall furnish performance curves for all pumps and fans. Where printed literature describes items in addition to that item being submitted, submitted item shall be clearly marked on sheet and superfluous information shall be crossed out. If highlighting is used, Contractor shall mark all copies.
- D. Equipment submittals shall be complete and include space requirements, weight, electrical and mechanical requirements, performance data, and supplemental information that may be requested.
- E. Imported Materials Certification must be submitted at least ten (10) days before material is delivered.

1.05 SAMPLES:

- A. Contractor shall submit for approval Samples as required and within the time frame in the Contract Documents. Materials such as concrete, mortar, etc., which require on-site testing will be obtained from Project Site.
- B. Contractor shall submit four (4) samples except where greater or lesser number is specifically required by Contract Documents including, without limitation, the Specifications.

Contractor to review section
01 3300 as well as this
document

- (1) Samples must be of sufficient size and quality to clearly illustrate functional characteristics, with integrally related parts and attachment devices.
 - (2) Samples must show full range of texture, color, and pattern.
- C. Contractor shall make all Submittals, unless it has authorized Subcontractor(s) to submit and Contractor has notified the District in writing to this effect.
- D. Samples to be shipped prepaid or hand-delivered to the District.
- E. Contractor shall mark samples to show name of Project, name of Contractor submitting, Contract number and segment of Work where representative Sample will be used, all applicable Specifications Sections and documents, Contract Drawing Number and detail, and ASTM or FS reference, if applicable.
- F. Contractor shall not deliver any material to Site prior to receipt of District's and/or Architect's completed written review and approval. Contractor shall furnish materials equal in every respect to approved Samples and execute Work in conformance therewith.
- G. District's and/or Architect's review, acceptance, and/or approval of Sample(s) will not preclude rejections of any material upon discovery of defects in same prior to final acceptance of completed Work.
- H. After a material has been approved, no change in brand or make will be permitted.
- I. Contractor shall prepare its Submittal Schedule and submit Samples of materials requiring laboratory tests to specified laboratory for testing not less than ninety (90) days before such materials are required to be used in Work.
- J. Samples which are rejected must be resubmitted promptly after notification of rejection and be marked "Resubmitted Sample" in addition to other information required.
- K. Field Samples and Mock-Ups are to be removed by Contractor at District's direction:
 - (1) Size: As Specified.
 - (2) Furnish catalog numbers and similar data, as requested.

1.06 REVIEW AND RESUBMISSION REQUIREMENTS:

- A. The District will arrange for review of Sample(s), Shop Drawing(s), Product Data, and other submittal(s) by appropriate reviewer and return to Contractor as provided below within twenty-one (21) days after receipt or within twenty-one (21) days after receipt of all related information necessary for such review, whichever is later.
- B. One (1) copy of product or materials data will be returned to Contractor with the review status.

Contractor to review section
01 3300 as well as this
document

- C. Samples to be incorporated into the Work will be returned to Contractor, together with a written notice designating the Sample with the appropriate review status and indicating errors discovered on review, if any. Other Samples will not be returned, but the same notice will be given with respect thereto, and that notice shall be considered a return of the Sample.
- D. Contractor shall revise and resubmit any Sample(s), Shop Drawing(s), Product Data, and other submittal(s) as required by the reviewer. Such resubmittals will be reviewed and returned in the same manner as original Sample(s), Shop Drawing(s), Product Data, and other submittal(s), within fourteen (14) days after receipt thereof or within fourteen (14) days after receipt of all related information necessary for such review. Such resubmittal shall not delay the Work.
- E. Contractor may proceed with any of the Work covered by Sample(s), Shop Drawing(s), Product Data, and other submittal(s) upon its return if designated as no exception taken, or revise as noted, provided the Contractor proceeds in accordance with the District and/or the Architect's notes and comments.
- F. Contractor shall not begin any of the work covered by a Sample(s), Shop Drawing(s), Product Data, and other submittal(s), designated as revise and resubmit or rejected, until a revision or correction thereof has been reviewed and returned to Contractor.
- G. Sample(s), Shop Drawing(s), Product Data, and other submittal(s) designated as revise and resubmit or rejected and requiring resubmittal, shall be revised or corrected and resubmitted to the District no later than fourteen (14) days or a shorter period as required to comply with the approved Construction Schedule, after its return to Contractor.
- H. Neither the review nor the lack of review of any Sample(s), Shop Drawing(s), Product Data, and other submittal(s) shall waive any of the requirements of the Contract Documents, or relieve Contractor of any obligation thereunder.
- I. District's and/or Architect's review of Shop Drawings does not relieve the Contractor of responsibility for any errors that may exist. Contractor is responsible for the dimensions and design of adequate connections and details and for satisfactory construction of all the Work.

PART 2 – PRODUCTS Not Used.

PART 3 - EXECUTION Not Used.

END OF DOCUMENT

Louis Bohn E.S. TK Portable Classroom Building
Tracy Unified School District

SUBMITTAL NO.:

Architect's Project # 3595001
DSA File/Apl. # 39-73/122127

DATE: _____
Re-Submittal of Original No.: _____

1. SUBMITTAL TRANSMITTAL

Attention: Affifa Kadhim

Contractor: Company

Contact: Name _____

Sub Contractor:

Contact: _____



Please submit only one trade per submittal! Description of submitted materials:

Quantity submitted	Specification Section		Description of contents (e.g. product data, shop drawings, samples)
	Section #	Section Title	

Contractor Statement: (read and acknowledge)

This submittal has been reviewed and approved with respect to the means, methods, techniques, and procedures of construction, safety precautions, and program incidentals thereto. This submittal complies with the contract documents and comprises no variations thereto, unless accompanied by a substitution request.

By: _____
Name

Date: _____

2. RE-TRANSMITTAL TO CONTRACTOR:

Distribution: Contractor, Owner, Project Inspector, RGA, Other

- ☐ NO EXCEPTIONS TAKEN
☐ SUBMIT SPECIFIED ITEM

- ☐ REJECTED
☐ REVISE AND RESUBMIT

- ☐ FURNISH AS CORRECTED
☐ NO ACTION REQUIRED

Corrections or comments made on the shop drawings during this review do not relieve the Contractor from compliance with requirements of the Drawings and Specifications. This general check is only for the review of conformance with the design concept of the project and general compliance with the information given in the Contract Documents. The Contractor is responsible for confirming and correlating all quantities and dimensions, selecting fabrication processes and techniques of construction, coordinating his work with that of all the other trades, and performing his work in a safe and satisfactory manner.

Rainforth Grau Architects

By: _____ Date: _____

Additional Comments:

See Specification Section 01 3300 for use of this form

Louis Bohn E.S. TK Portable Classroom Building
Tracy Unified School District

**SUBSTITUTION
REQUEST NO.:**

Architect's Project # 3595001
DSA File/Appl. # 39-73/122127

Date: _____

1. SUBSTITUTION REQUEST

Attention: Affifa Kadhim

Contractor: Company _____

Contact: Name _____



Please submit only one product per request!

Sub Contractor: _____

Include with a specified product Submittal

Contact: _____

2. PROPOSED SUBSTITUTIONS: The undersigned requests consideration of the following substitution:

Specified Item: _____ Page No.: _____ Paragraph No.: _____

Proposed Item: _____

3. REASON FOR REQUEST:

4. REQUIREMENTS FOR SUBSTITUTIONS:

Attached data includes product description, specifications, drawings, photographs, performance and test data adequate for evaluation of request; applicable portions of data are clearly identified. Attached data also includes a description of changes to Contract Documents, which proposed substitution will require for its proper installation.

The undersigned certifies that the following paragraphs, unless modified by attachments, are correct:

1. The proposed substitution does not affect dimensions shown on drawings and does not require design changes in the Contract Documents.
2. The undersigned will pay for changes to the building design, including engineering design, detailing and construction costs caused by the requested substitution.
3. The proposed substitution will have no adverse effect on the work, the schedule or specified warranty requirements.
4. Maintenance and service parts will be readily available for the proposed substitution.

The undersigned further states that the function, appearance and quality of the proposed substitution are equivalent or superior to the specified item.

Signature - Contractor/Subcontractor _____

Date _____

5. TRANSMITTAL TO CONTRACTOR:

Distribution: Contractor, Owner, Project Inspector, RGA, Other

☐ ACCEPTED

☐ ACCEPTED AS NOTED

☐ REJECTED

Rainforth Grau Architects

By: _____

Date: _____

Comments:

Louis Bohn E.S. TK Portable Classroom Building
Tracy Unified School District

RFI NO.:

Architect's Project # 3595001
DSA File/Appl. # 39-73/122127

Date: _____

1. REQUEST FOR INFORMATION

Attention: Affifa Kadhim

From:

Contractor:

Company

Contact:

Name

Sub Contractor:

Contact:



Identify related specific references within the Contract Documents and supporting information:

Dwg./Document No.: _____

Building/Site Location: _____

2. Existing Condition (source / reason for the request):

3. Recommended Contractor Action(s) for resolution:

4. Project Inspector Acknowledgment:

Date Reviewed: _____

5. Owner / A/E Resolution(s):

Date of Response: _____ By: _____

Attachments: _____

Extra Work Involved in the Above Described Change?

Yes ☐

No ☐

Distribution: Contractor, Owner, Project Inspector, RGA, Other
See Specification Section 01300 for use of this form

Louis Bohn E.S. TK Portable Classroom Building
Tracy Unified School District

**E-DATA
REQUEST NO.:**

Architect's Project # 3595001
DSA File/Appl. # 39-73/122127

Date: _____

1. ELECTRONIC DATA REQUEST

Attention: Affifa Kadhim

From: Contractor: Company

Contact: Name

Sub Contractor:

Contact: _____



2. DATA REQUESTED - Provide list of specific drawings requested (include sheet numbers):

3. REASON FOR REQUEST - Provide clear explanation of why information is desired and for what purpose it will be utilized:

4. ACKNOWLEDGEMENT OF RESPONSIBILITY:

The electronic data files requested are distributed for reference only. Transferring such files can alter, delete or change original information. Accuracy of the data cannot be guaranteed as correct or complete and the Contractor accepts full responsibility for any and all inaccuracies, regardless of cause.

The hard copy documents, including addenda and subsequent written changes to the documents, represent the complete work of the contract and all electronic files should be cross-referenced and verified from that information as electronic files may not contain all contract information. It is the Contractor's responsibility to make any changes or revisions necessary.

This electronic data is furnished without guarantee of compatibility with your hardware or software. It is the Contractor's responsibility to notify the Architect in the event a compatibility problem or disk defect is encountered and a replacement disk is necessary.

This electronic data, in its present form, remains the property of Rainforth Grau Architects and shall not be used for any other purpose than to provide background information for the project noted above. It is not to be released to any other party without the written consent of Rainforth Grau Architects.

Accepted by: _____
Signature - Contractor/Subcontractor

Representing: _____
Contractor/Subcontractor Company Name

MEGGER GROUNDING TEST CERTIFICATE

This certifies that a Megger Grounding Test for the **Louis Bohn Elementary School - TK Portable Classroom Building** for the **Tracy Unified** School District, of **San Joaquin** County, California was conducted on the _____ day of _____, **2024**, per CCR Title 24, Sections 200 H and J. The undersigned verifies that the resistance to ground was 25 ohms or less, as required, and is found to be acceptable.

Project Name: _____

DSA File No.: _____ DSA Application No.: _____

Address: _____

General Contractor's Signature: _____

Electrical Contractor's Signature: _____

Testing Agency's Signature: _____

District Inspector's Signature: _____

SEPARATE CERTIFICATE IS REQUIRED FOR EACH SITE

CERTIFICATION OF CHLORINATION AND STERILIZATION

This certifies that _____ chlorinated the domestic hot and cold water plumbing lines for the **Louis Bohn Elementary School - TK Portable Classroom Building, Tracy Unified** School District. The lines were first flushed and chlorine was injected in the main water line on _____, **2024**. A minimum chlorine residual of 50 ppm was measured at each outlet. The lines were tagged, secured and the make-up water was shut off. On _____, **2024**, (a minimum of 24 hours later) the chlorine residual was retested and found to contain a minimum of 50 ppm. The plumbing lines were then thoroughly flushed with fresh water until the chlorine residual was not greater than 0.2 ppm at all outlets. A Bacteriological Examination report has been provided.

District Inspector Signature: _____

Date _____

Name of Chlorination and Testing Firm: _____

Authorized Representative Signature: _____

Date _____

Name of General Contractor: _____

Authorized Representative Signature: _____

Date _____

CERTIFICATION OF COMPLIANCE FOR BUILDING MATERIALS

This is to certify, in accordance with the Environmental Protection Agency requirements, that the materials and equipment used in the construction of the **Louis Bohn Elementary School - TK Portable Classroom Building** for the **Tracy Unified** School District of **San Joaquin** County, California, are asbestos free and are, therefore, not subject to monitoring for asbestos contamination.

Project Name: _____

Address: _____

Contractor: _____

Address: _____

Signature: _____

Title: _____

Date: _____

SEPARATE CERTIFICATE IS REQUIRED FOR EACH SITE

SITE STANDARDS

PART 1 – GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including without limitation, Site Access, Conditions, and Regulations;
- B. Special Conditions;
- C. Drug-Free Workplace Certification;
- D. Tobacco-Free Environment Certification;
- E. Criminal Background Investigation/Fingerprinting Certification;
- F. Temporary Facilities and Controls.

1.02 REQUIREMENTS OF THE DISTRICT:

- A. Drug-Free Schools and Safety Requirements:
 - (1) All school sites and other District Facilities have been declared "Drug-Free Zones." No drugs, alcohol and/or smoking are allowed at any time in any buildings and/or grounds on District property. No students, staff, visitors, or contractors are to use drugs on these sites.
 - (2) Smoking and the use of tobacco products by all persons is prohibited on or in District property. District property includes school buildings, school grounds, school-owned vehicles and vehicles owned by others while on District property. Contractor shall post: "Non-Smoking Area" in a highly visible location in each work area, staging area, and parking area. Contractor may designate a smoking area outside of District property within the public right-of-way, provided that this area remains quiet and unobtrusive to adjacent neighbors. This smoking area is to be kept clean at all times.
 - (3) Contractor shall ensure that no alcohol, firearms, weapons, or controlled substances enter or are used at the Site. Contractor shall immediately remove from the Site and terminate the employment of any employee(s) found in violation of this provision.
- B. Language: Profanity or other unacceptable and/or loud language will not be tolerated, "Cat calls" or other derogatory language toward students, staff, volunteers, parents or public will not be allowed.

C. Disturbing the Peace (Noise and Lighting):

- (1) Contractor shall observe the noise ordinance of the Site at all times including, without limitation, all applicable local, city, and/or state laws, ordinances, and/or regulations regarding noise and allowable noise levels.
- (2) The use of radios, etc., shall be controlled to keep all sound at a level that cannot be heard beyond the immediate area of use. District reserves the right to prohibit the use of radios at the Site, except for mobile phones or other handheld communication radios.
- (3) If portable lights are used after dark, all light must be located so as not to direct light into neighboring property.

D. Traffic:

- (1) Driving on the Premises shall be limited to periods when students and public are not present. If driving or deliveries must be made during the school hours, two (2) or more ground guides shall lead the vehicle across the area of travel. In no case shall driving take place across playgrounds or other pedestrian paths during recess, lunch, and/or class period changes. The speed limit on-the Premises shall be five (5) miles per hour (maximum) or less if conditions require.
- (2) All paths of travel for deliveries, including without limitation, material, equipment, and supply deliveries, shall be reviewed and approved by District in advance. Any damage will be repaired to the pre-damaged condition by the Contractor.
- (3) District shall designate a construction entry to the Site. If Contractor requests, District determines it is required, and to the extent possible, District shall designate a staging area so as not to interfere with the normal functioning of school facilities. Location of gates and fencing shall be approved in advance with District and at Contractor's expense.
- (4) Parking areas shall be reviewed and approved by District in advance. No parking is to occur under the drip line of trees or in softscape areas that could otherwise be damaged.

- E. All of the above shall be observed and complied with by the Contractor and all workers on the Site. Failure to follow these directives could result in individual(s) being suspended or removed from the work force at the discretion of the District. The same rules and regulations shall apply equally to delivery personnel, inspectors, consultants, and other visitors to the Site.

PART 2 - PRODUCTS Not Used.

PART 3 - EXECUTION Not Used.

END OF DOCUMENT

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Special environmental, sustainable, and “green” building practices related to indoor air quality, resource efficiency supplementing the Pollutant Control requirements specified under Section 01 8113.10, Sustainable Design Requirements, and to ensure healthy indoor air quality in final Project.
- B. Contractor is required to comply with sustainable building practices during construction and when considering materials for substitutions. Refer to Article “Design Requirements.”

1.2 RELATED REQUIREMENTS

- A. Section 01 6116, Volatile Organic Compound (VOC) Restrictions.
- B. Section 01 50 13, Construction Waste Management and Disposal.
- C. Section 01 8113, Sustainable Design Requirements.

1.3 ADMINISTRATIVE REQUIREMENTS

- A. Submittal Procedures:
 - 1. Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
 - 2. Sustainable Design Submittals shall comply with the additional requirement of Section 01 8113, Sustainable Design Requirements.
 - 3. Closeout Submittals shall be submitted in accordance with document 01 7700, Closeout Procedures.

1.4 DESIGN REQUIREMENTS

- A. Owner has established general environmental goals for design and for construction of the Project.
 - 1. In addition to the Contractor, the Contractor’s construction team, including subcontractors, suppliers, and manufacturers, are encouraged to participate where possible to realize the Owner’s environmental goals.
 - 2. Intent is for environmental goals to be achieved in a manner which ultimately provides a safe and healthy environment for building occupants with minimal impact on the local, regional and global environment.
- B. Environmental Goals:
 - 1. Refer to specific Specifications Sections for more detailed construction requirements related to specific materials and systems.

ENVIRONMENTAL PROCEDURES
SECTION 01 3543
3595001

1.5 INFORMATIONAL SUBMITTALS

A. Indoor Air Quality (IAQ) Data:

1. Environmental Issues: Submit emission test data produced by acceptable testing laboratory, listed in this Specification Article "Quality Assurance," for materials as required in each specific Specification Section.
 - a. Laboratory reports shall contain emissions test data on Volatile Organic Compounds (VOCs) including Total Volatile Organic Compounds (TVOC), specific individual VOCs, formaldehyde and other aldehydes as described in this Section.
 - b. Identify VOCs emitted by each material as required in these Specifications, and demonstrate compliance with the California Green Building Standards Code, edition current as of the date of this Contract.
 - c. Specific test conditions and requirements are set forth in the Specifications. For required tests, submit documentation of sample acquisition, handling, and test specimen preparation, as well as test conditions, methods, and procedures. The tests consist of a 10-day conditioning period followed by a 96-hour test period.
 - 1) Samples collected during the test period at 24, 48, and 96-hours shall be analyzed for TVOC and formaldehyde.
 - 2) VOC samples collected at 96 hours shall be identified and quantified for compounds that are found on the list of Chemicals of Concern. The Chemicals of Concern list is based on the California OEHHA list as of September 2002 (The most recent list shall be used for this Specification as published at:
 - a) http://www.oehha.org/air/chronic_rels/allChrels.html.
2. Cleaning and Maintenance Products: Provide data on manufacturers' recommended maintenance, cleaning, refinishing and disposal procedures for materials and products. These procedures are for final Contractor cleaning of the project prior to Substantial Completion and for provided materials and products as required by the specific Specification Sections.
 - a. Where chemical products are recommended for these procedures, provide documentation to indicate that no component present in the cleaning product at more than 1 percent of the total mass of the cleaning product is a carcinogen or reproductive toxicant as identified in the Chemicals of Concern list referenced above.
 - b. Avoid cleaning products containing alpha-pinene, d-limonene or other unsaturated carbon double bond alkenes due to chemical reactions with ozone to form aldehydes, acidic aerosols, and ultra-fine particulate matter in indoor air.

B. Certificates:

1. Prior to Final Completion, submit a certificate signed by corporate office holder of Contractor, subcontractor, supplier, vendor, installer or manufacturer primarily responsible for the manufacturing of the product, indicating materials provided are

essentially the same, and contain essentially the same components as products and materials tested.

2. Comply with requirements specified in Specification Section 01 7700, Closeout Procedures.

1.6 CLOSEOUT SUBMITTALS

- A. Submit data relating to Environmental Issues.
 1. Submit environmental product certifications, in two forms:
 - a. Two CD-ROMs organized by CSI Division Format.
 - b. Three three-ring binders organized by CSI Division Format with Table of Contents and with dividers for each Division.

1.7 QUALITY ASSURANCE

- A. Environmental Project Management and Coordination: Contractor to identify one person on Contractor's staff to be responsible for environmental issues compliance and coordination.
 1. Experience: Environmental project manager shall have experience relating to sustainable building construction.
 2. Responsibilities: Carefully review the Contract Documents for environmental issues, coordinate work of trades, subcontractors, and suppliers; instruct workers relating to environmental issues; and oversee Project Environmental Goals.
 3. Meetings: Discuss Environmental Goals at following meetings.
 - a. Pre-construction meeting.
 - b. Pre-installation meetings.
 - c. Regularly scheduled job-site meetings.
 - d. Special sustainability issues meetings.
- B. Environmental Issues Criteria: Comply with requirements listed in the Specification Sections.
- C. Acceptable Indoor Air Emissions Testing Laboratories:
 1. Selection of testing laboratories shall include assessment of prior experience in conducting indoor source emissions tests.
 2. The proposed laboratory shall be an independent company or organization not related to the manufacturer of the products to be tested.
 3. Submit documentation on proposed laboratory for review and approval by Owner.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Packaging: Deliver materials in recyclable or in reusable packaging such as cardboard, wood, paper, or reusable blankets, which will be reclaimed by supplier or manufacturer for recycling.

ENVIRONMENTAL PROCEDURES

SECTION 01 3543

3595001

1. Minimize packaging materials to maximum extent possible while still ensuring protection of materials during delivery, storage, and handling.
 2. Unacceptable Packaging Materials: Polyurethane, polyisocyanate, polystyrene, polyethylene, and similar plastic materials such as “foam” plastics and “shrink-fit” plastics.
 3. Reusable Blankets: Deliver and store materials in reusable blankets and mats reclaimed by the manufacturers or suppliers for reuse where the reclamation program exists or where a program can be developed for such reuse.
 4. Pallets: Where pallets are used, suppliers shall be responsible to ensure pallets are removed from site for reuse or for recycling.
 5. Corrugated Cardboard and Paper: Where paper products are used, recycle as part of the construction waste management recycling program, or return to the material’s manufacturer for use by the manufacturer or supplier.
 6. Sealants, Paint, Primers, Adhesives, and Coating Containers: Return to the supplier or manufacturer for reuse where such program is available.
- B. Comply with the additional requirements specified in Section 01 7419, Construction Waste Management and Disposal.

1.9 FIELD CONDITIONS

- A. No smoking will be permitted in indoor Project site locations, in accordance with California Labor Code (Section 400-6413.5).
- B. Environmental Product Certification:
1. Include certification that indicates cleaning materials comply with requirements of these Specifications.
- C. Construction Ventilation and Preconditioning:
1. Temporary Construction Ventilation: Maintain sufficient temporary ventilation of areas where materials are being used that emit VOCs. Maintain ventilation continuously during installation, and until emissions dissipate following installation. If continuous ventilation is not possible utilizing the building’s HVAC system(s) then ventilation shall be supplied using open windows and temporary fans, sufficient to provide no less than three air changes per hour.
 - a. Period after installation shall be sufficient to dissipate odors and elevated concentrations of VOCs. Where no specific period is stated in these Specifications, a time period of 72 hours shall be used.
 - b. Ventilate areas directly to outside; ventilation to other enclosed areas is not acceptable.
 2. During dust producing activities, including drywall installation and finishing, turn ventilation system off, and openings in supply and return HVAC system shall be protected from dust infiltration. Provide temporary ventilation as required.
 3. Preconditioning: Prior to installation, allow products which have odors and significant VOC emissions to off-gas in dry, well-ventilated space for 14 calendar days to allow for reasonable dissipation of odors and emissions prior to delivery to Project site and installation.

- a. Condition products without containers and packaging to maximize off-gassing of VOCs
- b. Condition products in ventilated warehouse or other building. Comply with substitution requirements for consideration of other locations.

D. Protection:

- 1. Moisture Stains: Materials with evidence of moisture damage, including stains, are not acceptable, including both stored and installed materials; immediately remove from site and properly dispose.
 - a. Take special care to prevent an accumulation of moisture on installed materials and within packaging during delivery, storage, and handling to prevent development of molds and mildew on packaging and on products
 - b. Immediately remove from site and properly dispose of materials showing signs of mold and signs of mildew, including materials with moisture stains.
 - c. Replace moldy materials with new, undamaged materials.
- 2. Ducts: Seal ducts during transportation, delivery, and construction to prevent accumulation of construction dust and construction debris inside of ducts.

PART 2 - PRODUCTS

2.1 SUBSTITUTIONS

- A. Requests for substitutions shall comply with requirements specified in Specification Section 01 3300, Submittals, and with the following additional information required where environmental issues are specified:
 - 1. Indicate how each proposed substitution complies with requirements for VOCs.
 - 2. Owner, in consultation with Architect reserve the right to reject proposed substitutions where data for VOCs is not provided or where emissions of individual VOCs are higher than for the specified materials.
 - 3. Comply with the specified recycled content and other environmental requirements.

PART 3 - EXECUTION

3.1 FIELD QUALITY CONTROL

- A. Sequencing:
 - 1. On-Site Application: Where odorous and/or high VOC emitting products are applied on-site, apply prior to installation of porous and fibrous materials. Where this is not possible, protect porous materials with polyethylene vapor retarders.
 - 2. Complete interior finish material installation no less than 14 days prior to Substantial Completion to allow for Building Flush Out as described in Paragraph 3.1B.

ENVIRONMENTAL PROCEDURES

SECTION 01 3543

3595001

- B. Building Flush Out: Just prior to Substantial Completion, flush out building air continuously using maximum tempered outside air, or maximum amount of outside air while achieving reasonable indoor temperature, for at least 14 calendar days. Continuously is defined as 24 hours per day, 7 days a week. If interruptions of more than a few hours are required for testing and balancing purposes, extend flush out period accordingly in order to achieve the minimum 14 calendar day building flush out period.
 - 1. When Contractor is required to perform touch-up work, provide temporary construction ventilation during installation and extend building flush-out by a minimum of 4 calendar days after touch-up installation is complete with maximum tempered outside air for 24 hours per day.
 - 2. If construction schedule permits, extend flush-out period beyond minimum building flush out period for an additional 15 days.
 - 3. Return ventilation system to normal operation following flush-out period to minimize energy consumption.

3.2 CLEANING

- A. Clean interior and exterior surfaces exposed to view; remove temporary labels, stains, and foreign substances; polish transparent and glossy surfaces using cleaning and maintenance products that conform to standards as described in Part 1 of this Section.
- B. Clean equipment and fixtures to sanitary condition using cleaning and maintenance products that conform to standards as described in Part 1 of this Section.
- C. Products used for cleaning shall comply with Proposition 65 and the additional restrictions for volatile organic compounds specified in Section 01 6116.
- D. Vacuum carpeted and soft surfaces with high efficiency particulate arrestor (HEPA) vacuum.
- E. If ducts were not sealed during construction, and contain dust or dirt, clean ducts using HEPA vacuum immediately prior to Substantial Completion and prior to using ducts to circulate air. Oil film on sheet metal shall be removed before shipment to site. Ducts shall be inspected to confirm that no oil film is present. Remove oil film.
- F. Replace air filters, both pre and final filters, just prior to Substantial Completion.
- G. Remove and properly dispose of recyclable materials using construction waste management program described in Section 01 7419, Construction Waste Management and Disposal.

3.3 PROTECTION

- A. Protect interior materials from water intrusion or penetration where interior products are not intended for wet applications and are exposed to moisture.
- B. Protect installed products using methods that do not support growth of mold and mildew.
 - 1. Immediately remove from site materials with mold or mildew.

END OF SECTION

*p:\sacramento\3595 tracy unified school district\001-000_villalovoz es new shade structures\08 specifications\06 spec\04
final\bohn\01 3543_environmental procedures.docx*

REGULATORY REQUIREMENTS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Obtaining of Permits, Licenses and Registrations and Work to Comply with All Applicable Laws and Regulations;
- B. Special Conditions; and
- C. Quality Control.

1.02 DESCRIPTION:

This section covers the general requirements for regulatory requirements pertaining to the Work and is supplementary to all other regulatory requirements mentioned or referenced elsewhere in the Contract Documents.

1.03 REQUIREMENTS OF REGULATORY AGENCIES:

- A. All statutes, ordinances, laws, rules, codes, regulations, standards, and the lawful orders of all public authorities having jurisdiction over the Work, are hereby incorporated into these Contract Documents as if repeated in full herein and are intended to be included in any reference to Code or Building Code, unless otherwise specified, including, without limitation, the references in the list below. Contractor shall make available at the Site copies of all the listed documents applicable to the Work as the District and/or Architect may request, including, without limitation, applicable portions of the California Code of Regulations ("CCR").
 - (1) California Building Standards Administrative Code, Part 1, Title 24, CCR.
 - (2) California Building Code (CBC), Part 2, Title 24, CCR; (International Building Code volumes 1-2 and California Amendments).
 - (3) California Electrical Code (CEC), Part 3, Title 24, CCR; (National Electrical Code and California Amendments).
 - (4) California Mechanical Code (CMC), Part 4, Title 24, CCR; (Uniform Mechanical Code and California Amendments).
 - (5) California Plumbing Code (CPC), Part 5, Title 24, CCR; (Uniform Plumbing Code and California Amendments).

- (6) California Fire Code (CFC), Part 9, Title 24, CCR; (International Fire Code and California Amendments).
- (7) California Green Building Standards Code (CALGreen), Part 11, Title 24, CCR.
- (8) California Referenced Standards Code, Part 12, Title 24, CCR.
- (9) State Fire Marshal Regulations, Public Safety, Title 19, CCR.
- (10) Partial List of Applicable National Fire Protection Association (NFPA) Standards:
 - (a) NFPA 13 - Automatic Sprinkler System.
 - (b) NFPA 14 - Standpipes Systems.
 - (c) NFPA 17A - Wet Chemical System
 - (d) NFPA 24 - Private Fire Mains.
 - (e) (California Amended) NFPA 72 - National Fire Alarm Codes.
 - (f) NFPA 253 - Critical Radiant Flux of Floor Covering System.
 - (g) NFPA 2001 - Clean Agent Fire Extinguishing Systems.
- (11) California Division of the State Architect interpretation of Regulations ("DSA IR"), including, without limitation:
 - (a) DSA IR A-6 — Construction Change Document Submittal and Approval Processes.
 - (b) DSA IR A-7 — Project Inspector Certification and Approval.
 - (c) DSA IR A-8 — Project Inspector and Assistant Inspector Duties and Performance.
 - (d) DSA IR A-12 — Assistant Inspector Approval.
- (12) DSA Procedures ("DSA PR")
 - (a) DSA PR 13-01 – Construction Oversight Process
 - (b) DSA PR 13-02 – Project Certification Process

B. This Project shall be governed by applicable regulations, including, without limitation, the State of California's Administrative Regulations for the Division of the State Architect-Structural Safety (DSA/SS), Chapter 4, Part 1, Title 24, CCR, and the most current version on the date the bids are opened and as it pertains to school construction including, without limitation:

- (1) Test and testing laboratory per Section 4-335. District shall pay for the testing laboratory.
- (2) Special inspections per Section 4-333(c).
- (3) Deferred Approvals per section 4-317(g).
- (4) Verified reports per Sections 4-336 & 4-343(c).
- (5) Duties of the Architect & Engineers shall be per Sections 4-333(a) and 4-341.
- (6) Duties of the Contractor shall be per Section 4-343.
- (7) Duties of Project Inspector shall be per Section 4-334.
- (8) Addenda and Construction Change Documents per Section 4-338.

Contractor shall keep and make available all applicable parts of the most current version of Title 24 referred to in the plans and specifications at the Site during construction.

C. Items of deferred approval shall be clearly marked on the first sheet of the Architect's and/or Engineer's approved Drawings. All items later submitted for approval shall be per Title 24 requirements to the DSA.

- (1) Contractor shall submit the following to Architect for review and endorsement:
 - (a) Product information on proposed material/system supplier.
 - (b) Drawings, specifications, and calculations prepared, signed, and stamped by an architect or engineer licensed in the State of California for that portion of the Work.
 - (c) All other requirements as may be required by DSA.
- (2) Cost of preparing and submitting documentation per DSA Deferred Approval requirements including required modifications to Drawings and Specifications, whether or not indicated in the Contract Documents, shall be borne by Contractor.
- (3) Contractor shall not begin fabrication and installation of deferred approval items without first obtaining DSA approval of Drawings and Specifications.
- (4) Schedule of Work Subject to DSA Deferred Approval: Window wall systems exceeding 10 feet in span.

PART 2 – PRODUCTS Not Used.

PART 3 – EXECUTION Not Used.

END OF DOCUMENT

ABBREVIATIONS AND ACRONYMS

PART 1 – GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions including without limitation, Definitions;
- B. Special Conditions.

1.02 DOCUMENT INCLUDES:

- A. Abbreviations used throughout the Contract Documents.
- B. Reference to a technical society, organization, or body is by abbreviation, as follows:

1.	AA	The Aluminum Association
2.	AASHTO	American Association of State Highway and Transportation Officials
3.	ABPA	Acoustical and Board Products Association
4.	ACI	American Concrete Institute
5.	AGA	American Gas Association
6.	AGC	Associated General Contractors of America
7.	AHC	Architectural Hardware Consultant
8.	AHRI	Air Conditioning, Heating, Refrigeration Institute
9.	AI	Asphalt Institute
10.	AIA	American Institute of Architects
11.	AISC	American Institute of Steel Construction
12.	AISI	American Iron and Steel Institute
13.	AMCA	Air Movement and Control Association
14.	ANSI	American National Standards Institute
15.	APA	APA – The Engineered Wood Association
16.	ASCE	American Society of Civil Engineers
17.	ASHRAE	American Society of Heating, Refrigeration and Air Conditioning Engineers
18.	ASME	American Society of Mechanical Engineers
19.	ASTM	American Society of Testing and Materials International
20.	AWPA	American Wood Protection Association
21.	AWPI	American Wood Preservers Institute
22.	AWS	American Welding Society
23.	AWSC	American Welding Society Code
24.	AWI	Architectural Woodwork Institute
25.	AWWA	American Water Works Association
26.	BIA	The Brick Industry Association

27.	CCR	California Code of Regulations
28.	CLFMI	Chain Link Fence Manufacturers Institute
29.	CRA	California Redwood Association
30.	CRSI	Concrete Reinforcing Steel Institute
31.	CS	Commercial Standards
32.	CSI	Construction Specifications Institute
33.	CTI	Cooling Technology Institute
34.	FGIA	Fenestration and Glazing Industry Alliance
35.	FGMA	Flat Glass Manufacturers' Association
36.	FIA	Factory Insurance Association
37.	FM	Factory Mutual Global
38.	FS/FED SPEC	Federal Specification
39.	FTI	Facing Title Institute
40.	GA	Gypsum Association
41.	IAPMO	International Association of Plumbing and Mechanical Officials
42.	ICC	International Code Council
43.	IEEE	Institute of Electrical and Electronics Engineers
44.	IES	Illuminating Engineering Society
45.	MCAC	Mason Contractors Association of California
46.	MIMA	Mineral Wool Insulation Manufacturers Association
47.	MLMA	Metal Lath Manufacturers Association
48.	MS/MIL SPEC	Military Specifications
49.	NAAMM	National Association of Architectural Metal Manufacturers
50.	NBHA	National Builders Hardware Association
51.	NCMA	National Concrete Masonry Association
52.	NCSEA	National Council of Structural Engineers Associations
53.	NEC	National Electrical Code
54.	NEMA	National Electrical Manufacturers Association
55.	NIST	National Institute of Standards and Technology
56.	NSI	Natural Stone Institute
57.	NTMA	National Terrazzo and Mosaic Association, Inc.
58.	ORS	Office of Regulatory Services (California)
59.	OSHA	Occupational Safety and Health Act
60.	PCI	Precast/Prestressed Concrete Institute
61.	PCA	Portland Cement Association
62.	PCA	Painting Contractors Association
63.	PDI	Plumbing Drainage Institute
64.	PEI	Porcelain Enamel Institute, Inc.
65.	PG&E	Pacific Gas & Electric Company
66.	PS	Product Standards
67.	SDI	Steel Door Institute; Steel Deck Institute
68.	SJI	Steel Joist Institute
69.	SSPC	Society for Protective Coatings
70.	TCNA	Tile Council of North America, Inc.
71.	TPI	Truss Plate Institute
72.	UBC	Uniform Building Code
73.	UL	Underwriters Laboratories Code

74.	UMC	Uniform Mechanical Code
75.	USDA	United States Department of Agriculture
76.	VI	Vermiculite Institute
77.	WCLIB	West Coast Lumber Inspection Bureau
78.	WDMA	Window and Door Manufacturers Association
79.	WEUSER	Western Electric Utilities Service Engineering Requirements
80.	WIC	Woodwork Institute of California

PART 2 - PRODUCTS Not Used.

PART 3 - EXECUTION Not Used.

END OF DOCUMENT

DEFINITIONS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions including without limitation, Definitions;
- B. Special Conditions.

1.02 QUALITY ASSURANCE

- A. For products or workmanship specified by association, trade, or Federal Standards, Contractor shall comply with requirements of the standard, except when more rigid requirements are specified in the Contract Documents, or are required by applicable codes.
- B. Contractor shall conform to current reference standard publication date in effect on the date of bid opening.
- C. Contractor shall obtain copies of standards unless specifically required not to by the Contract Documents.
- D. Contractor shall maintain a copy of all standards at jobsite during submittals, planning, and progress of the specific Work, until final completion, unless specifically required not to by the Contract Documents.
- E. Should specified reference standards conflict with Contract Documents, Contractor shall request clarification from the District and/or the Architect before proceeding.
- F. The contractual relationship of the parties to the Contract shall not be altered from the contractual relationship as indicated in the Contract Documents by mention or inference otherwise in any referenced document.
- G. Governing Codes shall be as shown in the Contract Documents including, without limitation, the Specifications.

END OF DOCUMENT

REFERENCES**PART 1 - GENERAL****1.01 SCHEDULE OF REFERENCES:**

The following information is intended only for the general assistance of the Contractor, and the District does not represent that all of the information is current. It is the Contractor's responsibility to verify the correct information for each of the entities listed.

AA	The Aluminum Association 1400 Crystal Drive, Suite 430 Arlington, VA 22202 www.aluminum.org	703/358-2960
AABC	Associated Air Balance Council 2401 Pennsylvania Avenue NW, Suite 330 Washington, DC 20037 www.aabc.com	202/737-0202
AASHTO	American Association of State Highway and Transportation Officials 555 12th St. NW - Suite 1000 Washington, DC 20004 www.transportation.org	202/624-5800
AATCC	American Association of Textile Chemists and Colorists P.O. Box 12215 Research Triangle Park, NC 27709-2215 www.aatcc.org	919/549-8141
ACA	American Coatings Association 901 New York Ave., NW, Suite 300 West Washington, DC 20001 www.paint.org	202/462-6272
ACI	American Concrete Institute 38800 Country Club Dr. Farmington Hills, MI 48331-3439 www.concrete.org	248/848-3800
ACPA	American Concrete Pipe Association 5605 N. MacArthur Blvd., Suite 340 Irving, TX 75038 www.concrete-pipe.org	972/506-7216

ADC	Air Duct Council 1901 N. Roselle Road, Suite 800 Schaumburg, IL 60195 www.flexibleduct.org	847/706-6750
AF&PA	American Forest and Paper Association 1101 K Street, NW, Suite 700 Washington, DC 20005 www.afandpa.org	202/463-2700
AGA	American Gas Association 400 North Capitol Street, NW, Suite 450 Washington, DC 20001 www.aga.org	202/824-7000
AGC	Associate General Contractors of America 2300 Wilson Blvd., Suite 300 Arlington, VA 22201 www.agc.org	703/548-3118
AHA	American Hardboard Association 1210 West Northwest Highway Palatine, IL 60067 http://domensino.com/AHA/default.htm	847/934-8800
AI	Asphalt Institute 2696 Research Park Drive Lexington, KY 40511-8480 www.asphaltinstitute.org	859/288-4960
AIA	The American Institute of Architects 1735 New York Ave., NW Washington, DC 20006-5292 www.aia.org	202/626-7300
AISC	American Institute of Steel Construction 130 East Randolph Street, Suite 2000 Chicago, IL 60601 www.aisc.org	312.670.2400
AISI	American Iron and Steel Institute 25 Massachusetts Ave., NW, Suite 800 Washington, DC 20001 www.steel.org	202/452-7100
AITC	American Institute of Timber Construction 1010 South 336th Street, #210 Federal Way, WA 98003-7394 https://www.plib.org/aitc/	253/835-3344

ALI	Associated Laboratories, Inc. P.O. Box 152837 Dallas, TX 75315 www.assoc-labs.com	214/565-0593
ALSC	American Lumber Standards Committee, Inc. 7470 New Technology Way, Suite F Frederick, MD 21703 www.alsc.org	301/972-1700
AMCA	Air Movement and Control Association International, Inc. 30 W. University Drive Arlington Heights, IL 60004 www.amca.org	847/394-0150
AMPP (formerly SSPC)	Association for Materials Protection and Performance (merger of Society for Protective Coatings and National Association of Corrosion Engineers International) (formerly Steel Structures Painting Council) 800 Trumbull Drive Pittsburgh, PA 15205 www.sspc.org	412/281-2331 877/281-7772
ANLA	AmericanHort (merger of American Nursery & Landscape Association and OFA – The Association of Horticultural Professionals) 2130 Stella Court Columbus, OH 43215 www.americanhort.org	614/487-1117
ANSI	American National Standards Institute 1899 L Street, NW, 11th Floor Washington, DC 20036 www.ansi.org	202/293-8020
APA	APA-The Engineered Wood Association 7011 S. 19th Street Tacoma, WA 98466-5333 www.apawood.org	253/565-6600

APA	Architectural Precast Association 325 John Knox Rd, Suite L-103 Tallahassee, FL 32303 www.archprecast.org	850/205-5637
APCIA	American Property Casualty Insurance Association (merger of American Insurance Association (formerly the National Board of Fire Underwriters) with the Property Casualty Insurers Association of America) 555 12th St, NW, Suite 550 Washington DC 20004 www.apci.org	202/828-7100
AHRI	Air Conditioning and Refrigeration Institute (now Air- Conditioning, Heating, & Refrigeration Institute) 2311 Wilson Blvd, Suite 400 Arlington, VA 22201 www.ahrinet.org	703/524-8800
ARMA	Asphalt Roofing Manufacturers Association 2331 Rock Spring Road Forest Hill, MD 21050 www.asphaltroofing.org	443/640-1075
ASA	The Acoustical Society of America Suite 300 1305 Walt Whitman Road Melville, NY 11747-4300 https://acousticalsociety.org/	516/576-2360
ASCE	American Society of Civil Engineers 1801 Alexander Bell Drive Reston, VA 20191 www.asce.org	800/548-2723 703/295-6300
ASHRAE	American Society of Heating, Refrigerating and Air Conditioning Engineers 180 Technology Parkway Peachtree Corners, GA 30092 www.ashrae.org	800/527-4723 404/636-8400
ASLA	American Society of Landscape Architects 636 Eye Street, NW Washington, DC 20001-3736 www.asla.org	202/898-2444
ASME	American Society of Mechanical Engineers Two Park Avenue New York, NY 10016-5990 www.asme.org	800/834-2763

ASPE	American Society of Plumbing Engineers 6400 Shafer Court, Suite 350 Rosemont, IL 60018 http://aspe.org	847/296-0002
ASQ	American Society for Quality P.O. Box 3005 Milwaukee, WI 53201-3005 or 600 North Plankinton Avenue Milwaukee, WI 53203 http://asq.org	800/248-1946 414/272-8575
ASSE	American Society of Sanitary Engineering 18927 Hickory Creek Dr., Suite 220 Mokena, IL 60448 www.asse-plumbing.org	708/995-3019
ASTM	ASTM International 100 Barr Harbor Drive PO Box C700 West Conshohocken, PA, 19428-2959 www.astm.org	610/832-9500
AWCI	Association of the Wall and Ceiling Industry 513 West Broad Street, Suite 210 Falls Church, VA 22046 www.awci.org	703/538-1600
AWPA	American Wood Protection Association (formerly American Wood Preservers Institute) P.O. Box 361784 Birmingham, AL 35236-1784 www.awpa.com	205/733-4077
AWS	American Welding Society 8669 NW 36 Street, Suite 130 Miami, FL 33166 www.aws.org	800/443-9353 305/443-9353
AWI	Architectural Woodwork Institute 46179 Westlake Drive, Suite 120 Potomac Falls, VA 20165-5874 www.awinet.org	571/323-3636
AWWA	American Water Works Association 6666 West Quincy Avenue Denver, CO 80235 www.awwa.org	800/926-7337 303/794-7711

BHMA	Builders Hardware Manufacturers Association 355 Lexington Avenue, 15th Floor New York, NY 10017 www.buildershardware.com	212/297-2122
BIA	The Brick Industry Association 12007 Sunrise Valley Drive, Suite 430 Reston, VA 20191 www.gobrick.com	703/620-0010
CGA	Compressed Gas Association 8484 Westpark Drive, Suite 220 McLean, VA 22102 www.cganet.com	703/788-2700
CISCA	Ceilings & Interior Systems Construction Association 1010 Jorie Blvd, Suite 30 Oak Brook, IL 60523 www.cisca.org	630/584-1919
CISPI	Cast Iron Soil Pipe Institute 2401 Fieldcrest Dr. Mundelein, IL 60060 www.cispi.org	224/864-2910
CLFMI	Chain Link Fence Manufacturers Institute 10015 Old Columbia Road, Suite B-215 Columbia, MD 21046 chainlinkinfo.org	301/596-2583
CPA	Composite Panel Association 19465 Deerfield Avenue, Suite 306 Leesburg, VA 20176 www.compositepanel.org	703/724-1128
CPSC	Consumer Product Safety Commission 4330 East-West Highway Bethesda, MD 20814 www.cpsc.gov	800/638-2772
CRA	California Redwood Association 818 Grayson Road, Suite 201 Pleasant Hill, CA 94523 www.calredwood.org	925/935-1499

CRI	Carpet and Rug Institute 100 S. Hamilton Street Dalton, GA 30722-2048 www.carpet-rug.org	706/278-3176
CRSI	Concrete Reinforcing Steel Institute 933 N. Plum Grove Road Schaumburg, IL 60173-4758 www.crsi.org	847/517-1200
CSI	The Construction Specifications Institute 123 North Pitt St, Suite 450 Alexandria, VA 22314 www.csinet.org	800/689-2900
CTIOA	Ceramic Tile Institute of America 12061 Jefferson Blvd. Culver City, CA 90230-6219 www.ctioa.org	310/574-7800
DHA	Decorative Hardwoods Association (formerly Hardwood Plywood & Veneer Association) 42777 Trade West Dr. Sterling, VA 20166 https://www.decorativehardwoods.org/	703/435-2900
DHI	Door and Hardware Institute (formerly National Builders Hardware Association) 2001 K Street NW, 3rd Floor North Washington, DC 20006 www.dhi.org	202/367-1134
DIPRA	Ductile Iron Pipe Research Association P.O. Box 190306 Birmingham, AL 35219 www.dipra.org	205/402-8700
DOC	U.S. Department of Commerce 1401 Constitution Ave., NW Washington, DC 20230 www.commerce.gov	202/482-2000
DOT	U.S. Department of Transportation 1200 New Jersey Avenue, SE Washington, DC 20590 www.dot.gov	855/368-4200
EJMA	Expansion Joint Manufacturers Association, Inc. 25 North Broadway Tarrytown, NY 10591 www.ejma.org	914/332-0040

EPA	Environmental Protection Agency Ariel Rios Building 1200 Pennsylvania Avenue, N.W. Washington, DC 20460 www.epa.gov	202/272-0167
FCICA	Floor Covering Installation Contractors Association 800 Roosevelt Rd., Bldg. C, Suite 312 Glen Ellyn, IL 60137 www.fcica.com	630/672-3702
FGIA	Fenestration and Glazing Industry Alliance 1900 E Golf Rd, Suite 1250 Schaumburg, IL 60173 https://fgiaonline.org/	847/303-5664
FM Global	Factory Mutual Insurance Company Amy Daley Global Practice Leader – Education, Public Entities, Health Care FM Global 270 Central Avenue Johnston, RI 02919-4949 www.fmglobal.com	401/275-3000 401/275-3029
FS	General Services Administration (GSA) Index of Federal Specifications, Standards and Commercial Item Descriptions 470 East L'Enfant Plaza, SW, Suite 8100 Washington, DC 20407 www.gsa.gov	202/619-8925
GA	The Gypsum Association 962 Wayne Ave., Suite 620 Silver Spring, MD 20910 www.gypsum.org	301/277-8686
HMA	Hardwood Manufacturers Association One Williamsburg Place, Suite 108 Warrendale, PA 15086 http://hmamembers.org	412/244-0440

IAPMO	International Association of Plumbing and Mechanical Officials (formerly the Western Plumbing Officials Association) 4755 E. Philadelphia St. Ontario, CA 91761 www.iapmo.org	909/472-4100
ICC	International Code Council 500 New Jersey Avenue, NW, 6th Floor Washington, DC 20001 www.iccsafe.org	888/422-7233
IEEE	Institute of Electrical and Electronics Engineers 3 Park Avenue, 17th Floor New York, NY 10016-5997 www.ieee.org	212/419-7900
IES	Illuminating Engineering Society 120 Wall Street, Floor 17 New York, NY 10005-4001 www.ies.org	212/248-5000
ITRK	Intertek Testing Services 3933 US Route 11 Cortland, NY 13045 www.intertek.com	607/753-6711
MCAA	Mechanical Contractors Association of America 1385 Piccard Drive Rockville, MD 20850 www.mcaa.org	301/869-5800
MMPA (formerly WMMPA)	Moulding & Millwork Producers Association (formerly Wood Moulding & Millwork Producers Association) 507 First Street Woodland, CA 95695 www.wmmpa.com	530/661-9591 800/550-7889
MSS	Manufacturers Standardization Society (MSS) of the Valve and Fittings Industry, Inc. 127 Park Street, NE Vienna, VA 22180-4602 http://mss-hq.org	703/281-6613
NAAMM	National Association of Architectural Metal Manufacturers 800 Roosevelt Rd. Bldg. C, Suite 312 Glen Ellyn, IL 60137 www.naamm.org	630/942-6591

NAIMA	North American Insulation Manufacturers Association P.O. Box 1906 Alexandria, VA 22313 https://insulationinstitute.org/	703/684-0084
NALP	National Association of Landscape Professionals (formerly Professional Landcare Network) 12500 Fair Lakes Circle, Suite 200 Fairfax, VA 22033 https://www.landscapeprofessionals.org/	703/736-9666
NAPA	National Asphalt Pavement Association 6406 Ivy Lane, Suite 350 Greenbelt, MD 20770-1441 www.asphaltpavement.org	888/468-6499 301/731-4748
NCSPA	National Corrugated Steel Pipe Association 14070 Proton Road, Suite 100 Dallas, TX 75244 www.ncspa.org	972/850-1907
NCMA	National Concrete Masonry Association 13750 Sunrise Valley Drive Herndon, VA 20171-4662 www.ncma.org	703/713-1900
NEBB	National Environmental Balancing Bureau 8575 Grovemont Circle Gaithersburg, MD 20877 www.nebb.org	301/977-3698
NECA	National Electrical Contractors Association 1201 Pennsylvania Ave. NW Washington, D.C., 20004 www.necanet.org	202/991-6300
NEMA	National Electrical Manufacturers Association 1300 North 17th Street N, Suite 900 Rosslyn, VA 22209 www.nema.org	703/841-3200
NEII	National Elevator Industry, Inc. 5537 SW Urish Road Topeka, KS 66610 https://nationalelevatorindustry.org/	703/589-9985
NFPA	National Fire Protection Association 1 Batterymarch Park Quincy, MA 02169-7471 www.nfpa.org	800/344-3555 855/274-8525

NGA (formerly GANA)	National Glass Association (merged with Glass Association of North America) 1945 Old Gallows Road Suite 750 Vienna, VA 22182 www.glass.org	866/342-5642 Ext 127
NHLA	National Hardwood Lumber Association PO Box 34518 Memphis, TN 38184 www.nhla.com	901/377-1818
NIA	National Insulation Association 516 Herndon Pkwy., Ste. D Herndon, VA 20170 www.insulation.org	703/464-6422
NRCA	National Roofing Contractors Association 10255 W. Higgins Road, Suite 600 Rosemont, IL 60018-5607 www.nrca.net	847/299-9070
NSF	NSF International 789 N. Dixboro Road Ann Arbor, MI 48113-0140 www.nsf.org	800/673-6275 734/769-8010
NSI	Natural Stone Institute (formerly Marble Institute of America) 380 E. Lorain St. Oberlin, OH 44074 https://www.naturalstoneinstitute.org/	440/250-9222
NTMA	National Terrazzo and Mosaic Association 209 N. Crockett Street, Suite 2 PO Box 2605 Fredericksburg, TX 78624 www.ntma.com	800/323-9736
OSHA	Occupational Safety and Health Act U.S. Department of Labor Occupational Safety & Health Administration 200 Constitution Ave., NW Washington, DC 20210 www.osha.gov	800/321-OSHA (6742)

PCA	Portland Cement Association 5420 Old Orchard Road Skokie, IL 60077 or 200 Massachusetts Ave NW, Suite 200 Washington, DC 20001 www.cement.org	847/966-6200 202/408-9494
PCA	Painting Contractors Association (formerly Painting and Decorating Contractors of America) 2316 Millpark Drive Maryland Heights, MO 63043 https://www.pcapainted.org/	800/322-7322
PCI	Precast/Prestressed Concrete Institute 8770 W. Bryn Mawr Ave., Suite 1150 Chicago, IL 60631 www.pci.org	312/786-0300
PDI	Plumbing & Drainage Institute 800 Turnpike Street, Suite 300 North Andover, MA 01845 http://pdionline.org	978/557-0720 800/589-8956
PEI	Porcelain Enamel Institute, Inc. P.O. Box 920220 Norcross, GA 30010 www.porcelainenamel.com	770/676-9366
PG&E	Pacific Gas & Electric Company P.O. Box 997300 Sacramento, CA 95899-7300 www.pge.com	800/743-5000
PLIB	Pacific Lumber Inspection Bureau (formerly West Coast Lumber Inspection Bureau) 1010 South 336th Street, Suite 210 Federal Way, WA 98003-7394 https://www.plib.org/	253/835-3344
RFCI	Resilient Floor Covering Institute 115 Broad Street, Suite 201 La Grange, GA 30240 www.rfci.com	706/882-3833
SDI	Steel Deck Institute P.O. Box 426 Glenshaw, PA 15116 www.sdi.org	412/487-3325

SDI	Steel Door Institute 30200 Detroit Road Westlake, OH 44145 www.steeldoor.org	440/899-0010
SJI	Steel Joist Institute 140 West Evans Street, Suite 203 Florence, SC 29501 http://steeljoist.org	843/407-4091
SMA	Stucco Manufacturers Association 5753 E Santa Ana Cyn Rd, #G-156 Anaheim, CA 92807 www.stuccomfgassoc.com	714/473-9579
SMACNA	Sheet Metal and Air Conditioning Contractors' National Association 4201 Lafayette Center Drive Chantilly, VA 20151-1219 www.smacna.org	703/803-2980
SPI	SPI: The Plastics Industry Trade Association, Inc. 1425 K St. NW, Suite 500 Washington, DC 20005 www.plasticsindustry.org	202/974-5200
TCA	The Tile Council of North America 100 Clemson Research Blvd. Anderson, SC 29625 www.tcnatile.com	864/646-8453
TPI	Truss Plate Institute 2670 Crain Highway, Suite 203 Waldorf, MD 20601 www.tpinst.org	240/587-5582
TPI	Turfgrass Producers International 444 E. Roosevelt Road #346 Lombard, IL 60148 www.turfgrasssod.org	800/405-8873 847/649-5555
TCIA	Tree Care Industry Association (formerly the National Arborist Association) 670 N Commercial Street, Suite 201 Manchester, NH 03101 www.tcia.org	603/314-5380 800/733-2622

TVI	The Vermiculite Institute c/o The Schundler Company 10 Central Street Nahant, MA 01908 www.vermiculiteinstitute.org	732/287-2244
UL	Underwriters Laboratories Inc. 333 Pfingsten Road Northbrook, IL 60062-2096 www.ul.com	847/272-8800 877/854-3577
UNI	Uni-Bell PVC Pipe Association 201 E. John Carpenter Freeway, Suite 750 Irving, TX 75062 www.uni-bell.org	972/243-3902
USDA	U.S. Department of Agriculture 1400 Independence Ave., S.W. Washington, DC 20250 www.usda.gov	202/720-2791
WA	Wallcoverings Association 35 E Wacker Dr., Suite 850 Chicago, IL 60601 www.wallcoverings.org	312/224-2574
WCMA	Window Covering Manufacturers Association 355 Lexington Avenue 15th Floor New York, NY 10017 www.wcmanet.org	212/297-2122
WDMA	Window & Door Manufacturers Association 2001 K Street NW, 3rd Floor North Washington, D.C. 20006 www.wdma.com	202/367-1157
WI	Woodwork Institute 1455 Response Road, Suite 110 Sacramento, CA 95815 www.wicnet.org	916/372-9943
WRI	Wire Reinforcement Institute 942 Main Street, Suite 300 Hartford, CT 06103 www.wirereinforcementinstitute.org	860/240-9545
WWCA	Western Wall & Ceiling Contractors Association 1910 N. Lime St. Orange, CA 92865 www.wwcca.org	714/221-5520

WWPA	Western Wood Products Association (formerly Redwood Inspection Service) 1500 SW First Ave., Suite 870 Portland, OR 97201 www.wwpa.org	503/224-3930
------	--	--------------

PART 2 - PRODUCTS Not Used.

PART 3 - EXECUTION Not Used.

END OF DOCUMENT

MATERIALS AND EQUIPMENT

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Purchase of Materials and Equipment;
- B. Special Conditions;
- C. Imported Materials Certification.

1.02 MATERIAL AND EQUIPMENT

- A. Only items approved by the District and/or Design Professional shall be used.
- B. Contractor shall submit lists of products and other product information in accordance with the Contract Documents, including, without limitation, the provisions regarding the submittals.

1.03 MATERIAL AND EQUIPMENT COLORS

- A. The District and/or Architect will provide a schedule of colors.
- B. No individual color selections will be made until after approval of all pertinent materials and equipment and after receipt of appropriate samples in accordance with the Contract Documents, including, without limitation, the provisions regarding the submittals.
- C. Contractor shall request priority in writing for any item requiring advance ordering to maintain the approved Construction Schedule.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. Contractor shall deliver manufactured materials in original packages, containers, or bundles (with seals unbroken), bearing name or identification mark of manufacturer.
- B. Contractor shall deliver fabrications in as large assemblies as practicable; where specified as shop-primed or shop-finished, package or crate as required to preserve such priming or finish intact and free from abrasion.
- C. Contractor shall store materials in such a manner as necessary to properly protect them from damage. Materials or equipment damaged by handling, weather, dirt, or from any other cause will not be accepted.

- D. Materials are not acceptable that have been warehoused for long periods of time, stored or transported in improper environment, improperly packaged, inadequately labeled, poorly protected, excessively shipped, deviated from normal distribution pattern, or reassembled.
- E. Contractor shall store material so as to cause no obstructions of sidewalks, roadways, access to the Site or buildings, and underground services. Contractor shall protect material and equipment furnished under Contract.
- F. Contractor may store materials on Site with prior written approval by the District, all material shall remain under Contractor's control and Contractor shall remain liable for any damage to the materials. Should the Project Site not have storage area available, the Contractor shall provide for off-site storage at a bonded warehouse and with appropriate insurance coverage at no cost to District.
- G. When any room in Project is used as a shop or storeroom, the Contractor shall be responsible for any repairs, patching, or cleaning necessary due to that use. Location of storage space shall be subject to prior written approval by District.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Manufacturers listed in various sections of Contract Documents are names of those manufacturers that are believed to be capable of supplying one or more of items specified therein.
- B. The listing of a manufacturer does not imply that every product of that manufacturer is acceptable as meeting the requirements of the Contract Documents.

2.02 FACILITIES AND EQUIPMENT

Contractor shall provide, install, maintain, and operate a complete and adequate facility for handling, the execution, disposal, and distribution of material and equipment as required for proper and timely performance of Work connected with Contract.

2.03 MATERIAL REFERENCE STANDARDS

Where material is specified solely by reference to "standard specifications" and if requested by District, Contractor shall submit for review data on actual material proposed to be incorporated into Work of Contract listing name and address of vendor, manufacturer, or producer, and trade or brand names of those materials, and data substantiating compliance with standard specifications.

PART 3 - EXECUTION

3.01 WORKMANSHIP

- A. Where not more specifically described in any other Contract Documents, workmanship shall conform to methods and operations of best standards and accepted practices of trade or trades involved and shall include items of fabrication, construction, or installation regularly furnished or required for completion (including finish and for successful operation, as intended).
- B. Work shall be executed by tradespersons skilled in their respective lines of Work. When completed, parts shall have been durably and substantially built and present a neat appearance.

3.02 COORDINATION

- A. Contractor shall coordinate installation of Work so as to not interfere with installation of others. Adjustment or rework because of Contractor's failure to coordinate will be at no additional cost to District.
- B. Contractor shall examine in-place work for readiness, completeness, fitness to be concealed or to receive other work, and in compliance with Contract Documents. Concealing or covering Work constitutes acceptance of additional cost which will result should in-place Work be found unsuitable for receiving other Work or otherwise deviating from the requirements of the Contract Documents.

3.03 COMPLETENESS

Contractor shall provide all portions of the Work, unless clearly stated otherwise, installed complete and operational with all elements, accessories, anchorages, utility connections, etc., in manner to assure well-balanced performance, in accordance with manufacturer's recommendations and by Contract Documents. Terms such as "installed complete," "operable condition," "for use intended," "connected to all utilities," "terminate with proper cap," "adequately anchored," "patch and refinish," "to match similar," should be assumed to apply in all cases, except where completeness of functional or operable condition is specifically stated as not required.

3.04 APPROVED INSTALLER OR APPLICATOR

Installation by a manufacturer's approved installer or applicator is an understood part of Specifications and only approved installer or applicator is to provide on-site Work where specified manufacturer has on-going program of approving (i.e. certifying, bonding, re-warranting) installers or applicators. Newly established relationships between a manufacturer and an installer or applicator who does not have other approved applicator work in progress or completed is not approved for this Project.

3.05 MANUFACTURER'S RECOMMENDATIONS

All installations shall be in accordance with manufacturer's published recommendations and specific written directions of manufacturer's representative.

Should Contract Documents differ from recommendations of manufacturer or directions of his representative, Contractor shall analyze differences, make recommendations to the District and the Architect in writing, and shall not proceed until interpretation or clarification has been issued by the District and/or the Architect.

END OF DOCUMENT

QUALITY CONTROL

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Inspector, Inspections and Tests, Uncovering of Work and Non-conforming of Work and Correction of Work;
- B. Special Conditions.

1.02 RELATED CODES:

- A. The Work is governed by requirements of Title 24, California Code of Regulations ("CCR"), and the Contractor shall keep a copy of these available at the job Site for ready reference during construction.
- B. The Division of the State Architect ("DSA") shall be notified at or before the start of construction.

1.03 OBSERVATION AND SUPERVISION:

- A. The District and Architect or their appointed representatives will review the Work and the Contractor shall provide facilities and access to the Work at all times as required to facilitate this review. Administration by the Architect and any consulting Structural Engineer will be in accordance with applicable regulations, including, without limitation, CCR, Part 1, Title 24, Section 4-341.
- B. One or more Project Inspector(s) approved by DSA and employed by or in contract with the District, referred to hereinafter as the "Project Inspector", will observe the work in accordance with CCR, Part 1, Title 24, Sections 4-333(b) and 4-342:
 - (1) The Project Inspector and Special Inspector(s) shall have access to the Work wherever it is in preparation or progress for ascertaining that the Work is in accordance with the Contract Documents and all applicable code sections. The Contractor shall provide facilities and operation of equipment as needed, and access as required and shall provide assistance for sampling or measuring materials.
 - (2) The Project Inspector will notify the District and Architect and call the attention of the Contractor to any observed failure of Work or material to conform to Contract Documents.

The Contractor shall conform with all applicable laws as indicated in the Contract Documents, including, without limitation, to CCR, Part 1, Title 24, Section 4-343.

The Contractor shall supervise and direct the Work and maintain a competent superintendent on the job who is authorized to act in all matters pertaining to the Work. The Contractor's superintendent shall also inspect all materials, as they arrive, for compliance with the Contract Documents. Contractor shall reject defective Work or materials immediately upon delivery or failure of the Work or material to comply with the Contract Documents. The Contractor shall submit verified reports as indicated in the Contract Documents, including, without limitation, the Specifications and as required by Part 1, Title 24, Section 4-336.

1.04 TESTING AGENCIES:

- A. Testing agencies and tests shall be in conformance with the General Documents and the requirements of Part 1, Title 24, Section 4- 335.
- B. Testing and inspection in connection with earthwork shall be under the direction of the District's consulting soils engineer, if any, referred to hereinafter as the "Soils Engineer."
- C. Testing and inspection of construction materials and workmanship shall be performed by a qualified laboratory, referred to hereinafter as the "Testing Laboratory." The Testing Laboratory shall be under direction of an engineer registered in the State of California, shall conform to requirements of ASTM E329, and shall be employed by or in contract with the District.
- D. Testing laboratory shall be approved by the Architect and the Division of the State Architect.
- E. Owner will employ and pay for services of an independent testing labatory to perform specified inspection and testing. Retesting cost for failed test will be Contractors responsibilityand will be back-charged against the contract.

1.05 TESTS AND INSPECTIONS:

- A. The Contractor shall be responsible for notifying the District and Project Inspector of all required tests and inspections. Contractor shall notify the District and Project Inspector at least seventy-two hours (72) hours in advance of performing any Work requiring testing or inspection.
- B. The Contractor shall provide access to Work to be tested and furnish incidental labor, equipment, and facilities to facilitate all inspections and tests.
- C. The District will pay for first inspections and tests required by the "CCR", and other inspections or tests that the District and/or the Architect may direct to have made, including the following principal items:
 - (1) Tests and observations for earthwork and paving.
 - (2) Tests for concrete mix designs, including tests of trial batches.
 - (3) Tests and inspections for structural steel work.
 - (4) Field tests for framing lumber moisture content.

- (5) Additional tests directed by the District that establish that materials and installation comply with the Contract Documents.
 - (6) Tests and observations of welding and expansion anchors.
- D. The District may at its discretion, pay and then back charge the Contractor for:
 - (1) Retests or reinspections, if required, and tests or inspections required due to Contractor error or lack of required identifications of material.
 - (2) Uncovering of work in accordance with Contract Documents.
 - (3) Testing done on weekends, holidays, and overtime will be chargeable to the Contractor for the overtime portion.
 - (4) Testing done off Site.
- E. Testing and inspection reports and certifications:
 - (1) If initially received by Contractor, Contractor shall provide to each of the following a copy of the agency or laboratory report of each test or inspection or certification.
 - (a) The District;
 - (b) The Construction Manager, if any;
 - (c) The Architect;
 - (d) The Consulting Engineer, if any;
 - (e) Other engineers on the Project, as appropriate;
 - (f) The Project Inspector; and
 - (g) The Contractor.
 - (2) When the test or inspection is one required by the CCR, a copy of the report shall also be provided to the DSA.

1.06 LABORATORY REPORTS

- A. After each inspection and test, promptly submit two copies of laboratory report to Owner, Architect, Contractor and DSA.
- B. Include:
 - (1) Date of issue,
 - (2) DSA Application and File numbers,
 - (3) Project title and number,

- (4) Name of inspector,
 - (5) Date and time of sampling or inspection,
 - (6) Identification of product and Specification Section,
 - (7) Location in the Project,
 - (8) Type of inspection or test,
 - (9) Date of test,
 - (10) Results of test,
 - (11) Conformance with Contract Documents.
- C. When requested by Architect, provide interpretation of test results.

1.07 LIMITS ON TESTING LABORATORY AUTHORITY

- A. Laboratory may not release, revoke, alter or enlarge on requirements of Contract Documents.
- B. Laboratory may not approve or accept any portion of the work.
- C. Laboratory may not assume any duties of Contractor.
- D. Laboratory has no authority to stop the work.

PART 2 - PRODUCTS

2.01 TYPE OF TEST AND INSPECTIONS

- A. Testing and inspection shall be in accordance with DSA Form 103 (or current version)
- B. Slump Test
ASTM C 143
- C. Concrete Tests

Testing agency shall test concrete used in the work per the following paragraphs:

- (1) Compressive Strength:
 - (a) Minimum number of tests required: One (1) set of three (3) cylinders for each 100 cubic yards (Sec. 2604(h) 01) of concrete or major fraction thereof, placed in one (1) day. See Title 24, Section 2605(g).

- (b) Two cylinders of each set shall be tested at twenty-eight (28) days. One (1) cylinder shall be held in reserve and tested only when directed by the Architect or District.
- (c) Concrete shall test the minimum ultimate compressive strength in twenty-eight 28 days, as specified on the structural drawings.
- (d) In the event that the twenty-eight (28) day test falls below the minimum specified strength, the effective concrete in place shall be tested by taking cores in accordance with UBC Standard No. 26-13 and tested as required for cylinders.
- (e) In the event that the test on core specimens falls below the minimum specified strength, the concrete will be deemed defective and shall be removed and replaced upon such direction of the Architect, and in a manner acceptable to the Division of the State Architect.

D. Reinforcing, Steel

PART 3 - EXECUTION Not Used.

END OF DOCUMENT

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Requirements for Testing Laboratory.
 - 2. Contractor's responsibilities for facilitation of Testing and Inspections.

1.2 RELATED SECTIONS AND DOCUMENTS

- ~~A. Geologic Hazards & Soils Report.~~
- B. DSA 103 - Structural Test & Inspections List.
- C. Section 31 0000, Earthwork.
- D. Individual Specification Sections: Inspections and tests required, and standards for testing.

1.3 REFERENCES

- A. California Administrative Code (CAC), edition as noted on the drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Building Code (CBC), edition as noted on the drawings, as adopted by the California Division of the State Architect (DSA).

1.4 SELECTION AND PAYMENT

- A. Testing laboratory shall be approved by both the Architect and the Division of the State Architect.
- B. Owner will employ and pay for services of an independent testing laboratory to perform specified inspection and testing. Retesting costs for failed tests will be the Contractors responsibility and will be back-charged against the contract.
- C. Under provisions for Relocatable Building construction, Owner limits his exposure to in-plant inspection and testing costs. Refer to other Specification Sections related to such specific construction.
- D. Employment of testing laboratory shall in no way relieve Contractor of obligation to perform work in accordance with requirements of Contract Documents.

1.5 LABORATORY REPORTS

- A. After each inspection and test, promptly submit two copies of laboratory report to Owner, Architect, Contractor and DSA.
- B. Include:

TESTING AND INSPECTION SERVICES

SECTION 01 4523

3595001

1. Date of issue,
2. DSA Application and File numbers,
3. Project title and number,
4. Name of inspector,
5. Date and time of sampling or inspection,
6. Identification of product and Specification Section,
7. Location in the Project,
8. Type of inspection or test,
9. Date of test,
10. Results of test,
11. Conformance with Contract Documents.

C. When requested by Architect, provide interpretation of test results.

1.6 LIMITS ON TESTING LABORATORY AUTHORITY

- A. Laboratory may not release, revoke, alter or enlarge on requirements of Contract Documents.
- B. Laboratory may not approve or accept any portion of the work.
- C. Laboratory may not assume any duties of Contractor.
- D. Laboratory has no authority to stop the work.

1.7 CONTRACTOR RESPONSIBILITIES

- A. Deliver to laboratory at designated location, adequate samples of materials proposed to be used which require testing, along with proposed mix designs. Allow reasonable time for review and testing.
- B. Arrange for, and coordinate with, laboratory for all required testing and inspection. Provide adequate notice, in advance, for proper scheduling and processing of testing. The Inspector will not be responsible for scheduling or arranging for testing and inspection services.
- C. Cooperate with laboratory personnel, and provide access to the work and to manufacturer's facilities.
- D. Provide incidental labor and facilities to provide access to work to be tested, to obtain and handle samples at the site or at the source of products to be tested, to facilitate tests and inspections, storage and curing of test samples.
- E. Notify Architect, Inspector, Structural Engineer (when applicable) and laboratory 24 hours prior to expected time for operations requiring inspection and testing services.

END OF SECTION

TESTING AND INSPECTION SERVICES
SECTION 01 4523
3595001

*p:\sacramento\3595 tracy unified school district\001-000_villalovoz es new shade structures\08 specifications\06 spec\04
final\bohn\01 4523_testing and inspection services.docx
Last Updated: December 16, 2021*

TEMPORARY FACILITIES AND CONTROLS

PART 1 – GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions;
- B. Special Conditions;
- C. Site Standards; and
- D. Construction Waste Management and Disposal.

1.02 TEMPORARY UTILITIES:

- A. Electric Power and Lighting:
 - (1) Contractor will pay for power during the course of the Work. To the extent power is available in the building(s) or on the Site, Contractor may use the District's existing utilities by making prearranged payments to the District for the utilities used by Contractor and all Subcontractors. Contractor shall be responsible for providing temporary facilities required to deliver that power service from its existing location in the building(s) or on the Site to point of intended use.
 - (2) Contractor shall verify characteristics of power available in building(s) or on the Site. Contractor shall take all actions required to make modifications where power of higher voltage or different phases of current are required. Contractor shall be fully responsible for providing that service and shall pay all costs required therefor.
 - (3) Contractor shall furnish, wire for, install, and maintain temporary electrical lights wherever it is necessary to provide illumination for the proper performance and/or observation of the Work: a minimum of 20 foot-candles for rough work and 50 foot-candles for finish work.
 - (4) Contractor shall be responsible for maintaining existing lighting levels in the project vicinity should temporary outages or service interruptions occur.
- B. Water:
 - (1) Contractor shall pay for water used during the course of the Work. Contractor shall coordinate and pay for installation or use of water meter in compliance with local water agency requirements. To the

extent water is then available in the building(s) or on the Site, Contractor may use the District's existing utilities by making prearranged payments to the District for the utilities used by Contractor and all Subcontractors. Contractor shall be responsible for providing temporary facilities required to deliver such utility service from its existing location in the building(s), on the Site, or other location approved by the local water agency, to point of intended use.

- (2) Contractor shall use backflow preventers on water lines at point of connection to District's water supply. Backflow preventers shall comply with requirements of Uniform Plumbing Code.
- (3) Contractor shall make potable water available for human consumption.

C. Sanitary Facilities:

- (1) Contractor shall provide sanitary temporary facilities in no fewer numbers than required by law and such additional facilities as may be directed by the Inspector for the use of all workers. The facilities shall be maintained in a sanitary condition at all times and shall be left at the Site until removal is directed by the Inspector or Contractor completes all other work at the Site.
- (2) Use of toilet facilities in the Work under construction shall not be permitted except by consent of the Inspector and the District.

D. Fire Protection:

- (1) Contractor shall provide and maintain fire extinguishers and other equipment for fire protection. Such equipment shall be designated for use for fire protection only and shall comply with all requirements of the California Fire, State Fire Marshall and/or its designee.
- (2) Where on-site welding and burning of steel is unavoidable, Contractor shall provide protection for adjacent surfaces.

E. Trash Removal:

- (1) Contractor shall provide trash removal on a timely basis. Under no circumstance shall Contractor use District trash service.

F. Field Office:

- (1) If Contractor chooses to provide a field office, it shall be an acceptable construction trailer that is well-lit and ventilated. The construction trailer shall be equipped with shelves, desks, filing cabinet, chairs, and such other items of equipment needed. Trailer and equipment are the property of the Contractor and must be removed from the Site upon completion of the Work.
- (2) Contractor shall provide any additional electric lighting and power required for the trailer. Contractor shall make adequate provisions for heating and cooling as required.

1.03 CONSTRUCTION AIDS:

- A. Plant and Equipment:
 - (1) Contractor shall furnish, operate, and maintain a complete plant for fabricating, handling, conveying, installing, and erecting materials and equipment; and for conveyances for transporting workers. Include elevators, hoists, debris chutes, and other equipment, tools, and appliances necessary for performance of the Work.
 - (2) Contractor shall maintain plant and equipment in safe and efficient operating condition. Damages due to defective plant and equipment, and uses made thereof, shall be repaired by Contractor at no expense to the District.
- B. None of the District's tools and equipment shall be used by Contractor for the performance of the Work.

1.04 BARRIERS AND ENCLOSURES:

- A. Contractor shall obtain the District's written permission for locations and types of temporary barriers and enclosures, including fire-rated materials proposed for use, prior to their installation.
- B. Contractor shall provide and maintain temporary enclosures to prevent public entry and to protect persons using other buildings and portions of the Site and/or Premises, the public, and workers. Contractor shall also protect the Work and existing facilities from the elements, and adjacent construction and improvements, persons, and trees and plants from damage and injury from demolition and construction operations.
- C. Contractor shall provide site access to existing facilities for persons using other buildings and portions of the Site, the public, and for deliveries and other services and activities.
- D. Tree and Plant Protection:
 - (1) Contractor shall preserve and protect existing trees and plants on the Premises that are not designated or required to be removed, and those adjacent to the Premises.
 - (2) Contractor shall provide barriers to a minimum height of 4'-0" around drip line of each tree and plant, around each group of trees and plants, as applicable, in the proximity of demolition and construction operations, or as denoted on the Plans.
 - (3) Contractor shall not park trucks, store materials, perform Work or cross over landscaped areas. Contractor shall not dispose of paint thinners, water from cleaning, plastering or concrete operations, or other deleterious materials in landscaped areas, storm drain systems, or sewers. Plant materials damaged as a result of the performance of the Work shall, at the option of the District and at Contractor's expense, either be replaced with new plant materials equal in size to

those damaged or by payment of an amount representing the value of the damaged materials as determined by the District.

- (4) Contractor shall remove soil that has been contaminated during the performance of the Work by oil, solvents, and other materials which could be harmful to trees and plants, and replace with good soil, at Contractor's expense.
- (5) Excavation around Trees:
 - (a) Excavation within drip lines of trees shall be done only where absolutely necessary and with written permission from the District.
 - (b) Where trenching for utilities is required within drip lines, tunneling under and around roots shall be by hand digging and shall be approved by the District. Main lateral roots and taproots shall not be cut. All roots 2 inches in diameter and larger shall be tunneled under and heavily wrapped with wet burlap so as to prevent scarring or excessive drying. Smaller roots that interfere with installation of new work may be cut with prior approval by the District. Roots must first be cut with a Vermeer, or equivalent, root cutter prior to any trenching.
 - (c) Where excavation for new construction is required within drip line of trees, hand excavation shall be employed to minimize damage to root system. Roots shall be relocated in backfill areas wherever possible. If encountered immediately adjacent to location of new construction, roots shall be cut approximately 6 inches back from new construction.
 - (d) Approved excavations shall be carefully backfilled with the excavated materials approved for backfilling. Backfill shall conform to adjacent grades without dips, sunken areas, humps, or other surface irregularities. Do not use mechanical equipment to compact backfill. Tamp carefully using hand tools, refilling and tamping until Final Acceptance as necessary to offset settlement.
 - (e) Exposed roots shall not be allowed to dry out before permanent backfill is placed. Temporary earth cover shall be provided, or roots shall be wrapped with four layers of wet, untreated burlap and temporarily supported and protected from damage until permanently relocated and covered with backfill.
 - (f) Accidentally broken roots should be sawed cleanly 3 inches behind ragged end.

1.05 SECURITY:

The Contractor shall be responsible for project security for materials, tools, equipment, supplies, and completed and partially completed Work.

1.06 TEMPORARY CONTROLS:

A. Noise Control:

- (1) Contractor acknowledges that adjacent facilities may remain in operation during all or a portion of the Work period, and it shall take all reasonable precautions to minimize noise as required by applicable laws and the Contract Documents.
- (2) Notice of proposed noisy operations, including without limitation, operation of pneumatic demolition tools, concrete saws, and other equipment, shall be submitted to the District a minimum of forty-eight (48) hours in advance of their performance.

B. Noise and Vibration:

- (1) Equipment and impact tools shall have intake and exhaust mufflers.
- (2) Contractor shall cooperate with District to minimize and/or cease the use of noisy and vibratory equipment if that equipment becomes objectionable by its longevity.

C. Dust and Dirt:

- (1) Contractor shall conduct demolition and construction operations to minimize the generation of dust and dirt, and prevent dust and dirt from interfering with the progress of the Work and from accumulating in the Work and adjacent areas including, without limitation, occupied facilities.
- (2) Contractor shall periodically water exterior demolition and construction areas to minimize the generation of dust and dirt.
- (3) Contractor shall ensure that all hauling equipment and trucks carrying loads of soil and debris shall have their loads sprayed with water or covered with tarpaulins, and as otherwise required by local and state ordinance.
- (4) Contractor shall prevent dust and dirt from accumulating on walks, roadways, parking areas, and planting, and from washing into sewer and storm drain lines.

D. Water:

- (1) Contractor shall not permit surface and subsurface water, and other liquids, to accumulate in or about the vicinity of the Premises. Should accumulation develop, Contractor shall control the water or other liquid, and suitably dispose of it by means of temporary pumps, piping, drainage lines, troughs, ditches, dams, or other methods.

E. Pollution:

- (1) No burning of refuse, debris, or other materials shall be permitted on or in the vicinity of the Premises.
- (2) Contractor shall comply with applicable regulatory requirements and anti-pollution ordinances during the conduct of the Work including, without limitation, demolition, construction, and disposal operations.

F. Lighting:

- (1) If portable lights are used after dark, all light must be located so as not to direct light into neighboring property.

1.07 PUBLICITY RELEASES:

- A. Contractor shall not release any information, story, photograph, plan, or drawing relating information about the Project to anyone, including press and other public communications medium, including, without limitation, on website(s) without the written permission of the District.

PART 2 – PRODUCTS Not used.

PART 3 – EXECUTION Not used.

END OF DOCUMENT

CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions;
- B. Special Conditions; and
- C. Temporary Facilities and Controls.

1.02 SECTION INCLUDES:

- A. Administrative and procedural requirements for the following:
 - (1) Salvaging non-hazardous construction waste.
 - (2) Recycling non-hazardous construction waste.
 - (3) Disposing of non-hazardous construction waste.

1.03 DEFINITIONS:

- A. Construction Waste: Building and site improvement materials and other solid waste resulting from construction, remodeling, renovation, or repair operations. Construction waste includes packaging.
- B. Demolition Waste: Building and site improvement materials resulting from demolition or selective demolition operations.
- C. Disposal: Removal off-site of demolition and construction waste and subsequent sale, recycling, reuse, or deposit in landfill or incinerator acceptable to authorities having jurisdiction.
- D. Recycle: Recovery of demolition or construction waste for subsequent processing in preparation for reuse.
- E. Salvage: Recovery of demolition or construction waste and subsequent sale or reuse in another facility.
- F. Salvage and Reuse: Recovery of demolition or construction waste and subsequent incorporation into the Work.

1.04 PERFORMANCE REQUIREMENTS:

- A. General: Develop waste management plan that results in end-of Project rates for salvage/recycling of sixty-five percent (65%) by weight (or by volume, but not a combination) of total waste generated by the Work.

1.05 SUBMITTALS:

- A. Waste Management Plan: Submit waste management plan within 30 days of date established for commencement of the Work.
- B. Waste Reduction Progress Reports: Concurrent with each Application for Payment, submit copies of report. Include the following information:
 - (1) Material category.
 - (2) Generation point of waste.
 - (3) Total quantity of waste in tons or cubic yards.
 - (4) Quantity of waste salvaged, both estimated and actual in tons or cubic yards.
 - (5) Quantity of waste recycled, both estimated and actual in tons or cubic yards.
 - (6) Total quantity of waste recovered (salvaged plus recycled) in tons or cubic yards.
 - (7) Total quantity of waste recovered (salvaged plus recycled) as a percentage of total waste.
- C. Waste Reduction Calculations: Before request for final payment, submit copies of calculated end-of-Project rates for salvage, recycling, and disposal as a percentage of total waste generated by the Work.
- D. Records of Donations: Indicate receipt and acceptance of salvageable waste donated to individuals and organizations. Indicate whether organization is tax exempt.
- E. Records of Sales: Indicate receipt and acceptance of salvageable waste sold to individuals and organizations. Indicate whether organization is tax exempt.
- F. Recycling and Processing Facility Records: Indicate receipt and acceptance of recyclable waste by recycling and processing facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.
- G. Landfill and Incinerator Disposal Records: Indicate receipt and acceptance of waste by landfills and incinerator facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.

- H. Qualification Data: For Waste Management Coordinator.
- I. Submittal procedures and quantities are specified in Document 01 33 00.

1.06 QUALITY ASSURANCE:

- A. Waste Management Coordinator Qualifications: LEED Accredited Professional by U.S. Green Building Council.
- B. Regulatory Requirements: Comply with hauling and disposal regulations of authorities having jurisdiction.
- C. Waste Management Conference: Conduct conference at Project site to comply with requirements. Review methods and procedures related to waste management including, but not limited to, the following:
 - (1) Review and discuss waste management plan including responsibilities of Waste Management Coordinator.
 - (2) Review requirements for documenting quantities of each type of waste and its disposition.
 - (3) Review and finalize procedures for materials separation and verify availability of containers and bins needed to avoid delays.
 - (4) Review procedures for periodic waste collection and transportation to recycling and disposal facilities.
 - (5) Review waste management requirements for each trade.

1.07 WASTE MANAGEMENT PLAN:

- A. General: Develop plan consisting of waste identification, waste reduction work plan, and cost/revenue analysis. Indicate quantities by weight or volume, but use same units of measurement throughout waste management plan.
- B. Waste Identification: Indicate anticipated types and quantities of site-clearing and construction waste generated by the Work. Include estimated quantities and assumptions for estimates.
- C. Waste Reduction Work Plan: List each type of waste and whether it will be salvaged, recycled, or disposed of in landfill or incinerator. Include points of waste generation, total quantity of each type of waste, quantity for each means of recovery, and handling and transportation procedures.
 - (1) Salvaged Materials for Reuse: For materials that will be salvaged and reused in this Project, describe methods for preparing salvaged materials before incorporation into the Work.

- (2) Salvaged Materials for Sale: For materials that will be sold to individuals and organizations, include list of their names, addresses, and telephone numbers.
- (3) Salvaged Materials for Donation: For materials that will be donated to individuals and organizations, include list of their names, addresses, and telephone numbers.
- (4) Recycled Materials: Include list of local receivers and processors and type of recycled materials each will accept. Include names, addresses, and telephone numbers.
- (5) Disposed Materials: Indicate how and where materials will be disposed of. Include name, address, and telephone number of each landfill and incinerator facility.
- (6) Handling and Transportation Procedures: Include method that will be used for separating recyclable waste including sizes of containers, container labeling, and designated location on Project site where materials separation will be located.

PART 2 - PRODUCTS Not Used.

PART 3 - EXECUTION

3.01 PLAN IMPLEMENTATION:

- A. General: Implement approved waste management plan. Provide handling, containers, storage, signage, transportation, and other items as required to implement waste management plan during the entire duration of the Contract.
 - (1) Comply with Document 01 50 00 for operation, termination, and removal requirements.
- B. Training: Train workers, subcontractors, and suppliers on proper waste management procedures, as appropriate for the Work occurring at Project site.
 - (1) Distribute waste management plan to everyone concerned within 3 days of submittal return.
 - (2) Distribute waste management plan to entities when they first begin work on site. Review plan procedures and locations established for salvage, recycling, and disposal.
- C. Site Access and Temporary Controls: Conduct waste management operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.

- (1) Designate and label specific areas of Project site necessary for separating materials that are to be salvaged, recycled, reused, donated, and sold.
- (2) Comply with Document 01 50 00 for controlling dust and dirt, environmental protection, and noise control.

3.02 RECYCLING CONSTRUCTION WASTE:

- A. General: Recycle paper and beverage containers used by on-site workers.
- B. Recycling Incentives: Revenues, savings, rebates, tax credits, and other incentives received for recycling waste materials shall accrue to the Contractor.
- C. Procedures: Separate recyclable waste from other waste materials, trash, and debris. Separate recyclable waste by type at Project site to the maximum extent practical.
 - (1) Provide appropriately marked containers or bins for controlling recyclable waste until they are removed from Project Site. Include list of acceptable and unacceptable materials at each container and bin.
 - (a) Inspect containers and bins for contamination and remove contaminated materials if found.
 - (2) Stockpile processed materials on site without intermixing with other materials. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
 - (3) Stockpile materials away from construction area. Do not store within drip line of remaining trees.
 - (4) Store components off the ground and protect from the weather.
 - (5) Remove recyclable waste off District property and transport to recycling receiver or processor.
- D. Packaging:
 - (1) Cardboard and Boxes: Break down packaging into flat sheets. Bundle and store in a dry location.
 - (2) Polystyrene Packaging: Separate and bag material.
 - (3) Pallets: As much as possible, require deliveries using pallets to remove pallets from Project Site. For pallets that remain on Site, break down pallets into component wood pieces and comply with requirements for recycling wood.
 - (4) Crates: Break down crates into component wood pieces and comply with requirements for recycling wood.

- E. Site-Clearing Wastes: Chip brush, branches, and trees on site.
- F. Wood Materials:
 - (1) Clean Cut-Offs of Lumber: Grind or chip into small pieces.
 - (2) Clean Sawdust: Bag sawdust that does not contain painted or treated wood.

3.03 DISPOSAL OF WASTE:

- A. General: Except for items or materials to be salvaged, recycled, or otherwise reused, remove waste materials from Project Site and legally dispose of them in a landfill or incinerator acceptable to authorities having jurisdiction.
 - (1) Except as otherwise specified, do not allow waste materials that are to be disposed of accumulate on site.
 - (2) Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
- B. Burning: Do not burn waste materials.
- C. Disposal: Transport waste materials off District property and legally dispose of them.

END OF DOCUMENT

FIELD OFFICES

PART 1 – GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions;
- B. Special Conditions; and
- C. Temporary Facilities and Controls.

1.02 SECTION INCLUDES:

- A. Requirements for Field Offices and Field Office Trailers.

1.03 SUMMARY:

- A. General: Contractor shall provide District's Field Office Trailer and contents, for District's use exclusively, during the term of the Contract.
- B. Property: Trailer, furniture, furnishings, equipment, and the like, supplied by the Contractor with the Office Trailer shall remain the property of the Contractor; District property items installed, delivered, and the like by District within the Office Trailer will remain District's property.
- C. Modifications: District reserves the right to modify the trailer or contents, or both, as may be deemed proper by District.
- D. Condition: Trailer and contents shall be clean, neat, substantially finished, in good, proper, and safe condition for use, operation, and the like; the trailer and contents shall not be required to be new.
- E. Installation Timing: Provide safe, fully furnished, functional, proper, complete, and finished trailer properly ready for entire use, within fourteen (14) calendar days of District's notification of the issuance of Notice to Proceed.

1.04 SUBMITTALS:

- A. General: Submit submittals to District in quantity, format, type, and the like, as specified herein.
- B. Office Trailer Data: One (1) copy of manufacturer's descriptive data, technical descriptions, regulatory compliance, industry standards, installation, removal, and maintenance instructions.

- C. Equipment Data: Two (2) copies of manufacturer data for each type of equipment, if directed by District.
- D. Furniture and Furnishings Data: Two (2) copies of manufacturer data for each type of equipment, if directed by District.
- E. Plans: One (1) reproducible copy of appropriately scaled plans of trailer layout. Plans shall include, but not be limited to: lighting; furniture; equipment; telephone and electrical outlets; and the like.
- F. Product Samples: One (1) complete and entire unit of each type, if directed by District.

1.05 QUALITY ASSURANCE

- A. Standards: In the event that provisions of codes, regulations, safety orders, Contract Documents, referenced manufacturer's specifications, manufacturer's instructions, industry standards, and the like, are in conflict, the more restrictive and higher quality shall govern.
- B. Installer: Installer or Installers engaged by Contractor must have a minimum of five (5) years of documented and properly authenticated successful experience of specialization in the installation of the items or systems, or both, specified herein.
- C. Manufacturer: Contractor shall obtain products from nationally and industry recognized Manufacturer with five (5) years minimum, of immediately recent, continuous, documented and properly authenticated successful experience of specialization in the manufacture of the product specified herein.
- D. State Personnel Training: Provide proper training for maintenance and operations, including emergency procedures, and the like, as directed by District.
- E. Units: Shall be sound and free of defects, and shall not include any damage or defect that will impair the safety, installation, performance, or the durability of the entire Office Trailer and appurtenant systems.

1.06 REGULATORY REQUIREMENTS

- A. General: Work shall be executed in accordance with applicable Codes, Regulations, Statutes, Enactments, Rulings, Laws, each authority having jurisdiction, and including, but not limited to, Regulatory Requirements specified herein.
- B. California Building Standards Code ("CBSC").
- C. California Code of Regulations, Title 25, Chapter 3, Sub Chapter 2, Article 3 ("CCR").
- D. Coach Insignia: Trailer shall display California Commercial Coach Insignia; such insignia shall be deemed to show that the trailer is in accordance with the Construction and Fire Safety requirements of CCR.

PART 2 – PRODUCTS

2.01 FIELD OFFICE TRAILER

- A. General: Provide entire Field Office Trailer of type, function, operation, capacity, size, complete with controls, safety devices, accessories, and the like, for proper and durable installation. Partitions, walls, ceiling, and other interior and exterior surfaces shall be appropriately finished, including, but not limited to, trim, painting, wall base, floor covering, suspended or similar ceiling, and the like; provide systems, components, units, nuts, bolts, screws, anchoring devices, fastening devices, washers, accessories, adhesives, sealants, and other items of type, grade, and class required for the particular use, not identified but required for a complete, weather-tight, appropriately operating, and finished installation.
- B. Manufacturers: General Electric Capital Modular Space; The Space Place, Inc.; or equal.
- C. Program: Provide a wheel-mounted trailer with stairs, landings, platforms, ramps, and the like, in good, proper, safe, clean, and properly finished condition; with proper heavy duty locks, and other proper and effective security at all doors, windows, and the like. Trailer shall be maintained in good, proper, safe, clean, and properly finished condition during the Contract.
 - (1) Nominal Trailer Size: Four hundred eighty (480) square feet, minimum.
 - (2) Stairs, Platform: Properly finished stairs, platforms, and ramps.
 - (3) Doors: Two (2), three (3) foot wide exterior doors with locksets; finished ramp, steps, and entry platform at each exterior door.
 - (4) Keys: Submit five (5) keys for each door, window, furniture unit, and the like. There shall be no other key copies or originals available; each key shall be identified for District; and shall be labeled, or tagged
 - (5) Lighting: Sixty-five (65) foot-candles illumination minimum at any point, at thirty (30) inches above finished floor throughout from fluorescent light source, exclusively, or as directed by District.
 - (6) Electrical Outlets: One (1) duplex outlet evenly spaced every twelve (12) linear horizontal feet of wall face, and electrical service ready for use.

2.02 FIELD OFFICE TRAILER ITEMS

- A. General: Provide the Field Office Trailer with the following arranged into two (2) workstations:
 - (1) Desks: Two (2) desks: thirty-six (36) inches by sixty (60) inches; steel, laminated plastic top; locking, one (1) or two (2) file drawers single pedestal; steel; provide five (5) keys to District.

- (2) Tables: Two (2) tables; thirty-six (36) inches by sixty (60) inches; twenty-nine (29) inches high; steel, laminated plastic top tables; one (1) at each desk.
 - (3) Chairs: Two (2) chairs: swivel; steel; with seat cushion and arms; one (1) at each desk.
 - (4) Waste Baskets: Two (2) waste baskets, one at each desk.
- B. Furniture and Equipment: Provide in the space located to effect efficient and logical use.
- (1) File cabinet: One (1); four (4) drawer; lateral; steel locking.
 - (2) Plan Table: One (1) plan table: thirty-six (36) inches deep by seventy-two (72) inches wide by forty-two (42) inches high; adjustable; wood or steel; with lockable plan and pencil drawers.
 - (3) Drafting Stool: One (1) drafting stool; swiveling; steel; padded; adjustable; with footrest and casters.
 - (4) Bookshelf: One (1) bookshelf: thirty-six (36) inches deep by seventy-two (72) inches wide by forty-two (42) inches high; adjustable; wood or steel; with lockable plan and pencil drawer.
 - (5) Plan Rack: One (1) wheel mounted plan rack.
 - (6) Waste Baskets: One (1) large waste basket.
 - (7) Coat/Hat Hanger: Wall mounted with minimum capacity for four (4) garments and ten (10) hats.
 - (8) Document Management System: Shall include an integrated high-volume printer, copier, and facsimile machine, including stand, base, and storage cabinet; and shall include the following features:
 - (a) Type: Laser, dry electrostatic transfer, plain paper, digital, multi-function imaging system.
 - (b) Network: Ethernet or Token Ring network ready, Plug-and-Play.
 - (c) Print, send/receive facsimile from any connected workstation.
 - (d) Resolution: Six hundred (600) dots per inch by six hundred (600) dots per inch, minimum.
 - (e) Print Speed: Twenty (20) pages per minute, minimum.
 - (f) Copies: Twenty (20) copies per minute, minimum.
 - (g) Document Handler: Forty (40) sheet, minimum

- (h) Collator: Forty (40) bin, minimum, with stapling.
- (i) Duplexing: Capable.
- (j) Paper Size: Capable of handling paper sizes to eleven (11) inches by seventeen (17) inches.
- (k) Paper Cassettes: One (1) each for eight and one half (8.5) inches by eleven (11) inches, eight and one half (8.5) inches by fourteen (14) inches, and eleven (11) inches by seventeen (17) inches paper sizes; minimum two hundred fifty (250) sheets per cassette.
- (l) Reduction/Enlargement: Capable of reduction to twenty-five percent (25%) and enlargement to two hundred percent (200%).
- (m) Facsimile Electronic Storage: Capable of storing minimum of fifty (50) speed dial numbers, group faxing and broadcast faxing.
- (n) Facsimile Scanning: Capable of scanning into memory a minimum of one hundred (100) pages with maximum scan time of three (3) seconds per page.
- (o) Halftone: Sixty-four (64) levels.
- (p) Redial: Automatic and Manual.
- (9) Maintenance: Contractor shall purchase service agreements for each unit of equipment for the duration of the project plus two (2) months, and shall maintain all equipment in proper working condition. Service agreements shall include provision for replacement of toner cartridges and other items required to effect proper unit use. Service agreements shall also provide for:
 - (a) Unlimited Service Calls.
 - (b) Same Day Response.
 - (c) All parts, labor, preventative maintenance and mileage.
 - (d) All chemicals, such as toner, fixing agent, and the like.
 - (e) System training and setup.
- (10) Portable Toilets: Two (2); each shall include a urinal; each unit shall be a properly enclosed chemical unit conforming to ANSI Z4.3.
 - (a) Location: As directed by District.
 - (b) Maintenance: Maintain each unit and surrounding areas in a clean, hygienic and orderly manner, at all time. Empty, clean,

and sanitize each unit each day at a location and time as directed by District.

- (c) Removal: Relocate, or remove from the site, each Portable Toilet. Upon such directive by District, the Contractor shall forthwith relocate or remove each Portable Toilet and submit the affected areas to a condition which existed prior to the installation of each Portable Toilet, within three (3) calendar days, or as directed by District in writing, at no cost to District.

2.03 UTILITY AND SERVICES

- A. Telephone Service: Contractor shall provide and interface the entire telephone service, and shall properly and timely pay for telephone service for District's non-long-distance use.
- B. Electrical Service: Provide all proper connections and continuously pay for service for the duration of the Work.

2.04 FINISHES

- A. General: Manufacturer standard finish system over surfaces properly cleaned, pretreated, and prepared to obtain proper bond; all visible surfaces shall be coated.
- B. Finish: Color as selected by District from manufacturer standard palette.

PART 3 – EXECUTION

3.01 INSTALLATION

- A. General: Properly prepare area and affected items to receive the Work. Set Work accurately in location, alignment, and elevation; rigidly, securely, and firmly anchor to appropriate structure; install plumb, straight, square, level, true, without racking, rigidly anchored to proper solid blocking, substrate, and the like; provide appropriate type and quantity of reinforcements, fasteners, adhesives, self-adhesive and other tapes; lubricants, coatings, accessories, and the like, as required for a complete, structurally rigid, stable, sound, and appropriately finished installation, in accordance with manufacturer's published instructions, and as indicated. The more restrictive and higher quality requirement shall govern. Moving parts shall be properly secured, without binding, looseness, noise, and the like.
- B. Installation: Install in accordance with 25 CCR 3.2.3 and as directed by District; jack up trailer and level both ways; mount on proper concrete piers with all load off wheels; provide required tie down and accessories per Section 4368 of referenced CCR, and as directed by District.
- C. Rejected Work: Work, materials, unit, items, systems, and the like, not accepted by District shall be deemed rejected, and shall forthwith be removed and replaced with proper and new Work, materials, unit, items, systems, and the like at no cost to District.

- D. Standard: Comply with manufacturer's published instructions, or with instructions as shown or indicated; the more restrictive and higher quality requirement shall govern.
- E. Location: As directed by District.
- F. Fire Resistance: Construct and install in accordance with UL requirements.
- G. Maintenance: Contractor shall maintain trailer and adjacent areas in a safe, clean and hygienic condition throughout the duration of the Work, and as directed by District. Properly repair or replace furniture or other items, as directed by District. Properly remove unsafe, damaged, or broken furniture, or similar items, and replace with safe and proper items. Contractor shall pay cost of all services, repair, and maintenance, or replacement of each item.
- H. Janitorial Service: Provide professional janitorial services, including, but not limited to, trash, waste paper baskets, fill paper dispensers; clean and dust all furniture, files, and the like; sweep and mop resilient and similar flooring; and vacuum carpeting and similar flooring.
 - (1) Frequency: Two (2) times per week, minimum.
- I. Removal: Properly remove the Office Trailer and contents from the Site upon completion of the Contract, or as directed by District in writing. Forthwith properly patch and repair affected areas; replace damaged items with new items. Carefully and properly inventory, clean, pack, store, and protect District property; submit District property to District at a date, time and location as directed by District.

END OF DOCUMENT

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: VOC restrictions for product categories listed below under Article "DEFINITIONS" and in compliance with the following.
 - 1. California Code of Regulations, Title 24, Part 11 California Green Building Standards Code.
 - 2. Local Agency.
 - 3. No Rating System is applicable.
- B. Products of each category that are installed in the project must comply; applicable laws and ordinances do not allow for partial compliance.
- C. Listing of a product in these Specifications shall not be construed as a solicitation or requirement to use any product or combination of products in violation of the requirements of South Coast Air Quality Management District Rule No.1168, as described in Rule 1168(g).
 - 1. If a listed product does not meet the requirements of this rule, request approval for use of an alternate product by the same or another manufacturer meeting the requirements of this rule.
 - 2. Do not use products which do not meet the requirements of this rule.

1.2 RELATED REQUIREMENTS

- A. Divisions 01 through 33 contain related requirements specific to the work of each of these Sections. Requirements may or may not include reference to this Section.
- B. Section 01 8113, Sustainable Design Requirements, for CAL-Green general requirements and procedures.

1.3 REFERENCES

- A. California Green Building Standards Code (CALGreen), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. Low-Emitting Materials Product List; California Collaborative for High Performance Schools (CHPS); current edition at www.chps.net/.
- C. CRI (GLCC) - Green Label Testing Program - Approved Product Categories for Carpet Cushion; Carpet and Rug Institute; current edition.
- D. CRI (GLP) - Green Label Plus Carpet Testing Program - Approved Products; Carpet and Rug Institute; current edition.
- E. GEI (SCH) - GREENGUARD "Children and Schools" Certified Products; GREENGUARD Environmental Institute; current listings at www.greenguard.org.

VOLATILE ORGANIC COMPOUND (VOC) RESTRICTIONS

SECTION 01 6116

3595001

- F. GreenSeal GS-36 - Commercial Adhesives; Green Seal, Inc.
- G. SCAQMD 1168 - South Coast Air Quality Management District Rule No.1168; current edition; www.aqmd.gov.
- H. SCS (CPD) - SCS Certified Products; Scientific Certification Systems; current listings at www.scs-certified.com.

1.4 DEFINITIONS

- A. VOC-Restricted Products: Products of each of the following categories when installed or applied on-site:
 - 1. Adhesives, sealants, and sealer coatings, regardless of specification Section or Division.
 - 2. Paints and coatings.
 - 3. Carpet and resilient flooring.
 - 4. Composite wood products; plywood, particleboard, wood fiberboard.
- B. Adhesives: Gunnable, trowelable, liquid-applied, and aerosol adhesives, whether specified or not; including flooring adhesives, resilient base adhesives, and pipe jointing adhesives.
- C. Sealants: Gunnable, trowelable, and liquid-applied joint sealants and sealant primers, whether specified or not; including firestopping sealants and duct joint sealers.

1.5 SUBMITTAL REQUIREMENTS

- A. Product Data: For each VOC-restricted product used in the project, submit product data showing compliance, except when another type of evidence of compliance is required.
- B. Verification of Compliance: Submit for each different product in each applicable category.
 - 1. Identify evidence submittals with the words "CALGreen VOC Compliance Report".
- C. Installer Certifications for Accessory Materials:
 - 1. Require each installer of any type of product, not just the products for which VOC restrictions are specified, to certify that either 1) no adhesives, joint sealants, paints, coatings, or composite wood or agrifiber products have been used in the installation of their products, or 2) that such products used comply with these requirements.
 - 2. Use the form following at the end of Part 3 in this Section for Installer certifications.

1.6 QUALITY ASSURANCE

- A. Manufacturer's Testing Agency Qualifications: Independent firm specializing in performing testing and inspections of the type specified in this Section.

VOLATILE ORGANIC COMPOUND (VOC) RESTRICTIONS
SECTION 01 6116
3595001

PART 2 - PRODUCTS

2.1 MATERIALS

A. General:

1. Provide products conforming to local, State and Federal government requirements limiting the amount of volatile organic compounds contained in the product, for its intended application. If specified product exceeds current requirement, provide conforming product at no additional cost.
2. Provide only products having volatile organic compound (VOC) content not greater than required by South Coast Air Quality Management District Rule No.1168 and less where required by code.
3. Products are specified in multiple Sections throughout these Specifications.

B. Composite Wood Products: Comply with CALGreen Section 5.504 and Table 5.504.4.5 formaldehyde limits for hardwood plywood, particleboard, and medium density fiberboard composite wood products used on the interior and exterior of the building.

1. Verification of Compliance: Acceptable types are:
 - a. Certification by manufacturer that product complies with requirements.
 - b. Published product data showing compliance with requirements.
 - c. Chain of custody certifications.
 - d. Product labeled and invoiced as meeting the Composite Wood Products regulation (CCR, Title 17, Section 93120, et seq.).
 - e. Products marked as meeting the PS-1 or PS-2 standards of the Engineered Wood Association, the Australian AS/NZS 2269, or European 636 3S standards.
 - f. Other method acceptable to enforcing agency.

Table 5.504.4.5 FORMALDEHYDE LIMITS	
Maximum Formaldehyde Emissions in Parts per Million	
Product	Current Limit
Hardwood plywood veneer core	0.05
Hardwood plywood composite core	0.05
Particleboard	0.09
Medium density fiberboard	0.11
Thin medium density fiberboard ¹	0.13
Note 1: Thin medium density fiberboard has a maximum thickness of 5/16 inch (8 mm).	

C. Joint Sealants: Comply with CALGreen Section 5.504 and Table 5.504.4.2.

1. Verification of Compliance: Acceptable types are:
 - a. Report of laboratory testing performed in accordance with requirements.
 - b. Published product data showing compliance with requirements.

VOLATILE ORGANIC COMPOUND (VOC) RESTRICTIONS
SECTION 01 6116
3595001

- c. Certification by manufacturer that product complies with requirements.
- 2. Products used shall comply with the following limits.

Table 5.504.4.2 SEALANT VOC LIMIT	
Less Water and Less Exempt Compounds in Grams per Liter	
Sealant	Current VOC Limit
Architectural	250
Marine Deck	760
Non-Membrane Roof	300
Roadway	250
Single-Ply Roof Membrane	450
Other	420
Sealant Primers	Current VOC Limit
Architectural	
Non-Porous	250
Porous	775
Modified Bituminous	500
Marine Deck	760
Other	750
For low-solid adhesives or sealants the VOC limit is expressed in grams per liter of material; for all other adhesives and sealants, VOC limits are expressed as grams of VOC per liter of adhesive or sealant less water and less exempt compounds.	

- D. Paints and Coatings: Comply with CALGreen Section 5.504 and Table 5.504.4.3 based on the California Air Resources Board, Architectural Coatings Suggested Control Measure.
 - 1. Determination of VOC Content: Testing and calculation in accordance with 40 CFR 59, Subpart D (EPA Method 24), exclusive of colorants added to a tint base and water added at Project site; or other method acceptable to authorities having jurisdiction.
 - a. Verification of Compliance: Acceptable types are:
 - 1) Report of laboratory testing performed in accordance with requirements.
 - 2) Published product data showing compliance with requirements.
 - 3) Certification by manufacturer that product complies with requirements.
 - 2. Provide coatings that comply with the most stringent requirements specified in the following:
 - a. 40 CFR 59, Subpart D--National Volatile Organic Compound Emission Standards for Architectural Coatings.
 - b. South Coast Air Quality Management District Rule No.1168.
 - 3. Products used shall comply with the following limits.

VOLATILE ORGANIC COMPOUND (VOC) RESTRICTIONS
SECTION 01 6116
3595001

Table 5.504.4.3 VOC CONTENT LIMITS FOR ARCHITECTURAL COATINGS (See Notes 2 & 3 below)	
Grams of VOC per Liter of Coating, less water and less exempt compounds	
Coating Category	Current VOC Limit 1/1/2012
Flat Coatings	50
Non-Flat Coatings	100
Non-Flat High Gloss Coatings	150
Specialty Coatings	
Aluminum Roof Coatings	400
Basement Specialty Coatings	400
Bituminous Roof Coatings	50
Bituminous Roof Primers	350
Bond Breakers	350
Concrete Curing Compounds	350
Concrete / Masonry Sealers	100
Driveway Sealers	50
Dry Fog Coatings	150
Faux Finishing Coatings	350
Fire Resistive Coatings	350
Floor Coatings	100
Form-Release Compounds	250
Graphic Arts Coatings (Sign Paints)	500
High-Temperature Coatings	420
Industrial Maintenance Coatings	250
Low Solids Coatings (See Note 1 below)	120
Magnesite Cement Coatings	450
Mastic Texture Coatings	100
Metallic Pigmented Coatings	500
Multicolor Coatings	250
Pretreatment Wash Primers	420
Primers, Sealers and Undercoaters	100
Reactive Penetrating Sealers	350
Recycled Coatings	250
Roof Coatings	50
Rust Preventative Coatings	250
Shellacs:	
Clear	730
Opaque	550
Specialty Primers, Sealers and Undercoaters	100
Stains	250
Stone Consolidants	450
Swimming Pool Coatings	340
Traffic Marking Coatings	100
Waterproofing Membranes	250
Wood Coatings	275

VOLATILE ORGANIC COMPOUND (VOC) RESTRICTIONS
SECTION 01 6116
3595001

Table 5.504.4.3 VOC CONTENT LIMITS FOR ARCHITECTURAL COATINGS (See Notes 2 & 3 below)	
Grams of VOC per Liter of Coating, less water and less exempt compounds	
Coating Category	Current VOC Limit 1/1/2012
Wood Preservatives	350
Zinc Rich Primers	340
Note 1: Grams of VOC per liter of coating including water and including exempt compounds	
Note 2: Not Applicable	
Note 3: Values in this table are derived from those specified by the California Air Resources Board, Architectural Coatings Suggested Control Measure, February 1, 2008. More information is available from the Air Resources Board.	

4. Restricted Components: In addition to the specified VOC limits, paints and coatings shall not contain any of the following:
- Acrolein.
 - Acrylonitrile.
 - Antimony.
 - Benzene.
 - Butyl benzyl phthalate.
 - Cadmium.
 - Di (2-ethylhexyl) phthalate.
 - Di-n-butyl phthalate.
 - Di-n-octyl phthalate.
 - 1,2-dichlorobenzene.
 - Diethyl phthalate.
 - Dimethyl phthalate.
 - Ethylbenzene.
 - Formaldehyde.
 - Hexavalent chromium.
 - Isophorone.
 - Lead.
 - Mercury.
 - Methyl ethyl ketone.
 - Methyl isobutyl ketone.
 - Methylene chloride.
 - Naphthalene.
 - Toluene (methylbenzene).
 - 1,1,1-trichloroethane.

- y. Vinyl chloride.

PART 3 - EXECUTION

3.1 FIELD QUALITY CONTROL

- A. Owner reserves the right to reject non-compliant products, whether installed or not, and require their removal and replacement with compliant products at no extra cost to Owner.
- B. Additional costs to restore indoor air quality, including fines by authorities, due to installation of non-compliant products shall be borne by Contractor.

3.2 CERTIFICATION FORM

- A. Use of this Form:
 - 1. Because installers are allowed and directed to choose accessory materials suitable for the applicable installation, there is a possibility that such accessory materials might contain VOC content in excess of that permitted, especially where such materials have not been explicitly specified.
 - 2. Contractor is required to obtain and submit this Form from each installer of work on this project.
 - 3. For each product category listed, circle the correct words in brackets: either [HAS] or [HAS NOT].
 - 4. If these accessory materials have been used, attach to this form product data and MSDS sheet for each such product.

(The Remainder of this Page is Intentionally Left Blank)

VOLATILE ORGANIC COMPOUND (VOC) RESTRICTIONS
SECTION 01 6116
3595001

ACCESSORY MATERIAL VOC CONTENT CERTIFICATION FORM

IDENTIFICATION:

Project Name: _____

Project No.: _____

Architect: _____

PRODUCT CERTIFICATION: I certify that the installation work of my firm on this project:

1. [HAS] [HAS NOT] required the use of any ADHESIVES.
2. [HAS] [HAS NOT] required the use of any JOINT SEALANTS.
3. [HAS] [HAS NOT] required the use of any PAINTS OR COATINGS.
4. [HAS] [HAS NOT] required the use of any COMPOSITE WOOD or AGRIFIBER PRODUCTS.

Product data and MSDS sheets are attached.

CERTIFIED BY (Installer/Manufacturer/Supplier Firm):

Firm Name: _____

Print Name: _____

Signature: _____

Title: _____ (officer of company)

Date: _____

END OF SECTION

*p:\sacramento\3595 tracy unified school district\001-000_villalovoz es new shade structures\08 specifications\06 spec\04
final\bohn\01 6116.10_volatile organic compound (voc) restrictions.docx
Last Updated: January 18, 2022*

SECTION 01 66 00

PRODUCT DELIVERY, STORAGE AND HANDLING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Site Access, Conditions and Requirements;
- B. Special Conditions.

1.02 PRODUCTS

- A. Products are as defined in the General Conditions.
- B. Contractor shall not use and/or reuse materials and/or equipment removed from existing Premises, except as specifically permitted by the Contract Documents.
- C. Contractor shall provide interchangeable components of the same manufacturer, for similar components.

1.03 TRANSPORTATION AND HANDLING

- A. Contractor shall transport and handle Products in accordance with manufacturer's instructions.
- B. Contractor shall promptly inspect shipments to confirm that Products comply with requirements, quantities are correct, and products are undamaged.
- C. Contractor shall provide equipment and personnel to handle Products by methods to prevent soiling, disfigurement, or damage.

1.04 STORAGE AND PROTECTION

- A. Contractor shall store and protect Products in accordance with manufacturer's instructions, with seals and labels intact and legible. Contractor shall store sensitive products in weather-tight, climate controlled enclosures.
- B. For exterior storage of fabricated Products, Contractor shall place on sloped supports, above ground.
- C. Contractor shall provide off-site storage and protection when Site does not permit on-site storage or protection.

- D. Contractor shall cover products subject to deterioration with impervious sheet covering and provide ventilation to avoid condensation.
- E. Contractor shall store loose granular materials on solid flat surfaces in a well-drained area and prevent mixing with foreign matter.
- F. Contractor shall provide equipment and personnel to store Products by methods to prevent soiling, disfigurement, or damage.
- G. Contractor shall arrange storage of Products to permit access for inspection and periodically inspect to assure Products are undamaged and are maintained under specified conditions.

PART 2 – PRODUCTS Not Used.

PART 3 - EXECUTION Not Used.

END OF DOCUMENT

CUTTING AND PATCHING

PART 1 – GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Inspector, Inspections, and Tests, Integration of Work, Nonconforming Work, and Correction of Work, and Uncovering Work;
- B. Special Conditions;
- C. Imported Materials Certification.

1.02 CUTTING AND PATCHING:

- A. Contractor shall be responsible for all cutting, fitting, and patching, including associated excavation and backfill, required to complete the Work or to:
 - (1) Make several parts fit together properly.
 - (2) Uncover portions of Work to provide for installation of ill-timed Work.
 - (3) Remove and replace defective Work.
 - (4) Remove and replace Work not conforming to requirements of Contract Documents.
 - (5) Remove Samples of installed Work as specified for testing.
 - (6) Provide routine penetrations of non-structural surfaces for installation of piping and electrical conduit.
 - (7) Attaching new materials to existing remodeling areas – including painting (or other finishes) to match existing conditions.
- B. In addition to Contract requirements, upon written instructions from the District, Contractor shall uncover Work to provide for observations of covered Work in accordance with the Contract Documents; remove samples of installed materials for testing as directed by District; and remove Work to provide for alteration of existing Work.
- C. Contractor shall not cut or alter Work, or any part of it, in such a way that endangers or compromises the integrity of the Work, the Project, or work of others.

1.03 SUBMITTALS:

- A. Prior to any cutting or alterations that may affect the structural safety of Project, or work of others, and well in advance of executing such cutting or alterations, Contractor shall submit written notice to District pursuant to the applicable notice provisions of the Contract Documents, requesting consent to proceed with the cutting or alteration, including the following:
 - (1) The work of the District or other trades.
 - (2) Structural value or integrity of any element of Project.
 - (3) Integrity or effectiveness of weather-exposed or weather-resistant elements or systems.
 - (4) Efficiency, operational life, maintenance or safety of operational elements.
 - (5) Visual qualities of sight-exposed elements.
- B. Contractor's Request shall also include:
 - (1) Identification of Project.
 - (2) Description of affected Work.
 - (3) Necessity for cutting, alteration, or excavations.
 - (4) Effects of Work on District, other trades, or structural or weatherproof integrity of Project.
 - (5) Description of proposed Work:
 - (a) Scope of cutting, patching, alteration, or excavation.
 - (b) Trades that will execute Work.
 - (c) Products proposed to be used.
 - (d) Extent of refinishing to be done.
 - (6) Alternates to cutting and patching.
 - (7) Cost proposal, when applicable.
 - (8) The scheduled date the Contractor intends to perform the Work and the duration of time to complete the Work.
 - (9) Written permission of District or other District contractor(s) whose work will be affected.

1.04 QUALITY ASSURANCE:

- A. Contractor shall ensure that cutting, fitting, and patching shall achieve security, strength, weather protection, appearance for aesthetic match, efficiency, operational life, maintenance, safety of operational elements, and the continuity of existing fire ratings.
- B. Contractor shall ensure that cutting, fitting, and patching shall successfully duplicate undisturbed adjacent profiles, materials, textures, finishes, colors, and that materials shall match existing construction. Where there is dispute as to whether duplication is successful or has been achieved to a reasonable degree, the District's decision shall be final.

1.05 PAYMENT FOR COSTS:

- A. Cost caused by ill-timed or defective Work or Work not conforming to Contract Documents, including costs for additional services of the District, its consultants, including but not limited to the Construction Manager, the Architect, the Project Inspector(s), Engineers, and Agents, will be paid by Contractor and/or deducted from the Contract by the District.
- B. District shall only pay for cost of Work if it is part of the original Contract Price or if a change has been made to the contract in compliance with the provisions of the General Conditions. Cost of Work performed upon instructions from the District, other than defective or nonconforming Work, will be paid by District on approval of written Change Order. Contractor shall provide written cost proposals prior to proceeding with cutting and patching.

PART 2 - PRODUCTS

2.01 MATERIALS:

- A. Contractor shall provide for replacement and restoration of Work removed. Contractor shall comply with the Contract Documents and with the Industry Standard(s), for the type of Work, and the Specification requirements for each specific product involved. If not specified, Contractor shall first recommend a product of a manufacturer or appropriate trade association for approval by the District.
- B. Materials to be cut and patched include those damaged by the performance of the Work.

PART 3 – EXECUTION

3.01 INSPECTION:

- A. Contractor shall inspect existing conditions of the Site and the Work, including elements subject to movement or damage during cutting and patching, excavating and backfilling. After uncovering Work, Contractor shall inspect conditions affecting installation of new products.

- B. Contractor shall report unsatisfactory or questionable conditions in writing to District as indicated in the General Conditions and shall proceed with Work as indicated in the General Conditions by District.

3.02 PREPARATION:

- A. Contractor shall provide shoring, bracing and supports as required to maintain structural integrity for all portions of the Project, including all requirements of the Project.
- B. Contractor shall provide devices and methods to protect other portions of Project from damage.
- C. Contractor shall, provide all necessary protection from weather and extremes of temperature and humidity for the Project, including without limitation, any work that may be exposed by cutting and patching Work. Contractor shall keep excavations free from water.

3.03 ERECTION, INSTALLATION AND APPLICATION:

- A. With respect to performance, Contractor shall:
 - (1) Execute fitting and adjustment of products to provide finished installation to comply with and match specified tolerances and finishes.
 - (2) Execute cutting and demolition by methods that will prevent damage to other Work, and provide proper surfaces to receive installation of repairs and new Work.
 - (3) Execute cutting, demolition excavating, and backfilling by methods that will prevent damage to other Work and damage from settlement.
- B. Contractor shall employ original installer or fabricator to perform cutting and patching for:
 - (1) Sight-exposed finished surfaces.
- C. Contractor shall execute fitting and adjustment of products to provide a finished installation to comply with specified products, functions, tolerances, and finishes as shown or specified in the Contract Documents including, without limitation, the Drawings and Specifications.
- D. Contractor shall fit Work airtight to pipes, sleeves, conduit, and other penetrations through surfaces. Contractor shall conform to all Code requirements for penetrations or the Drawings and Specifications, whichever calls for a higher quality or more thorough requirement. Contractor shall maintain integrity of both rated and non-rated fire walls, ceilings, floors, etc.
- E. Contractor shall restore Work which has been cut or removed. Contractor shall install new products to provide completed Work in accordance with requirements of the Contract Documents and as required to match surrounding areas and surfaces.

- F. Contractor shall refinish all continuous surfaces to nearest intersection as necessary to match the existing finish to any new finish.

END OF DOCUMENT

ALTERATION PROJECT PROCEDURES

PART 1 – GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Integration of Work, Purchase of Materials and Equipment, Uncovering of Work and Non-conforming Work and Correction of Work and Trenches;
- B. Special Conditions.

PART 2 - PRODUCTS

2.01 PRODUCTS FOR PATCHING AND EXTENDING WORK:

- A. New Materials: As specified in the Contract Documents including, without limitation, in the Specifications, Contractor shall match existing products, conditions, and work for patching and extending work.
- B. Type and Quality of Existing Products: Contractor shall determine by inspection, by testing products where necessary, by referring to existing conditions and to the Work as a standard.

PART 3 - EXECUTION

3.01 EXAMINATION:

- A. Contractor shall verify that demolition is complete and that areas are ready for installation of new Work.
- B. By beginning restoration Work, Contractor acknowledges and accepts the existing conditions.

3.02 PREPARATION:

- A. Contractor shall cut, move, or remove items as necessary for access to alterations and renovation Work. Contractor shall replace and restore these at completion.
- B. Contractor shall remove unsuitable material not as salvage unless otherwise indicated in the Contract Documents. Unsuitable material may include, without limitation, rotted wood, corroded metals, and deteriorated masonry and concrete. Contractor shall replace materials as specified for finished Work.

- C. Contractor shall remove debris and abandoned items from all areas of the Site and from concealed spaces.
- D. Contractor shall prepare surface and remove surface finishes to provide for proper installation of new Work and finishes.

3.03 INSTALLATION:

- A. Contractor shall coordinate Work of all alternations and renovations to expedite completion and to accommodate District occupancy.
- B. Designated Areas and Finishes: Contractor shall complete all installations in all respects, including operational, and electrical work.
- C. Contractor shall remove, cut, and patch Work in a manner to minimize damage and to provide a means of restoring Products and finishes to original or specified condition.
- D. Contractor shall refinish visible existing surfaces to remain to specified condition for each material, with a neat and square or straight transition to adjacent finishes.
- E. Contractor shall install products as specified in the Contract Documents, including without limitation, the Specifications.

3.04 TRANSITIONS:

- A. Where new Work abuts or aligns with existing, Contractor shall perform a smooth and even transition. Patched Work must match existing adjacent work in texture and appearance.
- B. When finished surfaces are cut so that a smooth transition with new Work is not possible, Contractor shall terminate existing surface along a straight line at a natural line of division and make a recommendation for resolution to the District and the Architect for review and approval.

3.05 ADJUSTMENTS:

- A. Where a change of plane of 1/4 inch or more occurs, Contractor shall submit a recommendation for providing a smooth transition to the District and the Architect for review and approval.
- B. Contractor shall fit Work at penetrations of surfaces.

3.06 REPAIR OF DAMAGED SURFACES:

- A. Contractor shall patch or replace portions of existing surfaces, which are damaged, lifted, discolored, or showing other imperfections, in the area where the Work is performed.
- B. Contractor shall repair substrate prior to patching finish.

3.07 CULTIVATED AREAS AND OTHER SURFACE IMPROVEMENTS:

- A. Cultivated or planted areas and other surface improvements which are damaged by actions of the Contractor shall be restored by Contractor to their original condition or better, where indicated.
- B. Contractor shall protect and replace, if damaged, all existing guard posts, barricades, and fences.
- C. Contractor shall give special attention to avoid damaging or killing trees, bushes and/or shrubs on the Premises and/or identified in the Contract Documents, including without limitation, the Drawings.

3.08 FINISHES:

- A. Contractor shall finish surfaces as specified in the Contract Documents, including without limitations, the provisions of all Divisions of the Specifications.
- B. Contractor shall finish patches to produce uniform finish and texture over entire area. When finish cannot be matched, Contractor shall refinish entire surface to nearest intersections.

3.09 CLEANING:

- A. Contractor shall continually clean the Site and the Premises as indicated in the Contract Documents, including without limitation, the provisions in the General Conditions and the Specifications regarding cleaning.

END OF DOCUMENT

CONTRACT CLOSEOUT AND FINAL CLEANING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Completion of Work;
- B. Special Conditions;
- C. Temporary Facilities and Controls.

1.02 CLOSEOUT PROCEDURES

Contractor shall comply with all closeout provisions as indicated in the General Conditions.

1.03 FINAL CLEANING

- A. Contractor shall execute final cleaning prior to final inspection.
- B. Contractor shall clean interior and exterior glass and all surfaces exposed to view; remove temporary labels, tape, stains, and foreign substances, polish transparent and glossy surfaces, wax and polish new vinyl floor surfaces, vacuum carpeted and soft surfaces.
- C. Contractor shall clean equipment and fixtures to a sanitary condition.
- D. Contractor shall replace filters of operating equipment.
- E. Contractor shall clean debris from roofs, gutters, down spouts, and drainage systems.
- F. Contractor shall clean Site, sweep paved areas, and rake clean landscaped surfaces.
- G. Contractor shall remove waste and surplus materials, rubbish, and construction facilities from the Site and surrounding areas.

1.04 ADJUSTING

Contractor shall adjust operating products and equipment to ensure smooth and unhindered operation.

1.05 RECORD DOCUMENTS AND SHOP DRAWINGS

- A. Contractor shall legibly mark each item to record actual construction, including:
 - (1) Measured depths of foundation in relation to finish floor datum.
 - (2) Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permit surface improvements.
 - (3) Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.
 - (4) Field changes of dimension and detail.
 - (5) Details not on original Contract Drawings
 - (6) Changes made by modification(s).
 - (7) References to related Shop Drawings and modifications.
- B. Contractor will provide one set of Record Drawings to District.
- C. Contractor shall submit all required documents to District and/or Architect prior to or with its final Application for Payment.

1.06 INSTRUCTION OF DISTRICT PERSONNEL

- A. Before final inspection, at agreed upon times, Contractor shall instruct District's designated personnel in operation, adjustment, and maintenance of products, equipment, and systems.
- B. For equipment requiring seasonal operation, Contractor shall perform instructions for other seasons within six months or by the change of season.
- C. Contractor shall use operation and maintenance manuals as basis for instruction. Contractor shall review contents of manual with personnel in detail to explain all aspects of operation and maintenance.
- D. Contractor shall prepare and insert additional data in Operation and Maintenance Manual when the need for such data becomes apparent during instruction.
- E. Contractor shall review contents of manual with personnel in detail to explain all aspects of operation and maintenance.

1.07 SPARE PARTS AND MAINTENANCE MATERIALS

- A. Contractor shall provide products, spare parts, maintenance, and extra materials in quantities specified in the Specifications and in Manufacturer's recommendations.

- B. Contractor shall provide District with all required Operation and Maintenance Data at one time. Partial or piecemeal submissions of Operation and Maintenance Data will not be accepted.

PART 2 – PRODUCTS Not Used.

PART 3 – EXECUTION Not Used.

END OF DOCUMENT

OPERATION AND MAINTENANCE DATA

PART 1 – GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Completion of the Work;
- B. Special Conditions.

1.02 QUALITY ASSURANCE:

Contractor shall prepare instructions and data by personnel experienced in maintenance and operation of described products.

1.03 FORMAT:

- A. Contractor shall prepare data in the form of an instructional manual entitled "OPERATIONS AND MAINTENANCE MANUAL & INSTRUCTIONS" ("Manual").
- B. Binders: Contractor shall use commercial quality, 8-1/2 by 11 inch, three-side rings, with durable plastic covers; two inch maximum ring size. When multiple binders are used, Contractor shall correlate data into related consistent groupings.
- C. Cover: Contractor shall identify each binder with typed or printed title "OPERATION AND MAINTENANCE MANUAL & INSTRUCTIONS"; and shall list title of Project and identify subject matter of contents.
- D. Contractor shall arrange content by systems process flow under section numbers and sequence of Table of Contents of the Contract Documents.
- E. Contractor shall provide tabbed fly leaf for each separate product and system, with typed description of product and major component parts of equipment.
- F. Text: The content shall include Manufacturer's printed data, or typewritten data on 24 pound paper.
- G. Drawings: Contractor shall provide with reinforced punched binder tab and shall bind in with text; folding larger drawings to size of text pages.

1.04 CONTENTS, EACH VOLUME:

- A. Table of Contents: Contractor shall provide title of Project; names, addresses, and telephone numbers of the Architect, any engineers, subconsultants, Subcontractor(s), and Contractor with name of responsible parties; and schedule of products and systems, indexed to content of the volume.

- B. For Each Product or System: Contractor shall list names, addresses, and telephone numbers of Subcontractor(s) and suppliers, including local source of supplies and replacement parts.
- C. Product Data: Contractor shall mark each sheet to clearly identify specific products and component parts, and data applicable to installation. Delete inapplicable information.
- D. Drawings: Contractor shall supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams. Contractor shall not use Project Record Documents as maintenance drawings.
- E. Text: Contractor shall include any and all information as required to supplement product data. Contractor shall provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions.
- F. Warranties and Bonds: Contractor shall bind in one copy of each.

1.05 MANUAL FOR MATERIALS AND FINISHES:

- A. Building Products, Applied Materials, and Finishes: Contractor shall include product data, with catalog number, size, composition, and color and texture designations. Contractor shall provide information for re-ordering custom manufactured products.
- B. Instructions for Care and Maintenance: Contractor shall include Manufacturer's recommendations for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.
- C. Moisture Protection and Weather Exposed Products: Contractor shall include product data listing applicable reference standards, chemical composition, and details of installation. Contractor shall provide recommendations for inspections, maintenance, and repair.
- D. Additional Requirements: Contractor shall include all additional requirements as specified in the Specifications.
- E. Contractor shall provide a listing in Table of Contents for design data, with tabbed fly sheet and space for insertion of data.

1.06 MANUAL FOR EQUIPMENT AND SYSTEMS:

- A. Each Item of Equipment and Each System: Contractor shall include description of unit or system, and component parts and identify function, normal operating characteristics, and limiting conditions. Contractor shall include performance curves, with engineering data and tests, and complete nomenclature, and commercial number of replaceable parts.
- B. Panelboard Circuit Directories: Contractor shall provide electrical service characteristics, controls, and communications.

- C. Contractor shall include color coded wiring diagrams as installed.
- D. Operating Procedures: Contractor shall include start-up, break-in, and routine normal operating instructions and sequences. Contractor shall include regulation, control, stopping, shut-down, and emergency instructions. Contractor shall include summer, winter, and any special operating instructions.
- E. Maintenance Requirements: Contractor shall include routine procedures and guide for trouble-shooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.
- F. Contractor shall provide servicing and lubrication schedule, and list of lubricants required.
- G. Contractor shall include manufacturer's printed operation and maintenance instructions.
- H. Contractor shall include sequence of operation by controls manufacturer.
- I. Contractor shall provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.
- J. Contractor shall provide control diagrams by controls manufacturer as installed.
- K. Contractor shall provide Contractor's coordination drawings, with color coded piping diagrams as installed.
- L. Contractor shall provide charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams.
- M. Contractor shall provide list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.
- N. Additional Requirements: Contractor shall include all additional requirements as specified in Specification(s).
- O. Contractor shall provide a listing in Table of Contents for design data, with tabbed fly sheet and space for insertion of data.

1.07 SUBMITTAL:

- A. Contractor shall submit to the District for review two (2) copies of preliminary draft or proposed formats and outlines of the contents of the Manual within thirty (30) days of Contractor's start of Work.
- B. For equipment, or component parts of equipment put into service during construction and to be operated by District, Contractor shall submit draft content for that portion of the Manual within ten (10) days after acceptance of that equipment or component.

- C. Contractor shall submit two (2) copies of a complete Manual in final form prior to final Application for Payment. Copy will be returned with Architect/Engineer comments. Contractor must revise the content of the Manual as required by District prior to District's approval of Contractor's final Application for Payment.
- D. Contractor must submit two (2) copies of revised Manual in final form within ten (10) days after final inspection.

PART 2 – PRODUCTS Not Used.

PART 3 – EXECUTION Not Used.

END OF DOCUMENT

WARRANTIES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Warranty/Guarantee Information;
- B. Special Conditions.

1.02 FORMAT

- A. Binders: Contractor shall use commercial quality, 8-1/2 by 11 inch, three-side rings, with durable plastic covers; two inch maximum ring size.
- B. Cover: Contractor shall identify each binder with typed or printed title "WARRANTIES" and shall list title of Project.
- C. Table of Contents: Contractor shall provide title of Project; name, address, and telephone number of Contractor and equipment supplier; and name of responsible principal. Contractor shall identify each item with the number and title of the specific Specification, document, provision, or section in which the name of the product or work item is specified.
- D. Contractor shall separate each warranty with index tab sheets keyed to the Table of Contents listing, providing full information and using separate typed sheets as necessary. Contractor shall list each applicable and/or responsible Subcontractor(s), supplier(s), and/or manufacturer(s), with name, address, and telephone number of each responsible principal(s).

1.03 PREPARATION:

- A. Contractor shall obtain warranties, executed in duplicate by each applicable and/or responsible subcontractor(s), supplier(s), and manufacturer(s), within ten (10) days after completion of the applicable item or work. Except for items put into use with District's permission, Contractor shall leave date of beginning of time of warranty blank until the date of completion is determined.
- B. Contractor shall verify that documents are in proper form, contain full information, and are notarized, when required.
- C. Contractor shall co-execute submittals when required.
- D. Contractor shall retain warranties until time specified for submittal.

1.04 TIME OF SUBMITTALS:

- A. For equipment or component parts of equipment put into service during construction with District's permission, Contractor shall submit a draft warranty for that equipment or component within ten (10) days after acceptance of that equipment or component.
- B. Contractor shall submit for District approval all warranties and related documents within ten (10) days after date of completion. Contractor must revise the warranties as required by the District prior to District's approval of Contractor's final Application for Payment.
- C. For items of work delayed beyond date of completion, Contractor shall provide an updated submittal within ten (10) days after acceptance, listing the date of acceptance as start of warranty period.

PART 2 - PRODUCTS Not Used.

PART 3 – EXECUTION Not Used.

END OF DOCUMENT

(Letterhead of Contractor)

STANDARD GUARANTEE / WARRANTY

for

Project Name

Contract No.

We hereby warrant that the Work we have provided under the above reference Contract has been completed in accordance with the Drawings, Specifications, and other Contract Documents.

Under the terms of this warranty, we agree to repair or replace any or all of our work, together with any other adjacent work which may be displaced or damaged by so doing, which may prove to be either patently defective in its workmanship or latently defective in its workmanship or materials within the period of 24 months from the date of filing of the Notice of Completion of the above named Project by the Board of Trustees of the School District, and we also agree to repair any and all damages resulting from such defects, without any expense whatsoever to said Board of Trustees, ordinary wear and tear and unusual abuse or neglect excepted.

In the event of our failure to comply with above-mentioned guarantee conditions within ten (10) day after being notified in writing by the Owner, we collectively and separately do hereby authorize the Owner to have said defective work and damages repaired or replaced and made good at our expense and will honor and pay the costs and charges therefore upon demand.

SIGNED (Contractor) _____

(Address)

(Printed Name of Authorized Representative)

Signature

(License Number)

(Date of Signing)

COUNTERSIGNED (Owner) _____

(Printed Name of Authorized Representative)

Signature

Date of Filing or Notice of Completion: _____

(Letterhead of Company)

SUBCONTRACTOR STANDARD GUARANTEE / WARRANTY

We hereby warrant that

which we have provided in _____

Name of Project _____

for

District

has been completed in accordance with Specification Section _____ and requirements of the Contract Documents.

Under the terms of this warranty, we agree to repair or replace any or all of our work, together with any other adjacent work which may be displaced or damaged by so doing, which may prove to be either patently defective in its workmanship or latently defective in its workmanship or materials within a period of 24 months from date of filing the Notice of Completion of the above-named Project by the Board of Trustees of the School District without any expense whatsoever to said Board of Trustees, ordinary wear and tear and unusual abuse or neglect excepted.

In the event of our failure to comply with above-mentioned guarantee conditions within ten (10) day after being notified in writing by the Owner, we collectively and separately do hereby authorize the Owner to have said defective work and damages repaired or replaced and made good at our expense and will honor and pay the costs and charges therefore upon demand.

SIGNED (Subcontractor)

(Signature)

(Company Name)

(Address)

(License Number) (Date of Signing)

(License Number) (Date of Signing)

COUNTERSIGNED (General Contractor)

(Signature)

(Company Name)

(Address)

(License Number) (Date of Signing)

(License Number) (Date of Signing)

(Letterhead of Company)

SPECIAL EXTENDED WRITTEN GUARANTEE / WARRANTY

We hereby warrant that

which we have provided in _____

Name of Project

for _____

District

has been completed in accordance with Specification Section _____ and requirements of the Contract Documents.

Under the terms of this warranty, we agree to repair or replace any or all of our work, together with any other adjacent work which may be displaced or damaged by so doing, which may prove to be either patently defective in its workmanship or latently defective in its workmanship or materials within a period of _____ year(s) from date of filing the Notice of Completion of the above-named Project by the Board of Trustees of the School District without any expense whatsoever to said Board of Trustees, ordinary wear and tear and unusual abuse or neglect excepted. We also agree to repair any and all damages resulting from such defects.

In the event of our failure to comply with above-mentioned conditions within a reasonable time but in no case longer than ten (10) calendar days after being notified in writing by the Owner, we collectively and separately do hereby authorize the Owner to have said defective work and damages repaired or replaced and made good at our expense and will honor and pay the costs and charges therefore upon demand.

SIGNED (Subcontractor)

(Name)

(Address)

(License Number)

(Date of Signing)

COUNTERSIGNED (General Contractor)

(Name)

(Address)

(License Number)

(Date of Signing)

RECORD DOCUMENTS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Documents on Work;
- B. Special Conditions.

PART 2 - RECORD DRAWINGS

2.01 GENERAL:

- A. As indicated in the Contract Documents, the District will provide Contractor with one set of reproducible, full size original Contract Drawings (mylars).
- B. Contractor shall maintain at each Project Site one set of marked-up plans and shall transfer all changes and information to those marked-up plans, as often as required in the Contract Documents, but in no case less than once each month. Contractor shall submit to the Project Inspector one set of reproducible vellums of the Project Record Drawings ("As-Built") showing all changes incorporated into the Work since the preceding monthly submittal. The As-Built shall be available at the Project Site. The Contractor shall submit reproducible vellums at the conclusion of the Project following review of the blue line prints.
- C. Label and date each Record Drawing "RECORD DOCUMENT" in legibly printed letters.
- D. All deviations in construction, including but not limited to pipe and conduit locations and deviations caused by without limitation Change Orders, Construction Claim Directives, RFI's, and Addenda, shall be accurately and legibly recorded by Contractor.
- E. Locations and changes shall be done by Contractor in a neat and legible manner and, where applicable, indicated by drawing a "cloud" around the changed or additional information.

2.02 RECORD DRAWING INFORMATION:

- A. Contractor shall record the following information:
 - (1) Locations of Work buried under or outside each building, including, without limitation, all utilities, plumbing and electrical lines, and conduits.

- (2) Actual numbering of each electrical circuit to match panel schedule.
- (3) Locations of significant Work concealed inside each building whose general locations are changed from those shown on the Contract Drawings.
- (4) Locations of all items, not necessarily concealed, which vary from the Contract Documents.
- (5) Installed location of all cathodic protection anodes.
- (6) Deviations from the sizes, locations, and other features of installations shown in the Contract Documents.
- (7) Locations of underground work, points of connection with existing utilities, changes in direction, valves, manholes, catch basins, capped stubouts, invert elevations, etc.
- (8) Sufficient information to locate Work concealed in each building with reasonable ease and accuracy.

In some instances, this information may be recorded by dimension. In other instances, it may be recorded in relation to the spaces in the building near which it was installed.

- B. Contractor shall provide additional drawings as necessary for clarification.
- C. Contractor shall provide reproducible record drawings, made from final Shop Drawings marked "No Exceptions Taken" or "Approved as Noted."
- D. After review and approval of the marked-up specifications by the Project Inspector, Contractor shall provide electronic copies of the drawings (in PDF format) with one file with all of the sheets and one set of individual sheet files at the conclusion of the Project.

PART 3 - RECORD SPECIFICATIONS

3.01 GENERAL:

- A. Contractor shall mark each section legibly to record manufacturer, trade name, catalog number, and supplier of each Product and item of equipment actually installed.
- B. After review and approval of the marked-up specifications by the Project Inspector, Contractor shall provide one electronic copy of the specifications (in PDF format) at the conclusion of the Project.

PART 4 - MAINTENANCE OF RECORD DOCUMENTS

4.01 GENERAL

- A. Contractor shall store Record Documents apart from documents used for construction as follows:

- (1) Provide files and racks for storage of Record Documents.
- (2) Maintain Record Documents in a clean, dry, legible condition and in good order.

B. Contractor shall not use Record Documents for construction purposes.

PART 5 – PRODUCTS Not Used.

END OF DOCUMENT

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes general requirements and procedures for compliance with California Code of Regulations, Title 24, Part 11 California Green Building Standards Code, "CAL-Green".

- 1. Chapter 5- Non-Residential Mandatory Measures.

1.2 RELATED REQUIREMENTS

- A. Pertinent sections specifying erosion control.
- B. Section 01 6116, Volatile Organic Compound (VOC) Restrictions.
- C. Document 01 5013, Construction Waste Management and Disposal.
- D. Document 01 7700, Contract Closeout and Final Cleaning.

1.3 DEFINITIONS

- A. CAL-Green Definitions: Certain terms are defined by CAL-Green in Chapter 5 of the code. Words and terms used in this section shall have the meanings shown therein.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Respond to questions and requests from Architect and the jurisdiction having authority regarding CAL-Green credits that are the responsibility of the Contractor, that depend on product selection or product qualities, or that depend on Contractor's procedures. Document responses as informational submittals.

1.5 SUBMITTALS

- A. CAL-GREEN Submittals: Submit CAL-GREEN submittals required by code and in other Specification Sections.
 - 1. CAL-GREEN submittals are in addition to other submittals. If submitted item is identical to that submitted to comply with other requirements, submit duplicate copies as a separate submittal to verify compliance with indicated CAL-GREEN requirements.
 - 2. Acceptable verification submittals are specified in the related sections.

SUSTAINABLE DESIGN REQUIREMENTS
SECTION 01 8113
3595001

PART 2 - PRODUCTS

2.1 REQUIREMENTS - GENERAL

- A. Provide products and procedures necessary to confirm CAL-GREEN compliance required in this Section. Although other Sections may specify some CAL-GREEN requirements, the Contractor shall determine additional materials, techniques, means, methods and procedures necessary to comply with CAL-GREEN requirements.

2.2 STORM WATER POLLUTION PREVENTION PLAN

- A. Section 5.106.1: Comply with requirements of this code section, local ordinances, General Conditions, Special Provisions, and related sections specifying erosion control.

2.3 OUTDOOR WATER USE

- A. Section 5.304.3.1: Irrigation Controllers: Comply with requirements of this code section, local ordinances and Section 32 8000.

2.4 CONSTRUCTION WASTE REDUCTION

- A. Section 5.408 Construction Waste Management, Diversion and Recycling: Comply with requirements of this code section, local ordinances and Section 01 7419.

2.5 BUILDING MAINTENANCE AND OPERATION

- A. Section 5.410.2.3, 4. Commissioning and Functional Performance Testing: Participate in Commissioning and provide functional performance testing as required by these code sections and as specified in Section 01 9113.
- B. Section 5.410.2.5. Documentation and Training: Provide Operations Training as required by these code sections and as specified in Section 01 7700 and Systems Manual as specified in Section 01 7700.

2.6 POLLUTANT CONTROL

- A. Section 5.504.3 Indoor Air Quality: Comply with requirements of this code section, local ordinances.
- B. Section 5.504.4 Finish Material Pollutant Control: All Finish materials shall comply with requirements of this code section, local ordinances and Section 01 6116.

PART 3 - EXECUTION

3.1 GENERAL

- A. Comply with Document 01 5013, Construction Waste Management and Disposal.

SUSTAINABLE DESIGN REQUIREMENTS
SECTION 01 8113
3595001

- B. Comply with execution requirements of related sections and applicable local codes and ordinances.

END OF SECTION

*p:\sacramento\3595 tracy unified school district\001-000_villalovoz es new shade structures\08 specifications\06 spec\04
final\bohn\01 8113.10_sustainable design requirements (cal-green).docx
Last Updated: April 8, 2019*

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Sealants and backing for interior and exterior joints.

1.2 RELATED REQUIREMENTS

- A. Section 01 6116, Volatile Organic Compound (VOC) Restrictions, for VOC limits pertaining to adhesives, sealants, fillers, primers, and coatings.
- B. Section 01 8113, Sustainable Design Requirements, for CAL-Green general requirements and procedures.
- C. Pertinent Sections specifying sealants or referencing this Section for sealant products and installation requirements.
- ~~D. Section 07 8413, Penetration Firestopping, for sealing joints in fire resistance rated construction.~~

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on Drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CAL Green), edition as noted on Drawings, as adopted by the California Division of the State Architect (DSA).
- C. American Concrete Institute (ACI) Publications and Standards:
 - 1. ACI 302.1R: Guide to Concrete Floor and Slab Construction.
 - 2. ACI 360R-10: Guide to Design of Slabs-on-Ground.
- D. ASTM International (ASTM):
 - 1. C834: Standard Specification for Latex Sealants.
 - 2. C919: Standard Practice for Use of Sealants in Acoustical Applications.
 - 3. C920: Standard Specification for Elastomeric Joint Sealants.
 - 4. C1193: Standard Guide for Use of Joint Sealants.
 - 5. C1247: Standard Test Method for Durability of Sealants Exposed to Continuous Immersion in Liquids.
 - 6. C1248: Standard Test Method for Staining of Porous Substrate by Joint Sealants.
 - 7. C1311: Standard Specification for Solvent Release Sealants.
 - 8. C1330: Standard Specification for Cylindrical Sealant Backing for Use with Cold Liquid-Applied Sealants.

JOINT SEALANTS
SECTION 07 9200
3595001

9. C1521: Standard Practice for Evaluating Adhesion of Installed Weatherproofing Sealant Joints.
 10. D1667: Standard Specification for Flexible Cellular Materials - Poly (Vinyl Chloride) Foam (Closed-Cell).
 11. E90: Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements.
- E. Federal Specifications (FS):
1. FS TT-S-001657: Sealing Compound--Single Component, Butyl Rubber Based, Solvent Release Type.
- F. South Coast Air Quality Management District (SCAQMD):
1. Rule 1168: Adhesive and Sealant Applications.
- G. U.S. Food & Drug Administration (FDA):
1. Code of Federal Regulations: Title 21, 21 CFR 177.2600, Rubber Articles Intended for Repeated Use.

1.4 DEFINITIONS

- A. Sealant Terminology in accordance with ASTM C834 and ASTM C920:
1. Type C: Clear / translucent sealant.
 2. Type OP: Opaque pigmented sealant.
 3. Type S: Single component sealant.
 4. Type M: Sealant with two or more components.
 5. Grade NS: Nonsag sealant.
 6. Grade P: Pourable sealant.
 7. Grade -18°C: Sealant with low temperature flexibility tested to -18°C (0°F).
 8. Grade 0°C: Sealant with low temperature flexibility tested to 0°C (32°F).
 9. Grade NF: Sealant does not meet low temperature flexibility requirements.
 10. Class 12-1/2: Sealant capable of handling movement, either contraction or expansion, of 12.5 percent of the original joint width.
 11. Class 25: Sealant capable of handling movement, either contraction or expansion, of 25 percent of the original joint width.
 12. Class 35: Sealant capable of handling movement, either contraction or expansion, of 35 percent of the original joint width.
 13. Class 50: Sealant capable of handling movement, either contraction or expansion, of 50 percent of the original joint width.
 14. Class 100 / 50: Sealant capable of handling movement of 50 percent contraction and 100 percent expansion.
 15. Use Related to Exposure:
 - a. Use NT: Nontraffic.
 - b. Use T: Traffic.
 - c. Use I: Immersible.

16. Use Related to Material:
 - a. Use A: Sealant used in contact with aluminum.
 - b. Use G: Sealant used in contact with glass.
 - c. Use M: Sealant used in contact with mortar.
 - d. Use O: Sealants used in contact with all other materials other than those previously listed.

1.5 ADMINISTRATIVE REQUIREMENTS

- A. Submittal Procedures:
 1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
 2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
 3. Sustainable Design Submittals shall comply with the additional requirement of Section 01 8113, Sustainable Design Requirements.
- B. Pre-Installation Meeting: Conduct at Project site. Review joint application procedures, compatibility tests, adhesion tests, and warranty requirements in a meeting involving Architect, Project Inspector, installer, manufacturer or manufacturer's representative.
- C. Coordination:
 1. Use of different manufacturer's sealant types for application at exterior wall and glazing systems is not permitted. It is required that a single source for silicone sealants be used on this Project. The Contractor is responsible for coordinating compliance with this requirement where installation of sealants is delegated to various Subcontractors installing the exterior envelope systems for the Project.
 2. Contractor shall coordinate and be responsible for compatibility and performance between sealants and other materials, and related Sections using sealants which may be in direct contact with work of this Section or adjacent to the other. Isolate and prevent of incompatibility between sealants in accordance with manufacturer's specifications, recommendations and instructions.

1.6 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated, demonstrate compliance with specified attributes.
 1. Include color chart from manufacturers for each joint sealant product required.
 2. Provide certification by joint sealant manufacturer that materials provided for this Section are 100 percent asbestos-free.
- B. Samples for initial Selection: In form of manufacturer's standard bead samples, consisting of strips of actual products showing full range of colors available, for each product exposed to view.

JOINT SEALANTS

SECTION 07 9200

3595001

- C. Samples for Verification: For each kind and color of joint sealant required, provide Samples with joint sealants in 1/2 inch wide joints formed between two 6 inch long strips of material matching the appearance of exposed surfaces adjacent to joint sealants.
- D. Joint-Sealant Schedule: Include the following information.
 - 1. Joint-sealant application, joint location, and designation.
 - 2. Joint-sealant manufacturer and product name.
 - 3. Joint-sealant formulation.
 - 4. Joint-sealant colors (multiple colors will be required).

1.7 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.
- B. Product Certificates: For each kind of joint sealant and accessory, from manufacturer.
- C. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, indicating that sealants comply with requirements.
 - 1. Preconstruction Compatibility and Adhesion Test Reports from sealant manufacturer, indicating the following:
 - a. Materials forming joint substrates and joint-sealant backings have been tested for compatibility and adhesion with joint sealants.
 - b. Interpretation of test results and written recommendations for primers and substrate preparation needed for adhesion.
 - 2. Preconstruction Field-Adhesion Test Reports: Indicate which sealants and joint preparation methods resulted in optimum adhesion to joint substrates based on testing specified in this Section.
- D. Sustainable Design:
 - 1. General:
 - a. Submit information necessary to establish and document compliance with the California Green Building Standards Code.
 - b. Sustainable design submittals are in addition to other submittals.
 - 2. The following information shall be provided:
 - a. Adhesives and Sealants: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.
- E. Sample of manufacturer's warranty.
- F. Record of Pre-Installation Meeting.

1.8 CLOSEOUT SUBMITTALS

- A. Warranty and Guarantee: Submit executed warranty and extended Contractor guarantee.

1.9 QUALITY ASSURANCE

- A. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for installation of sealants and backing required for this Project.
- B. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.
- C. Single Source Responsibility: Obtain each kind of joint sealant from single source from single manufacturer.
- D. Materials, components, assemblies, workmanship and installation are to be observed by the Project Inspector. Work not so inspected is subject to uncovering and replacement.
- E. Mockups: Install sealant in mockups of assemblies specified in other Sections that are indicated to receive joint sealants specified in this Section. Use materials and installation methods specified in this Section.

1.10 PRECONSTRUCTION TESTING

- A. Preconstruction Testing is not required if joint-sealant manufacturers submit joint preparation data that are based on previous testing, not older than 24 months, of sealant products for adhesion to, and compatibility with, joint substrates and other materials matching those submitted.
- B. Preconstruction Compatibility and Adhesion Testing: Submit to sealant manufacturers, for testing indicated below, samples of materials that will contact or affect joint sealants.
 - 1. Use manufacturer's standard test method to determine whether priming and other specific joint preparation techniques are required to obtain rapid, optimum adhesion of joint sealants to joint substrates.
 - 2. Submit not fewer than eight pieces of each kind of material, including joint substrates, shims, joint-sealant backings, secondary seals, and miscellaneous materials.
 - 3. Schedule sufficient time for testing and analyzing results to prevent delaying the Work.
 - 4. For materials failing tests, obtain joint-sealant manufacturer's written instructions for corrective measures including use of specially formulated primers.
- C. Preconstruction Field-Adhesion Testing: Before installing sealants, field test their adhesion to Project joint substrates as follows:
 - 1. Locate test joints where indicated on Project or, if not indicated, as directed by Architect.
 - 2. Conduct field tests for each kind of sealant and joint substrate indicated.
 - 3. Notify Architect seven days in advance of dates and times when test joints will be erected.
 - 4. Arrange for tests to take place with joint-sealant manufacturer's technical representative present.

JOINT SEALANTS
SECTION 07 9200
3595001

5. Test Method: Test joint sealants according to Method A, Field-Applied Sealant Joint Hand Pull Tab, in Appendix X1 in ASTM C 1193 or Method A, Tail Procedure, in ASTM C 1521.
 - a. For joints with dissimilar substrates, verify adhesion to each substrate separately; extend cut along one side, verifying adhesion to opposite side. Repeat procedure for opposite side.
6. Report whether sealant failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each kind of product and joint substrate. For sealants that fail adhesively, retest until satisfactory adhesion is obtained.
7. Evaluation of Preconstruction Field-Adhesion-Test Results: Sealants not evidencing adhesive failure from testing, in absence of other indications of noncompliance with requirements, will be considered satisfactory. Do not use sealants that fail to adhere to joint substrates during testing.

1.11 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials to project site in original factory wrappings and containers, labeled with identification of manufacturer, product name and designation, color, expiration period for use, pot life, curing time, and mixing instructions for multicomponent materials.
- B. Store and handle materials in compliance with manufacturer's recommendations to prevent their deterioration or damage due to moisture, high or low temperatures, contaminants, or other causes.

1.12 FIELD CONDITIONS

- A. Environmental Conditions: Do not proceed with installation of joint sealants under the following conditions:
 1. When ambient and substrate temperature conditions are outside the limits permitted by joint sealant manufacturer.
 2. When joint substrates are wet.
- B. Joint Width Conditions: Do not proceed with installation of joint sealants where joint widths are less than allowed by joint sealant manufacturer for application indicated.
- C. Joint Substrate Conditions: Do not proceed with installation of joint sealants until contaminants capable of interfering with their adhesion are removed from joint substrates.

1.13 WARRANTY AND GUARANTEE

- A. Manufacturer: In addition to the Contractor's and Subcontractor's Standard Guarantee, furnish Owner with manufacturer's fully executed written warranty for sealant against defects in materials and workmanship for a period of 5 years:
- B. Contractor: in addition to its standard Guarantee under the Contract, furnish Owner a special extended written five-year guarantee, cosigned by installer, for sealant, agreeing to replace any and all joints that leaks or otherwise fails to perform as required within guarantee period as a result of failure of materials or installation workmanship at no additional cost to the Owner.

PART 2 - PRODUCTS

2.1 DESIGN AND PERFORMANCE CRITERIA

- A. Sustainable Design:
 - 1. VOC emissions for field-applied adhesives, sealants, and sealant primers must comply with limits specified in Section 01 6116.
- B. Building Envelope: Make watertight and weatherproof.
 - 1. Exterior work that does not remain watertight and all work which does not retain all properties inherent in the product as stipulated by the manufacturer will be considered faulty.
- C. Provide elastomeric joint sealants that have been produced and installed to establish and to maintain watertight and airtight continuous seals without causing staining or deterioration of joint substrates.
- D. Provide joint sealants for interior applications that have been produced and installed to establish and maintain airtight continuous seals that are water resistant and cause no staining or deterioration of joint substrates.
- E. Design Requirements:
 - 1. Seal building joints with non-sag type sealant.
 - 2. Seal floor joints with self-leveling or slope grade self-leveling type sealant.

2.2 MATERIALS, GENERAL

- A. Compatibility: Provide joint sealants, joint fillers, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by sealant manufacturer based on testing and field experience.
- B. Liquid-Applied Joint Sealants: Comply with ASTM C920 and other requirements indicated for each liquid-applied joint sealant specified, including those referencing ASTM C920 classifications for type, grade, class, and uses related to exposure and joint substrates.
 - 1. Suitability for Immersion in Liquids. Where sealants are indicated for Use I for joints that will be continuously immersed in liquids, provide products that have undergone testing according to ASTM C 1247. Liquid used for testing sealants is deionized water, unless otherwise indicated.
- C. Stain-Test-Response Characteristics: Where sealants are specified to be non-staining to porous substrates, provide products that have undergone testing according to ASTM C 1248 and have not stained porous joint substrates indicated for Project.
- D. Suitability for Contact with Food: Where sealants are indicated for joints that will come in repeated contact with food, provide products that comply with 21 CFR 177.2600.

JOINT SEALANTS
SECTION 07 9200
3595001

E. Colors:

1. General:
 - a. Architect will provide color selections and locations for each sealant type and for Contractor's use.
 - b. Not all locations will have the same color.
 - c. Custom colors **[will] [may]** be required.
2. Provide color of exposed joint sealants to comply with the following:
 - a. Provide colors matching selections made by Architect from manufacturer's full range of colors for products of type indicated.
 - b. Request color selection for exposed products listed without a preselected color.

2.3 SILICONE JOINT SEALANTS

- A. Single-Component, Nonsag, Neutral-Curing Silicone Joint Sealant: ASTM C920, Type S, Grade NS, Class 100 / 50, for Use NT.
 1. Products: The following, or equal:
 - a. The Dow Chemical Company; "DOWSIL" 790.
 - b. Sika Corporation, Construction Products Division; "Sikasil" WS-290.
- B. Single-Component, Nonsag, Neutral-Curing Silicone Joint Sealant: ASTM C920, Type S, Grade NS, Class 50, for Use NT.
 1. Products: The following, or equal:
 - a. Dow Corning Corporation; "DOWSIL 795 Building Sealant".
 - b. Sika Corporation, Construction Products Division; "Sikasil WS-295."
- C. Single-Component, Nonsag, Non-Bleed, Neutral-Curing Silicone Joint Sealant: ASTM C920, Type S, Grade NS, Class 50, for Use G, M, A and O.
 1. Products: The following, or equal:
 - a. The Dow Chemical Company; "DOWSIL 756 SMS."
 - b. Momentive Performance Materials; "SCS9000 SilPruf NB."
- D. Single-Component, Nonsag, One Part RTV Neutral-Curing Silicone Joint Sealant: ASTM C920, Type S, Grade NS, Class 25, designed for adhering to low energy surfaces common in sheet or peel and stick weather resistant barriers.
 1. Products: The following, or equal:
 - a. The Dow Chemical Company; "DOWSIL" 758.
 - b. Sika Corporation, Construction Products Division; "Sikasil-N Plus."
- E. Mildew-Resistant, Single-Component, Acid-Curing Silicone Joint Sealant: ASTM C920, Type S, Grade NS, Class 25, for Use NT, A and O.
 1. Products: The following, or equal:
 - a. The Dow Chemical Company; "DOWSIL 786 Mildew Resistant."

- b. Momentive Performance Materials; GE Silicones “Sanitary SCS1700.”

2.4 URETHANE JOINT SEALANTS

- A. Single-Component, Nonsag, Urethane Joint Sealant: ASTM C920, Type S, Grade NS, Class 35, for Use NT.
 - 1. Products: The following, or equal:
 - a. BASF Master Builders Solutions; “MasterSeal NP 1.”
 - b. Sika Corporation, Construction Products Division; “Sikaflex-1a.”
- B. Multicomponent, Nonsag, Urethane Joint Sealant: ASTM C920, Type M, Grade NS, Class 25, for Use NT, M, A and O.
 - 1. Products: The following, or equal:
 - a. BASF Master Builders Solutions; “MasterSeal NP 2.”
 - b. Sika Corporation, Construction Products Division; “Sikaflex-2c NS.”
- C. Multicomponent Urethane Joint Sealant: ASTM C920; self-leveling, Type M, Grade P, Class 25, Uses T, M, A, O, and approved by manufacturer for wide joints up to 1-1/2 inches.
 - 1. Products: The following or equal:
 - a. BASF Master Builders Solutions; “MasterSeal SL 2.”
 - b. Sika Corporation, Construction Products Division; “Sikaflex 2c SL.”

2.5 BUTYL JOINT SEALANTS

- A. Butyl-Rubber-Based Joint Sealants: ASTM C1311 and FS TT-S-001657, Type I.
 - 1. Products: The following, or equal:
 - a. Bostik, Inc.; “Chem-Calk 300.”
 - b. Pecora Corporation; “BC-158.”

2.6 ACRYLIC LATEX JOINT SEALANTS

- A. Latex Joint Sealant: Acrylic latex or siliconized acrylic latex, nonsag, paintable, nonstaining. ASTM C 834, Type OP, Grade NF.
 - 1. Products: The following, or equal:
 - a. Pecora Corporation; “AC-20.”
 - b. Sherwin Williams; 950A.

2.7 ACOUSTICAL JOINT SEALANTS

- A. Acoustical Sealant; ASTM C834, nonsag, paintable, nonstaining latex sealant. Effectively reduce airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E90.

JOINT SEALANTS
SECTION 07 9200
3595001

1. Products: The following, or equal:
 - a. Pecora Corporation; "AC-20" or "AC-20 FTR" (Fire and Temperature Rated).
 - b. United States Gypsum Company: USG "Sheetrock Acoustical Sealant,"

2.8 JOINT SEALANT BACKING

- A. General: Provide sealant backings of material and type that are nonstaining; are compatible with joint substrates, sealants, primers and other joint fillers; and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.
- B. Cylindrical Sealant Backer Rods: Compressible, non-gassing rod-stock complying with ASTM C1330; polyethylene-jacketed polyurethane foam; butyl-rubber foam; neoprene foam; or other flexible, permanent, durable, non-absorptive closed-cell (Type C), open cell (Type O), or bi-cellular material (Type B) and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.
 1. Open cell rods shall not be used at sealant joints for horizontal surfaces.
 2. Closed cell rods shall not be used at double sealant joints.
- C. Bond-Breaker Tape: Polyethylene tape or other plastic tape as recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint filler materials or joint surfaces at back of joint where such adhesion would result in sealant failure. Provide self-adhesive tape where applicable.

2.9 SEALANT ACCESSORIES AND ADDITIONAL MATERIALS

- A. Primer: Material recommended by joint sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint sealant-substrate tests **[and field tests]**.
- B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming in any way joint substrates and adjacent nonporous surfaces, and formulated to promote optimum adhesion of sealants with joint substrates.
- C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.
- D. Spall Repair Mortar: Two-component structural epoxy binder and sand aggregate, producing a mortar that is easily worked and troweled. Early-set system designed specifically for the repair of industrial concrete floors subject to hard wheeled traffic. Compatible with joint filler and recommended by the joint filler manufacturer in writing.
 1. Products: The following, or equal:
 - a. Metzger/McGuire: "Armor-Hard."

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting joint sealant performance. Do not proceed with installation of joint sealants until unsatisfactory conditions have been corrected.
- B. Commencement of work indicates acceptance of substrates.

3.2 PREPARATION

- A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with recommendations of joint sealant manufacturer and the following requirements:
 - 1. Remove foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.
 - 2. Clean concrete, masonry, unglazed surfaces of ceramic tile, and similar porous joint substrate surfaces by brushing, grinding, blast cleaning, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining from above cleaning operations by vacuuming or blowing out joints with oil-free compressed air.
 - 3. Remove laitance and form release agents from concrete.
 - 4. Clean metal, glass, porcelain enamel, glazed surfaces of ceramic tile, and other nonporous surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants.
- B. Spall Repair: Repair spalled joints in concrete slabs to produce joints of profiles recommended by joint sealer manufacturers.
- C. Joint Priming:
 - 1. Prime joint substrates where indicated or where recommended by joint sealant manufacturer based on preconstruction joint sealant-substrate tests or prior experience.
 - 2. Apply primer to comply with joint sealant manufacturer's recommendations. Confine primers to areas of joint sealant bond; do not allow spillage or migration onto adjoining surfaces.
- D. Masking Tape:
 - 1. Use masking tape where required to prevent contact of sealant with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears.

JOINT SEALANTS
SECTION 07 9200
3595001

2. Remove tape immediately after tooling without disturbing joint seal.
- E. Remove sealant and prepare joints in existing exterior locations as directed by representative of sealant manufacturer specified in this work.

3.3 INSTALLATION OF JOINT SEALANTS

- A. General:
 1. Comply with joint sealant manufacturer's printed installation instructions applicable to products and applications indicated, except where more stringent requirements apply.
 2. Seal around penetrations, holes, gaps, surface mounted fixtures and pipes entering building including light fixtures, mounting brackets and other similar items.
- B. Sealant Installation Standard: Comply with recommendations of ASTM C1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.
- C. Joint Sealants at Building Exterior and Interior:
 1. Seal the following joints with joint sealant:
 - a. Expansion and control joints in exterior walls, copings, parapets.
 - b. Joints between metal panels.
 - c. Joints between door and window frames and adjacent materials.
 - d. Joints between cabinets and countertops and walls.
 - e. Control joints in interior partitions, including portion above ceilings.
 - f. Expansion and control joints in solid exterior soffits.
 - g. Control joints in interior ceilings and soffits.
 2. Apply continuous bead of joint sealant in the following locations during installation of materials specified elsewhere:
 - a. In lap joints of sheet metal construction.
 - b. Roofing panels and roof-related sheet metal and flashing.
 - c. Between partition floor and ceiling tracks and adjacent construction.
 - d. Between end stud of partition and adjacent construction.
 - e. Under door sills and thresholds.
 - 1) Set sills and thresholds in continuous double bead of sealant.
 - 2) Provide sealant at butt ends of thresholds against door frame, around door frame and between threshold and resilient floor covering.
 3. Apply acoustic sealant at acoustic separations to make assembly airtight.
 - a. Seal perimeter and intersections of finish.
 - b. Seal around electrical boxes and other penetrations of finish; seal holes within electrical boxes; seal conduit ends.
 - c. Seal pipes which penetrate acoustic separations.
 4. Apply joint sealant at joints not specifically mentioned above which require sealant to meet the performance criteria cited in this Section.

- D. Installation of Sealant Backer Rods: Install sealant backer rods to comply with the following requirements:
1. Install joint fillers of type indicated to provide support of sealants during application and at position required to produce the cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
 - a. Do not leave gaps between ends of joint fillers.
 - b. Do not stretch, twist, puncture, or tear joint fillers.
 - c. Remove absorbent joint fillers that have become wet prior to sealant application and replace with dry material.
 2. Install bond breaker tape between sealants where backer rods are not used between sealants and joint fillers or back of joints.
- E. Sealant Installation:
1. Install sealants by proven techniques that result in sealants directly contacting and fully wetting joint substrates, completely filling recesses provided for each joint configuration, and providing uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.
 2. Install sealants at the same time sealant backings are installed.
- F. Tooling of Nonsag Sealants:
1. Immediately after sealant application and prior to time skinning or curing begins, tool sealants to form smooth, uniform beads of configuration indicated, to eliminate air pockets, and to ensure contact and adhesion of sealant with sides of joint. Remove excess sealants from surfaces adjacent to joint.
 2. Do not use tooling agents that discolor sealants or adjacent surfaces or are not approved by sealant manufacturer.
 3. Profiles:
 - a. Provide concave joint configuration in accordance with Figure 8A in ASTM C1193, unless otherwise indicated.
 - b. Provide flush joint configuration in accordance with Figure 8B in ASTM C1193, where indicated.
 - c. Provide recessed joint configuration in accordance with Figure 8C in ASTM C1193, of recess depth and at locations indicated.
 - 1) Use masking tape to protect adjacent surfaces of recessed tooled joints.
- G. Joint Fillers in Refrigerated Rooms:
1. Apply joint filler only after rooms have been brought down to the final temperature for five calendar days.
 2. Provide supplemental heat and dual dispensing system as required to apply in strict accordance with the manufacturer's directions.

JOINT SEALANTS

SECTION 07 9200

3595001

3.4 DEFECTIVE WORK

- A. Repair damaged and defective work and eliminate functional and visual defects. Where repair is not possible replace work. Adjust joints for uniform appearance.
- B. Cut out and remove damaged or deteriorated joint sealants immediately so that and installations with repaired areas are indistinguishable from original work.

3.5 CLEANING AND PROTECTION

- A. Clean off excess sealants or sealant smears adjacent to joints as work progresses by methods and with cleaning materials approved by manufacturers of joint sealants and of products in which joints occur.
- B. Clean excess adhesive from exposed surfaces of neoprene compression seal with solvent cleaner as recommended by manufacturer.
- C. Protect joint sealants during and after curing period from contact with contaminating substances or from damage resulting from construction operations or other causes so that they are without deterioration or damage at time of Substantial Completion.

3.6 SEALANT SCHEDULE

- A. General:
 - 1. Joints in construction between interior and exterior spaces and other designated or required locations to provide effective barrier against passage of elements:
 - a. Multicomponent, Nonsag, Urethane Joint Sealant: ASTM C920, Type M, Grade NS, Class 25, for Use NT, M, A and O.
 - b. Single-Component, Nonsag, Urethane Joint Sealant: ASTM C920, Type S, Grade NS, Class 25, for Use NT.
 - 2. Specialty perimeters where required for appearance or weather tightness:
 - a. Multicomponent, Nonsag, Urethane Joint Sealant: ASTM C920, Type M, Grade NS, Class 25, for Use NT, M, A and O; capable of 50 percent extension and compression movement.
 - b. Single-Component, Nonsag, Urethane Joint Sealant: ASTM C920, Type S, Grade NS, Class 35, for Use NT.
 - c. Single-Component, Nonsag, Neutral-Curing Silicone Joint Sealant: ASTM C920, Type S, Grade NS, Class 50, for Use NT.
 - d. Single-Component, Nonsag, Neutral-Curing Silicone Joint Sealant: ASTM C920, Type S, Grade NS, Class 100 / 50, for Use NT.
- B. Exterior Locations:
 - 1. Joints Bordered by Glass: Single-component, nonsag, neutral-curing silicone joint sealant, ASTM C920, Type S, Grade NS, Class 50, for Use NT.
 - 2. Joints Bordered by Plastic: Single-component, nonsag, neutral-curing silicone joint sealant, ASTM C920, Type S, Grade NS, Class 100 / 50, for Use NT.

3. Horizontal Joints in Exterior Walks Abutting Building Walls, Interior Concrete Floors: Multicomponent urethane sealant, self-leveling; ASTM C920, Grade P, Class 25, Uses T, M and A.
 - a. Where walks abut structural slabs or stoops.
 - b. Where walks abut exterior wall of buildings.
 - c. Where exposed interior concrete slabs abut vertical surfaces.
 - d. Where sealant is shown on the Drawings for concrete slabs.
4. Sheet Metal and Roof Accessory Sealants: Types recommended by roofing manufacturer and complying with requirements of this Section.
5. Exterior Sheet Metal Lap Joints: Types recommended by manufacturer and complying with requirements of this Section.
6. Joints Between Concrete Panels, and Between Concrete Panels and Other Work: Single-component, nonsag, neutral-curing silicone joint sealant, ASTM C920, Type S, Grade NS, Class 100 / 50, for Use NT and formulated to reduce or eliminate dirt pickup, surface streaking, and substrate staining.
7. Exterior Metal Panel Butt Joints and Trim: Types recommended by manufacturer and complying with requirements of this Section.
8. Sills and Thresholds: Butyl-rubber-based joint sealants, ASTM C1311.
9. All Other Exterior Joints:
 - a. Single-component, nonsag, neutral-curing silicone joint sealant, ASTM C920, Type S, Grade NS, Class 100 / 50, for Use NT.
 - b. Single-component, nonsag, neutral-curing silicone joint sealant, ASTM C920, Type S, Grade NS, Class 50, for Use NT.
 - c. Around perimeters of frames where door, window and louver frames abut concrete, masonry or other building materials.
 - d. Expansion and control joints in masonry.
 - e. Masonry at dissimilar material or at dissimilar masonry.
 - f. Miscellaneous locations where sealant is shown on Drawings.

C. Interior Locations:

1. Expansion and Control Joints:
 - a. Multicomponent, Nonsag, Urethane Joint Sealant: ASTM C920, Type M, Grade NS, Class 25, for Use NT, M, A and O.
 - b. Single-Component, Nonsag, Urethane Joint Sealant: ASTM C920, Type S, Grade NS, Class 35, for Use NT.
 - c. Around perimeters of frames where door, window and louver frames abut concrete, masonry or other building materials.
 - d. Expansion and control joints in masonry walls.
 - e. Masonry at dissimilar material or at dissimilar masonry.
 - f. At miscellaneous locations where sealant is shown on Drawings.
2. Sills and Thresholds: Butyl-Rubber-based joint sealants, ASTM C1311.

JOINT SEALANTS

SECTION 07 9200

3595001

3. Interior Wet Areas, Around Plumbing Fixtures, Countertops Abutting Walls, Food Service Applications: Mildew-resistant, single-component, acid-curing silicone joint sealant, ASTM C920, Type S, Grade NS, Class 25, for Use NT, A and O.
4. Interior Static Dry Joints as Required to Dress Appearance: Acrylic latex or siliconized acrylic latex joint sealant, ASTM C 834, Type OP, Grade NF
5. Sound Control Applications: Acoustical Sealant, ASTM C 834
 - a. Where Required for Sound Control with Limited Flame Spread: Acoustical sealant, ASTM C 834, fire-rated type.

END OF SECTION

*P:\Sacramento\3595 Tracy Unified School District\001-000_Villalovoz ES New Shade Structures\08 Specifications\06 SPEC\04
FINAL\Bohn\07 9200_Joint Sealants.docx
Last Updated: March 24, 2021*

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Painting and painter's finish on all exposed exterior and interior surfaces, except prefinished items and unless otherwise noted, as required to complete finishing of the Work. The Work includes, but is not necessarily limited to, the following specific items:
1. Paint, stain or otherwise finish all new surfaces.
 2. Back priming of concealed surfaces, except as otherwise specified.
 3. Paint, repaint or finish of existing painted surfaces altered, defaced or damaged as a result of work of this Contract.
 4. Paint site items which are not prefinished, including posts, screens, panels, bollards, supports, rails and other similar improvements.
 5. Mechanical and plumbing vents on roof.
 6. Unpainted or unfinished exposed building components, pipes and conduit, including sprinkler piping, and metal ductwork, which run exposed across finished or painted surfaces.
 7. Painting work in rooms where finishing work is performed, including painting new surfaces as specified and re-painting existing surfaces within the room, unless otherwise indicated. Re-painting existing surfaces shall be with minimum of one coat using specified coatings compatible with existing.
- B. Surface treatment, priming and coats of paint specified in this Section are in addition to shop priming and surface treatment specified under other Sections unless otherwise noted.
- C. Items Not Included in This Section:
1. Factory and shop-prefinished items as specified in various Sections.
 2. Painting specified elsewhere and included in respective Sections, including but not necessarily limited to shop priming.

1.2 WORK NOT TO BE PAINTED UNLESS OTHERWISE INDICATED

- A. Exposed exterior concrete and concrete slab surfaces, except as noted.
- B. Suspended acoustical ceilings and acoustical tile, except as noted.
- C. Pre-finished casework and other factory and shop-prefinished items as specified in various Sections.
- D. Finish hardware except prime coated items.
- E. Items typically not to be painted including, but not limited to, the following:
1. Glass.

PAINTING
SECTION 09 9100
3595001

2. Ceramic tile.
 3. Membrane roofing.
 4. Safety nosings.
 5. Resilient floor covering and base.
 6. Carpet.
 7. Pre-finished paneling.
 8. Plastic laminate.
 9. Porcelain enamel.
 10. Vinyl wallcovering, except where noted.
- F. Aluminum doors, windows, frames and railings.
- G. Metal or plastic toilet partitions.
- H. Items of chromium, copper, nickel, brass, bronze or stainless steel.
- I. Surfaces in concealed areas such as furred spaces.
- J. Tops of gravel stop flanges (including priming) where roofing material will be adhered to.
- K. Wall areas concealed by cases, counters, cabinets, chalkboards, tackboards (prime coat only required).
- L. Piping or conduit including brackets and similar items therewith running on or across unpainted or otherwise unfinished walls or ceilings.
- M. Galvanized gratings, recessed foot grilles, and thresholds.
- N. Structural steel scheduled to receive fireproofing.

1.3 RELATED REQUIREMENTS

- A. Section 01 6116, Volatile Organic Compound (VOC) Restrictions; for VOC limits pertaining to adhesives, sealants, fillers, primers, and coatings.
- B. Section 01 8113, Sustainable Design Requirements, for CAL-Green general requirements and procedures.
- C. Section 07 6200, Sheet Metal Flashing and Trim.
- D. Section 07 9200, Joint Sealants.
- E. Section 09 2900, Gypsum Board.
- F. Divisions 22, 23 and 26, Exposed piping, ductwork and conduit.

1.4 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).

- B. California Green Building Standards Code (CAL Green), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- C. ASTM International (ASTM):
 - 1. D523: Standard Test Method for Specular Gloss.
 - 2. D4263: Standard Test Method for Indicating Moisture in Concrete by the Plastic Sheet Method.
 - 3. D6386: Standard Practice for Preparation of Zinc (Hot-Dip Galvanized) Coated Iron and Steel Product and Hardware Surfaces for Painting.
 - 4. D7396: Standard Guide for Preparation of New, Continuous Zinc-Coated (Galvanized) Steel Surfaces for Painting.
- D. Master Painters Institute (MPI):
 - 1. Architectural Painting Manual Guide Specification.
- E. The Association for Materials Protection and Performance (AMPP):
 - 1. SSPC-Society for Protective Coatings/ National Association of Corrosion Engineers International (NACE):
 - a. SSPC-SP 1: Solvent Cleaning.
 - b. SSPC SP-10/NACE No. 2: Near-White Metal Blast Cleaning.
 - c. SSPC-SP 16: Brush-Off Blast Cleaning of Coated and Uncoated Galvanized Steel, Stainless Steels, and Non-Ferrous Metals.

1.5 ADMINISTRATIVE REQUIREMENTS

- A. Submittal Procedures:
 - 1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
 - 2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
 - 3. Sustainable Design Submittals shall comply with the additional requirement of Section 01 8113, Sustainable Design Requirements.

1.6 ACTION SUBMITTALS

- A. Product Data: Submit list and complete descriptive data of products proposed for use. Include manufacturer's specifications, published warranty or guarantee, and application instructions. Cross-reference to paint system and locations of application areas.
- B. Samples:
 - 1. Appropriately label and identify each sample, including location and application. Include **[Architect's number as scheduled on the Drawings,]** manufacturer's name, color number, and gloss units.
 - 2. Prepare on 8 inch x 10 inch card stock for selected colors and finishes.

PAINTING
SECTION 09 9100
3595001

3. Submit sufficiently ahead of work progress to allow for color board assembly and distribution.
4. Resubmit as requested until required sheen, color, and texture are approved.

1.7 INFORMATIONAL SUBMITTALS

- A. Statement of applicator qualifications.
- B. Sustainable Design:
 1. General:
 - a. Submit information necessary to establish and document compliance with the California Green Building Standards Code.
 - b. Sustainable design submittals are in addition to other submittals.
 2. The following information shall be provided:
 - a. Paints and Coatings: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.

1.8 CLOSEOUT SUBMITTALS

- A. Guarantee: Submit Subcontractor's guarantee.

1.9 MAINTENANCE MATERIAL SUBMITTALS

- A. At completion of the Work, deliver to Owner extra stock of paint of each color used in each coating material used.
- B. Containers shall be full, tightly sealed, and clearly marked.
- C. Provide the following quantities:
 1. Field Colors: 1 five-gallon container.
 2. Accent Colors: 1 one-gallon container.

1.10 QUALITY ASSURANCE

- A. Use only new materials and products.
- B. Single-Source Responsibility:
 1. To the maximum extent practicable, select a single manufacturer to provide all materials required by this Section, using additional manufacturers to provide systems not offered by the selected principal manufacturer.
 2. For each individual system:
 - a. Provide primer and other undercoat paint produced by same manufacturer as finish coat.
 - b. Use thinner within manufacturer's recommended limits.
- C. Source Quality Control: Material shall be best grade products of type specified and listed below as regularly manufactured by these manufacturers. Materials not bearing

manufacturer's identification as standard "best grade product" of their regular line will not be considered for use.

- D. Materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.
- E. Materials and application procedures shall comply with local, state and federal air pollution control regulations.
- F. Manufacturer's representative from coating supplier shall visit the site prior to application to review and approve the specified systems. Discrepancies or recommended changes shall be submitted to the Architect for consideration prior to finalization of submittal.
- G. Site Application Mockup:
 - 1. Prior to ordering materials and unless waived by the Architect in writing, the Contractor shall provide large scale mockup areas for all colors, both interior and exterior, directly applied to the building for final color approval by the Architect.
 - 2. Minimum Size:
 - a. Ceiling Areas: Finish a panel 10 feet square.
 - b. Wall Areas: Finish a panel 8 feet long by full height of wall.
 - c. Finish a portion of other items as directed by Architect.
 - 3. Provide up to 2 adjustments at no extra cost to the Owner.
 - 4. Paint shall not be ordered or applied until such large scale sample(s) have been reviewed and approved by the Architect in writing. These requirements as described herein may be waived by the Architect in writing only.

1.11 DELIVERY, STORAGE AND HANDLING

- A. Deliver undamaged products to job in manufacturer's sealed containers and/or original bundles with tags and labels intact.
- B. Store materials in protected, clean, dry conditions off of ground and in areas which will not interfere with the progress of the Work.
- C. Transport, store and handle in strict accordance with the manufacturer's written recommendations and as specified below.
- D. Remove paint-soiled rags and waste from premises at end of each day's work or store in metal containers with metal covers.
- E. Paint stored at site, shall be in separate structure not less than 60 feet from any other building or structure. Remove empty containers and soiled rags as they accumulate. At completion, remove structure, cleanup area, and leave in original condition.

PAINTING
SECTION 09 9100
3595001

1.12 FIELD CONDITIONS

- A. Do not apply paints and coatings under conditions which jeopardize quality or appearance of painting or finishing.
- B. Cover or otherwise protect finished work of other trades and surfaces not being painted concurrently or not to be painted.
- C. Exterior:
 - 1. Comply with manufacturer's recommendations as to environmental conditions under which coatings and coating systems can be stored and applied.
 - 2. Do not apply exterior paint when air or surface temperature is under 50 degrees F or when air or surface temperature will be below 50 degrees F for 48 hours after painting.
 - 3. Do not apply immediately following snow, rain, dew or during foggy weather.
 - 4. Do not apply when temperature is over 85 degrees F except in protected or shaded areas.
- D. Interior:
 - 1. Do not apply interior paint when air or surface temperature is below 50 degrees F unless temperature is maintained constantly.
 - 2. Do not apply when ventilation is inadequate to maintain humidity lower than dew point of coldest wall.
- E. Use moisture meter for determining proper moisture levels of surfaces for painting.
- F. Report to Architect in writing upon discovery of any prime coat painting specified in other Sections of Specifications that would prevent proper application of specified finish.
- G. Furnish, erect and remove scaffolding and planks required for work under this Section. Conform to state and local codes, rules and regulations.

1.13 EXISTING CONDITIONS

- A. Existing Surfaces:
 - 1. Paint or otherwise finish all existing surfaces as indicated or scheduled on the Drawings.
 - 2. Work includes primer, paint, repaint or finish of existing painted surfaces altered, defaced or damaged as a result of work under this Contract.
- B. Existing surfaces to be painted include:
 - 1. Exterior wall surfaces, including fascia, trim.
 - 2. Soffits and exterior ceilings including exposed roof framing.
 - 3. Doors and frames, both wood and metal.
 - 4. Window frames, trim and solid infill panels except unpainted or prefinished aluminum.

5. Exposed conduit, piping, brackets, supports, and similar metal fabrications.
6. Downspouts and gutters.
7. Parapet caps and exposed flashings.
8. Mechanical well walls, all surfaces.
9. Concrete foundation where exposed below painted wall surfaces.
10. Roll-up doors and frames.
11. Closure panels between relocatable buildings.
12. Enclosure walls, screen walls, equipment yards.
13. Other work as shown on the Drawings, specified, or as required for a complete Project.

1.14 GUARANTEE

- A. Contractor: Under conditions of its Guarantee under the Contract, paint colors shall be substantially unchanged and finishes shall maintain their original adherence without showing blisters, flaking, peeling, scaling, staining or unusual deterioration or other defects.

PART 2 - PRODUCTS

2.1 DESIGN AND PERFORMANCE CRITERIA

- A. Sustainable Design:
 1. VOC emissions for field-applied paints and coatings must comply with limits specified in Section 01 6116.

2.2 MANUFACTURERS AND COATING PRODUCTS

- A. Products are specified under "Paint Systems" in Part 3 below and are manufactured by Kelly-Moore, except as otherwise indicated. Equivalent products to those scheduled manufactured by Sherwin-Williams, PPG Architectural Finishes, Glidden Professional, Benjamin Moore & Co., Dunn-Edwards, Vista, or equal, are acceptable.
- B. Materials selected for coating systems for each type surface shall be the product of a single manufacturer or shall be acceptable to manufacturer of finish coating for system.
- C. If more than one quality level of product type is marketed, use material of highest quality.

2.3 MIXING AND TINTING

- A. Deliver paints and stains ready mixed to jobsite. On-site color mixing or tinting will not be allowed.
- B. Each kind of coating for paint finishes shall be factory-mixed to match approved samples, colors, and ready for immediate application.
- C. Mix proprietary products in strict accordance with manufacturer's printed directions.

PAINTING
SECTION 09 9100
3595001

- D. Thinning, if permitted by manufacturer for a specific coating, shall be in accordance with manufacturer's instructions. Thinning of other products shall be in accordance with standard practice.

2.4 COLORS

- A. Colors shall be as scheduled on the Drawings.
- B. Architect will prepare a color schedule with samples for guidance of painter and reserves right to select, allocate, and vary colors on different surfaces throughout building.
 - 1. Colors selected by Architect may be from manufacturer's full range standard palette or be custom mixed.
 - 2. Unless otherwise indicated on the Drawings, different colors will be selected for different materials such as walls, trim, and doors.
- C. Colors to be selected by the Architect, or where scheduled on the Drawings, are solely for the purpose of conveying color information and do not imply manufacturer's approval or waiver of the requirement that all coatings be from the same manufacturer, unless a specific system is not available from the primary manufacturer.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Prior to the work of this Section, carefully inspect and verify that the installed work of all other trades is complete to the point where this work may properly commence.
- B. Verify that painting may be performed in accordance with the approved design.
- C. In the event of discrepancy, immediately notify Architect. Do not proceed in discrepant areas until discrepancies have been fully resolved.

3.2 PREPARATION

- A. General:
 - 1. Surface preparation and product application shall be in accordance with manufacturer's printed instructions.
 - 2. In addition to prime coats indicated (primer, sealer, filler, undercoat), use two finish coats minimum, and additional coats as required for complete coverage and good appearance of scheduled finish coat.
 - 3. Surfaces to receive new finish shall be properly prepared prior to application of finish coatings.
 - 4. Do not apply paint, enamel, stains or varnishes to wet, damp, dusty, finger-marked, rough, unfinished, or defective surfaces until such defects have been corrected.
- B. Wood - Interior:

1. Thoroughly sandpaper and dust off woodwork; putty nail holes, cracks, and other defects after first coat to match color of paint. Putty where finish will be clear.
2. First coat on wood surfaces shall be sanded smooth. Other coats, except finish coat, shall be lightly sanded and dusted before and between each coat.
3. Smoothing, rubbing and sand-papering shall be sufficient to insure good results. Sand down all raised grain or rough surfaces and re-coat. Knots, pitch pockets and sappy portion of wood, all nail holes, cuts, cracks and other defects in wood shall have any necessary extra treatment to provide proper paint base.

C. Wood – Exterior:

1. Surfaces shall be dry and free of grease and splatters.
2. Rough surfaces shall be sanded smooth. **[Do not sandpaper resawn surfaces.]**
3. At opaque finish, fill nail holes, cracks, open joints, and other defects with filler after priming coat has dried. Exposed nail heads shall be spot primed.
4. Avoid painting surfaces while exposed directly to hot sun.
5. Smooth surfaces shall be sanded thoroughly to allow proper penetration and adhesion. Areas exhibiting tannic acid staining shall receive two coats of primer waiting 24 hours between coats. Sand and prime as soon as possible after installation to avoid UV degradation of unpainted wood surface.
6. Mildew, if present, shall be removed by scrubbing with a commercial mildew wash in accordance with manufacturer's directions.

D. Metals-General:

1. On metal work, only such sanding will be required as is necessary to provide for complete bonding of coats.
2. Steel and ironwork shall be scraped clean of scale, and rust and any grease shall be entirely removed.
3. Touch-up scratched and damaged places on metal priming coats.
4. Galvanized or zinc-coated metal shall be given an approved acid treatment 48 hours before paint is applied.
5. Prep and prime coat factory or shop primed metal products, including metal doors and frames, exposed framing, and other exposed metal if material was not shop primed.
6. Metal surfaces receiving epoxy coatings shall have stripe coat applied at all welds, edges, joints, etc., with epoxy primer prior to application of primer.

E. Metals–Galvanized Surfaces:

1. Surfaces shall be cleaned, and profiled where specified, prior to receiving applied coatings in accordance with ASTM D6386 or ASTM D7396 for sheet products.
 - a. Methods shall be selected based on age of galvanized coating, condition of surface and intended paint coating.
 - b. Care shall be taken not to damage the zinc coating.
 - c. Do not use phosphate treatment on galvanized surfaces scheduled to receive zinc-rich primers.

PAINTING
SECTION 09 9100
3595001

2. Comply with additional recommendations included in the AGA document "Duplex Systems: Painting Over Hot Dip Galvanized Steel."
3. Comply with any additional procedures required by the coating manufacturer.

3.3 REPAINTING EXISTING EXTERIOR SURFACES

A. General:

1. Exterior surfaces required to be re-painted, shall be power washed with surfactant, followed by rinsing to remove all loose coatings, chalk, dirt, efflorescence, oils, and other contaminants that would inhibit bond of new coating.
2. Mold or mildew shall be treated with bleach solution followed by thorough rinsing.
3. Protect openings into interior spaces during power washing including louvers, vents, vent screeds, grilles, to prevent water from entering interior areas including, attics and soffits.

B. Ferrous Metal: Steel framing, metal doors and frames, louvers, metal ductwork, and similar Items:

1. Remove all flaking, peeling and poorly bonded coatings, including rust from metal surfaces using power tool sanders or equivalent equipment. Feather edge remaining coatings.
2. Solvent scrub with MEK, all exposed bare metal, shop applied pretreatment and chalked coatings.
3. Spot prime exposed bare metal and metal pre-treatment prior to application of specified prime coat.

C. Galvanized Metal: Down spouts, wall caps, and Other Exposed Galvanized Metal.

1. Remove all loose, flaking or peeling coatings by scraping, chipping or sanding. Feather all rough edges by sanding.
2. Apply phosphoric acid etch pre-treatment to exposed galvanized metal.

D. Plaster:

1. Remove loose coatings using hand or power tools.
2. Patch plaster areas where original material has cracked, spalled or otherwise been removed with compatible material. Fill areas completely to provide smooth, even surface for refinishing. Spot prime patches prior to proceeding.
3. Patch masonry joints with cracks or missing material with compatible materials.

E. Wood Siding and Trim:

1. Remove loose, flaking or peeling coatings by scraping, chipping or sanding. Feather rough edges by sanding.
2. Surfaces that exhibit moderate to heavy chalk deposits shall be thoroughly cleaned to sound substrate by wire brushing, sanding, or power washing.
3. Spot prime bare wood, exposed nail and fastener heads prior to application of specified prime coat.

4. Glossy surfaces shall be dulled by sanding. Crystalline deposits shall be removed by flushing with water from a hose.
5. Mildew, if present, shall be removed by scrubbing with a commercial mildew wash in accordance with manufacturer's directions.

3.4 CAULKING

- A. Caulk all cracks in finished surfaces.
- B. Seal around any wall openings where original sealant is not fully sealing.
- C. Provide sealant at material transitions and intersections as required.

3.5 PROTECTION

- A. Hardware, fixture canopies, outlet covers, switch plates and other such items shall be removed or loosened and replaced after completing work as required for painting and finishing. Protect items until reinstalled.
- B. Protect work and work of others during progress against damage. Leave such work clean and whole. Correct damage by cleaning, repairing, replacing or repainting as directed.
- C. Provide necessary drop cloths for protection of work. Cover finished surfaces adjacent to work.

3.6 APPLICATION

- A. General:
 1. Do not apply initial coating until moisture content of surface is within limitations recommended by paint manufacturer.
 2. Apply coatings in accordance with manufacturer's recommendations and the additional requirements, as applicable, of the Architectural Painting Manual Guide Specifications for application methods and paint systems.
 3. Flow coat on evenly and well brushed in. Should dead spots occur, touch-up before next coat is applied. Should spots or cracks burn through after final coat is applied, apply additional coats to entire surface as necessary to remedy defects.
 4. Rate of application shall be within limits recommended by paint manufacturer for surface involved.
- B. Thicknesses: Rate of application shall be within limits recommended by paint manufacturer for surface involved and comply with the following.
 1. Paint materials shall be applied in manner to average 1.5 to 3 Dry Mills in thickness for the total number of coats scheduled.
 2. Provide Tooke Dry Mill Coating Inspection Gauge manufactured by Micro Metrics Company to the Project Inspector for inspection of finished coating systems, if requested.

PAINTING
SECTION 09 9100
3595001

- C. Refinish whole area where portion of finish is not acceptable.
- D. Adjust natural finishes as necessary to obtain identical appearance on veneers and solid stock.
- E. Equipment adjacent to walls shall be disconnected, using workers skilled in appropriate trades, and moved to permit wall surfaces to be painted. Following completion of painting, they shall be expertly replaced and reconnected.
- F. Top and bottom edges of all doors shall receive same paint system finish required for door faces.
- G. Do not paint over fire-rating labels, fusible links, or sprinkler heads.

3.7 DEFECTIVE WORK

- A. Painter shall be responsible for damage or unsuitable work, including that caused by improperly prepared surfaces. Refinishing shall be at no cost to the Owner. Repair work damaged during construction; touch-up or refinish as necessary any abraded, stained or otherwise damaged surfaces.

3.8 CLEANING AND PROTECTION

- A. Thoroughly clean any drips, splatters, spills, splashes, etc., from walls, floor or other surfaces, with no damage to those surfaces.
- B. Protect work and materials of this Section prior to and during installation, and protect the installed work and materials of other trades.
- C. In the event of damage, make all repairs and replacements necessary to the approval of the Architect at no additional cost to the Owner.

3.9 PAINT SYSTEMS

- A. General:
 - 1. Only major areas are scheduled, but miscellaneous and similar items and areas within room or space shall be treated with suitable system.
 - 2. This Specification shall serve as guide and is meant to establish procedure and quality. Confer with the Architect to determine exact finish desired.
 - 3. Number of coats scheduled is minimum. Additional coats shall be applied at no additional cost as required to hide base material completely, produce uniform color, and provide required and satisfactory finish.
- B. Gloss and Sheen Ratings: Paint gloss shall be defined as the sheen rating of applied paint, in accordance with the following limits in conformance with Master Painters Institute, Inc. (MPI) Standards according to ASTM D523. Not all of the Gloss Levels are necessarily scheduled or used on this Project.

Gloss Level	Description	Units @ 60 degrees	Units @ 85 degrees
G1	Matte or Flat finish	0 to 5	10 max.
G2	Velvet finish	0 to 10	10 to 35
G3	Eggshell finish	10 to 25	10 to 35
G4	Satin finish	20 to 35	35 min.
G5	Semi-Gloss finish	35 to 70	
G6	Gloss finish	70 to 85	
G7	High-Gloss finish	> 85	

C. Clarification of System Terminology:

1. Interior paint Systems are specified and identified herein by initial letters "INT."
2. Exterior paint Systems are specified and identified herein by initial letters "EXT."
3. The numbers following "INT" and "EXT" for each System identifies the substrate to be coated.
4. Initial numbers for each System identify the substrate to be coated summarized as follows with further clarification included with the System description:

CODE	DESCRIPTION
3.1	Concrete
3.2	Cement Plaster
4	Masonry
5	Metal
6	Wood
9.2	Gypsum Board
9.3	Acoustical Panels and Tile

5. The letter following substrate number identifies the general finish coat chemistry summarized as follows:

CODE	DESCRIPTION
A	Standard acrylic
B	Non-bridging vinyl acrylic
C	Epoxy-like acrylic
D	Semi-transparent stain
E	Elastomeric
F	High performance epoxy-like acrylic
G	Lacquer
H	Aliphatic urethane
I	Fire Retardant Intumescent
J	Acrylic Urethane
K	PVA primer
L	Acrylic primer
M	Premium performance acrylic polymer

6. Hyphenated suffix identifies the topcoat gloss level.

PAINTING
SECTION 09 9100
3595001

3.10 INTERIOR PAINTING SYSTEMS

INT 5.1A-5

Acrylic on Exposed Steel, Not Shop Primed - Gloss Level 5

1 coat	5725 DTM	Acrylic Primer
2 coats	1050 Premium Professional	Latex Semi-Gloss

Note: Modify scheduled finish coat if lower gloss level is selected by Architect.

INT 5.2A-5

Acrylic on Shop Primed Metal Including Hollow Metal Doors & Frames - Gloss Level 5

2 coats	1050 Premium Professional	Latex Semi-Gloss
---------	---------------------------	------------------

Note: Modify scheduled finish coat if higher or lower gloss level is selected by Architect.

INT 5.2M-6

Premium Performance Acrylic on Exposed Metal - Gloss Level 6

1 coat	Devacryl 1440	Waterborne Acrylic
2 coats	Devacryl 1449	100% Acrylic-Gloss

INT 9.2A-1

Acrylic on Gypsum Board - Gloss Level 1; at theater stage

1 coat	971 AcryPlex	PVA Primer/Sealer
2 coats	Speedhide 6-753 by PPG Architectural Finishes	Acrylic Latex Flat Black

INT 9.2A-3

Acrylic on Gypsum Board, textured finish - Gloss Level 3

1 coat	971 AcryPlex	PVA Primer/Sealer
2 coats	1010 Premium Professional	Latex Eggshell

INT 9.2A-5

Acrylic on Gypsum Board, smooth finish - Gloss Level 5

1 coat	971 AcryPlex	PVA Primer/Sealer
2 coats	1050 Premium Professional	Latex Semi-Gloss

Note: Provide additional topcoat at toilet rooms and food service areas.

INT 9.3B-1

Acrylic on Acoustic Panels and Tiles - Gloss Level 1

1 coat	1005 Ceiling Paint	Non-Bridging Vinyl Acrylic Flat
--------	--------------------	---------------------------------

3.11 EXTERIOR PAINTING SYSTEMS

EXT 3.2A-2

Acrylic on Cement Plaster - Gloss Level 2

1 coat	247 AcryShield	Acrylic Masonry Primer
2 coats	1210 Premium Professional	100% Acrylic Low Sheen

EXT 5.1A-5

Acrylic over Unprimed Steel - Gloss Level 5

1 coat	5725 DTM	Metal Primer
2 coats	1215 Premium Professional	100% Acrylic Semi-Gloss

EXT 5.2A-5

Acrylic over Shop Primed Metal Doors and Frames, Steel Frame, Mechanical and Electrical Equipment, and Panels - Gloss Level 5

2 coats	2888 DuraPoxy HP	Acrylic Urethane Semi-Gloss
---------	------------------	-----------------------------

EXT 5.3A-5

Premium Acrylic over Waterborne Primer on Galvanized Metal – Gloss Level 5

Pretreatment	SSPC SP-1	Heavy-duty cleaner
1 coat	5725 DTM	Acrylic Primer
2 coats	1215 Premium Professional	100% Acrylic Semi-Gloss

Note: Provide pretreatment and primer if preparation and primer not applied in shop.

EXT 5.4A-5

Acrylic over Waterborne Primer on Aluminum – Gloss Level 5

Pretreatment	Devco Devprep 88	Heavy-duty cleaner
1 coat	5725 DTM	Acrylic Primer
2 coats	1215 Premium Professional	100% Acrylic Semi-Gloss

Note: Provide pretreatment and primer if preparation and primer not applied in shop.

3.12 MISCELLANEOUS PAINTING

- A. Mechanical and Electrical Equipment, Conduits and Piping: Paint exposed items as scheduled using appropriate system for material and whether or not item has been factory-primed.
- B. Exposed Insulation-Covered Piping: Size with Arabol, or equal latex type adhesive, and apply 2 coats of semi-gloss enamel.
- C. Material Visible through Grilles, Screens, Louvers, Vents and Screens and Exposed Hardware Cloth Screening: Painted flat black to make them as unnoticeable as possible.
- D. Mechanical Equipment: Paint mechanical equipment housings where indicated on the Drawings.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Metal-framed porcelain enamel markerboards.
 - 2. Horizontal sliding markerboards.

1.2 RELATED REQUIREMENTS

- A. Section 01 6116, Volatile Organic Compound (VOC) Restrictions; for VOC limits pertaining to adhesives, sealants, fillers, primers, and coatings.
- B. Section 01 8113, Sustainable Design Requirements, for CAL-Green general requirements and procedures.
- C. Section 12 3216, Manufactured Plastic-Laminate-Clad Casework.

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CAL Green), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Submittal Procedures:
 - 1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
 - 2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Contract Closeout and Final Cleaning.
 - 3. Sustainable Design Submittals shall comply with the additional requirement of Section 01 8113, Sustainable Design Requirements.

1.5 ACTION SUBMITTALS

- A. Shop Drawings: Submit showing all parts, connections and anchorages, adjacent materials, fully dimensioned and noted. Include in-wall blocking requirements.
- B. Product Data: Manufacturer's complete descriptive data of all products proposed for use. Include manufacturer's specifications, installation instructions, and maintenance instructions.
- C. Samples: The following samples are required.
 - 1. Submit sample for each type of board and trim components to Architect for review.

MARKERBOARDS
SECTION 10 1116
3595001

2. Manufacturer's full range of colors for Architect's selection.

1.6 INFORMATIONAL SUBMITTALS

A. Sustainable Design:

1. General:
 - a. Submit information necessary to establish and document compliance with the California Green Building Standards Code.
 - b. Sustainable design submittals are in addition to other submittals.
2. The following information shall be provided:
 - a. Adhesives and Sealants: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.
 - b. Composite Wood: Evidence of compliance that products meet formaldehyde limits of current CARB Airborne Toxic Control Measure (ATCM) as specified in Section 01 6116.

B. Sample of manufacturer's warranty.

1.7 CLOSEOUT SUBMITTALS

- A. Warranty/Guarantee: Submit executed warranty and Subcontractor's guarantee.

1.8 QUALITY ASSURANCE

- A. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.
- B. Single Source Responsibility: Use materials and products of one manufacturer whenever possible.
- C. Materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.

1.9 DELIVERY, STORAGE AND HANDLING

- A. Deliver undamaged products to job in manufacturer's sealed containers and/or original bundles with tags and labels intact.
- B. Store materials in protected, dry conditions off of ground and in areas so as to not interfere with the progress of the work.
- C. Transport, store and handle in strict accord with the manufacturer's written recommendations.

1.10 WARRANTY

- A. Manufacturer: In addition to the Contractor's and Subcontractor's Guarantee, furnish Owner with the following manufacturer's fully executed written warranties against defects in materials and workmanship including against warping of sliding panel units.

1. Dry Erase Markerboards: Lifetime of the building.
2. Other Products: As available from the manufacturer.

PART 2 - PRODUCTS

2.1 DESIGN AND PERFORMANCE CRITERIA

- A. Sustainable Design:
1. VOC emissions for field-applied adhesives, sealants, and sealant primers must comply with limits specified in Section 01 6116.
 2. Composite wood products must meet current formaldehyde emission limits of CARB Airborne Toxic Control Measure (ATCM) as specified in Section 01 6116.

2.2 HORIZONTAL SLIDING MARKERBOARDS

- A. Manufacturer and Product: Top hung sliding panels and fixed back panels; "Horizontal Sliding Units" by Claridge Products and Equipment, Inc., 800-434-4610 as specified, or equal.
1. Frame: Frame and exposed metal members to be of 6063-T5 alloy, anodized satin finish, aluminum extrusions.
 2. Tray: 2-3/4 inch deep aluminum tray with end closures.
 3. Map Rail: Full length aluminum map rail with cork insert furnished with one combination hook/clip for each 24 inch of length and two flag holders.
 4. Hardware: Rolling hardware to be nylon tipped, ball bearing rollers of sufficient size and number to enable smooth and easy operation of panels.
 5. Tracks: As standard with manufacturer for number of panels at each configuration.
 6. Panel Finish: Sliding panel units and back fixed panel shall be specified markerboard.
 7. Dimensions:
 - a. Overall Size: Typical units, unless indicated otherwise, shall be 3 panels 7'-0" wide x 4'-0" high each.
 - b. Where other sizes are shown, markerboards within sliding Units shall not exceed 5'-6" in width.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Prior to installation, carefully examine and verify that the installed work of all other trades is complete to the point where this installation may properly commence.
- B. Verify that specified items may be installed in accord with the approved designs.
- C. In the event of discrepancy, immediately notify Architect. Do not proceed in discrepant areas until discrepancies have been fully resolved.

MARKERBOARDS

SECTION 10 1116

3595001

3.2 INSTALLATION – MARKERBOARDS

- A. Install items where indicated on the Drawings, in full accord with all reviewed shop drawings and the manufacturer's recommendations, anchoring components firmly in place for long life under hard use.

3.3 PROTECTION

- A. Protect work and materials of this Section prior to and during installation, and protect the installed work and materials of other trades.
- B. In the event of damage, make all repairs and replacements necessary to the approval of the Architect at no additional cost to the Owner.

END OF SECTION

*p:\sacramento\3595 tracy unified school district\001-000_villalovoz es new shade structures\08 specifications\06 spec\04
final\bohn\10 1116_markerboards.docx
Last Updated: March 30, 2021*

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Code required signage.
 - 2. Exterior building identification and other non-code signage.

1.2 RELATED REQUIREMENTS

- A. Section 01 6116, Volatile Organic Compound (VOC) Restrictions; for VOC limits pertaining to adhesives, sealants, fillers, primers, and coatings.
- B. Section 01 8113, Sustainable Design Requirements, for CAL-Green general requirements and procedures.
- C. Division 26, Electrical.
- D. Signage requirements included on the Drawings.

1.3 REFERENCES AND STANDARDS

- A. California Building Code, edition as noted on the drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CAL Green), edition as noted on drawings, as adopted by the California Division of the State Architect (DSA).
- C. Title 19, CCR, Article 33.01(i).
- D. American National Standards Institute (ANSI):
 - 1. A-117.1: Accessible and Usable Buildings and Facilities.
- E. ASTM International (ASTM):
 - 1. A53/A53M: Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
 - 2. A153/A153M: Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Submittal Procedures:
 - 1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.

SIGNAGE
SECTION 10 1400
3595001

2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
3. Sustainable Design Submittals shall comply with the additional requirement of Section 01 8113, Sustainable Design Requirements.

B. Coordination:

1. Prior to production of shop drawings and samples, coordinate a pre-submittal conference with Architect to confirm submittal requirements, schedule, and sign review process.
2. For signs supported by or anchored to permanent construction, advise installers of anchorage devices about specific requirements for placement of anchorage devices and similar items to be used for attaching signs. Provide template for placement of sign-anchorage devices and electrical service embedded in permanent construction by other installers.

1.5 ACTION SUBMITTALS

A. Shop Drawings:

1. Scaled drawings and signage schedule for each sign indicating materials, lettering layout, and colors.
2. Large-scale drawing and details of custom logo and lettering. Include mounting details.
 - a. Include plans, elevations, and large-scale sections of typical members and other components.
 - b. Show mounting methods, grounds, mounting heights, layout, spacing, reinforcement, accessories, and installation details.
3. Font Style. 18 point graphical example of alphabet and numerical numbers 0 through 9 of signage font style, upper and lower case letters, punctuation, 18 point scale, and black text on white paper.

B. Product Data: Submit list and complete descriptive data of all products proposed for use. Include manufacturer's specifications, published warranty or guarantee, installation instructions, and maintenance instructions.

C. Samples:

1. Submit three samples of specified signage fonts to be used for visual and tactile characters including braille below the raised characters.
2. Color Verification: Provide physical sample of each available color from the manufacturer. Include color system name and serial number, code and name as applicable.
3. Control Samples. Samples shall be prepared on same base material to be used in fabrication. Submit one sample of each sign type. Signage types are indicated in Construction Document details. Interior signs shall be full size.

4. Dimensional Letters: One full-size representative samples of each dimensional letter type required, showing letter style, color, and material finish and method of attachment.
5. Symbol of Accessibility and Pictograms. Full scale sample of pictograms and symbol of accessibility to be used on sign panels and graphics.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For installer.
- B. Sustainable Design:
 1. General:
 - a. Submit information necessary to establish and document compliance with the California Green Building Standards Code.
 - b. Sustainable design submittals are in addition to other submittals.
 2. The following information shall be provided:
 - a. Adhesives and Sealants: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.
- C. Sample of manufacturer's warranty.
- D. Signage Schedule and Alphanumeric Nomenclature. As a component of shop drawings and informational submittals, verify with Architect the sign nomenclature; room names and numbers; wording of way-finding, directional and informational signage; text; and orientation of wayfinding pictorial graphics.

1.7 CLOSEOUT SUBMITTALS

- A. Warranty/Guarantee: Submit executed warranty and Subcontractor's guarantee.
- B. Maintenance data for signs and sign types including maintenance manuals.

1.8 QUALITY ASSURANCE

- A. Contractor shall assure that the vendor shall be responsible for the quality of materials and workmanship of any firm acting as the vendor's subcontractor.
- B. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.
- C. Use materials and products of one manufacturer whenever possible.
- D. Materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.
- E. The adhesion of inlaid letters and symbols will be tested. See Article WARRANTY.
- F. Mockups:

SIGNAGE
SECTION 10 1400
3595001

1. Prior to installation, provide a taping pattern for sign plaques.

1.9 DELIVERY, STORAGE AND HANDLING

- A. Deliver undamaged products to job in manufacturer's sealed containers and/or original bundles with tags and labels intact.
- B. Store materials in protected, dry conditions off of ground and in areas so as to not interfere with the progress of the work.
- C. Transport, store and handle in strict accord with the manufacturer's written recommendations.

1.10 FIELD MEASUREMENTS

- A. Make and be responsible for all field dimensions necessary for proper fitting and completion of work. Report discrepancies to Architect before proceeding.

1.11 WARRANTY

- A. Manufacturer: In addition to the Contractor's and Subcontractor's Guarantee, furnish Owner with manufacturer's available fully executed written warranty for signage against all defects in materials and workmanship, including without limitation against yellowing, cracking, crazing, and other visible and performance defects for a period of 5 years.
 1. Text, pictograms or symbols that can be removed from the sign face utilizing a sharp object or other conventional methods will be considered a manufacturing defect.

PART 2 - PRODUCTS

2.1 DESIGN AND PERFORMANCE CRITERIA

- A. Regulatory Standards:
 1. Except as otherwise specified or shown, signage shall conform to the following:
 - a. ANSI A-117.1 and the Americans with Disabilities Act (ADA).
 - b. ATBCB Design Guidelines for Signage in relation to the Americans with Disabilities Act.
 - c. California Code of Regulations, Titles 19 and 24.
 - 1) Contracted Grade 2 Braille shall be used whenever Braille symbols are specifically required. Refer to CBC Section 11B-703.3.
 - 2) All signage shall conform to 2022 CBC Section 11B-703.
 - d. Uniform Sign Code.
 2. When there is a conflict between the CBC and ADA, comply with the most stringent.
- B. Design Criteria: Refer to Chapter 11B of the California Building Code.

1. Raised Characters: Section 11B-703.2.
 - a. Depth: Section 11B-703.2.1.
 - b. Case: Section 11B-703.2.2.
 - c. Style: Section 11B-703.2.3.
 - d. Character Proportions: Section 11B703.2.4.
 - e. Character Height: Section 11B-703.2.5.
 - f. Stroke Thickness: Section 11B-703.2.6.
 - g. Character Spacing: Section 11B-703.2.7.
 - h. Line Spacing: Section 11B-703.2.8.
 - i. Installation Height and Location: Section 11B-703.4.
 2. Braille: Section 11B-703.3.
 - a. Contracted (Grade 2) Braille with rounded or domed dots shall be used wherever Braille is required.
 - 1) Braille dimensions in accordance with Table 11B-703.3.1.
 3. Visual Characters: Section 11B-703.5.
 - a. Character Proportions: Section 11B-703.5.4.
 - b. Stroke Thickness: Section 11B-703.5.7.
 - c. Character Spacing: Section 11B-703.5.8.
 - d. Line Spacing: Section 11B-703.5.9.
 4. Pictograms: Section 11B-703.6.
 - a. Pictogram Field: 11B-703.6.1.
 - 1) Characters and Braille shall not be located in the pictogram field.
 - b. Finish and Contrast: Section 11B-703.6.2.
 - 1) Pictograms and their field shall have a non-glare finish. Pictograms shall contrast with their field with either a light pictogram on a dark field or a dark pictogram on a light field.
 - c. Text Descriptors: Section 11B-703.6.3.
 - 1) Locate text descriptors directly below the pictogram field.
 - 2) Text shall be raised characters with braille directly below.
 5. International Symbol of Accessibility: Section 11B-703.7.2.1.
 6. Toilet Room Door Symbols: Section 11B-703.7.2.6.
 7. Tactile Exit Signs: Tactile exit signage to comply with 1013.4 and 11B-703.4.
- C. Sustainable Design:
1. VOC emissions for field-applied adhesives, sealants, and sealant primers must comply with limits specified in Section 01 6116.

2.2 PLASTIC SIGNS - TACTILE

- A. Materials, Unless Otherwise Noted:

SIGNAGE
SECTION 10 1400
3595001

1. Manufacturer and Product: "Inlaid Tactile Sign" by Accent Signage Systems, Inc. Minneapolis, MN, 800-215-9437 as specified and the basis of design; Ellis & Ellis Sign Systems, Sacramento, CA, 916-924-1936; ASI-Modulex, Los Altos, CA, 650-940-1354; Weidner Architectural Signage, Sacramento, CA; or equal.
 - a. Sign Face: Two 1/8-inch plies with eased edges; New Hermes "Gravo-Tac," or equal.
 - 1) Total Thickness: 1/4 inch.
 - 2) Painted signs will not be accepted.
 - b. Tactile Text: Provide tactile text and "Raster" Braille at plastic tactile signage.
 - 1) Tactile text shall be inlaid into sign face 1/32-inch and raised 1/32- inch minimum above sign face surface.
 - 2) Inlaid text shall be 1-ply, 1/16-inch thick material; "Gravo-Tac" Exterior or equal.
 - 3) Provide text and graphics precisely formed, uniformly opaque to comply with relevant ADA regulations and requirements indicated for size, style, spacing, content, position and colors.
 - 4) Symbols where specified shall be International Style.
 - 5) Braille shall be Contracted (Grade 2) Braille.
 - a) Dots shall be 0.10-inch on centers in each cell, 0.30-inch on center between corresponding dots in adjacent cells, and 0.395-inch minimum to 0.400-inch maximum on center between corresponding dots in cell directly below.
 - b) Dots shall be raised a minimum of 0.025-inch and a maximum of 0.037-inch above the background, and a base diameter of 0.059-inch minimum and 0.063- inch maximum.
 - c) Dots with straight sides and flat tops are not acceptable.
 - c. Colors: High contrast, non-glare, integral colors for graphics.
 - 1) Integral materials shall be U.V. stabilized.
 - 2) Characters, symbols and pictograms shall be in high contrast (light color) with background (dark) color and must conform to the CBC and the ADA Standards.

B. Fabrication:

1. Panel Appearance: Manufacturer's standard, high contrast, semi-matte colors.
2. Surface Texture: Matte Non-glare.
3. Character Style, Size and Layout Position:
 - a. Characters shall be 1-inch high, unless otherwise indicated.
 - b. The stroke of the uppercase letter "I" shall be 15 percent maximum of the height of the character.
 - c. The width of the uppercase letter "O" shall be 60 percent minimum and 110 percent maximum of the height of the uppercase letter "I".

SIGNAGE
SECTION 10 1400
3595001

- d. Character style to be Sans Serif, uppercase, accompanied by Braille directly below text at all locations where raised characters are required.
 - e. Spacing between baselines of separate lines of raised characters with a message shall be 135 percent minimum and 170 percent maximum of the raised character height.
 - 4. Text Schedule: Confirm text, symbols and numbering with the Architect and Owner.
 - 5. Sign Size: As indicated on the Drawings or, if not shown, as reasonably required to accommodate text, symbols and Braille.
 - a. Where signs are installed on window glazing, fabricate a blank sign back to match in size and shape to sign.
 - b. Sign backs shall cover back side of sign from view through window on opposite side of sign.
 - c. Signs that are mounted back-to-back on glazing are to be matching in size; the smaller sign is to be increased in size as reasonably required to match the larger sign.
 - 6. Sign Shape: As indicated on the Drawings.
 - a. Corners: Radiused, unless otherwise shown.
 - 7. Inlaid Letter Adhesion Process: Inlaid material shall be adhered into 1/32-inch deep routed sign face utilizing the heat and pressure bonded/chemically welded process as developed by Accent Signage Systems for the specified "Inlaid Tactile Sign."
 - a. Sign manufacturers for the specified "Inlaid Tactile Sign" shall be familiar with and utilize the exact same manufacturing process developed by Accent Signage Systems.
 - b. Manufacturer must utilize the same and required equipment, products and techniques necessary to produce authentic "Inlaid Tactile Signs" as developed by Accent Signage Systems.
 - c. Other adhesive products and methods, including applied adhesive tapes will not be accepted.
- C. Sign Types: Provide braille translation directly below the raised characters.
- 1. Room Identification Sign: Provide as shown on the Drawings.
 - a. Provide name and room number at each door indicated.
 - b. Names and numbers to be reviewed and approved by Architect and Owner prior to fabrication.
 - c. Allow an average of 4-numbers and 14-letters for each sign.
 - d. Sign to be provided adjacent to doors as shown.
 - 2. Toilet Room Identification Sign: In addition to the specified Door Symbol, provide a Toilet Room Identification Sign at the strike side of every toilet room door.
 - a. Sign shall include an International Symbol of Accessibility, pictogram, and raised characters, specifying the room name with Braille translation below pictogram.
 - 3. Tactile Exit Sign:

SIGNAGE
SECTION 10 1400
3595001

- a. Provide with text in raised characters to read: "EXIT".

2.3 PLASTIC SIGNS - NON-TACTILE

A. Materials, Unless Otherwise Noted:

Manufacturer and Product: Acrylic panel sign as manufactured and distributed by Ellis & Ellis Sign Systems, 916-924-1936, as specified and the basis of design, or equal.

1. Sign Face: 1/4-inch, matt finish, non-glare acrylic with subsurface vinyl and paint. Painted faces will not be accepted.
2. Colors: Colors shall match specified Tactile Signs and as selected by Architect and Owner.
 - a. Integral materials shall be U.V. stabilized.
 - b. Graphics and text shall be in high contrast (dark color) with background (light) color.

B. Fabrication:

1. Sign Thickness: 1/4-inch.
2. Character Style, Size and Layout Position:
 - a. Characters shall be a minimum of 1-inch high, unless otherwise indicated.
 - b. The stroke thickness of the uppercase letter "I" shall be 10 percent minimum and 20 percent maximum of the height of the character.
 - c. The width of the uppercase letter "O" shall be 60 percent minimum and 110 percent maximum of the height of the uppercase letter "I".
 - d. Letter style to be Sans Serif, uppercase.
 - e. Space characters 10 percent minimum and 35 percent maximum of height of characters, measured between two closest points of adjacent characters, excluding word spaces.
 - f. Spacing between baselines of separate lines of characters within a message shall be 135 percent minimum and 170 percent maximum of character height.
3. Text Schedule: Confirm text, symbols and numbering Architect and Owner using the shop drawing/submittal process.
4. Sign Size: As indicated on the Drawings or, if not shown, as reasonably required to accommodate text and symbols.
 - a. Where signs are installed on window glazing, fabricate a blank sign back to match in size and shape to sign.
 - b. Sign backs will cover back side of sign from view through window on opposite side of sign.
5. Sign Shape: As indicated on the Drawings or, as reasonably required to accommodate the specified text and size at lettering.
 - a. Corners: 1/4-inch radius, unless otherwise shown.

C. Sign Types:

1. Toilet Room Door Symbol: Provide one of the following symbols as appropriate to the toilet room type. Toilet Room Door Symbols shall have a color contrast that is distinctly different from the color of the door. Characters, as shown, to be flush with face of symbol. The entire background color must contrast with door. A thin contrasting border around the symbol, with remainder of sign background in a non-contrasting color is not allowed.
 - a. Girls: 12-inch diameter circle, with eased edges.
 - b. Boys: Equilateral triangle with sides 12-inches long, with eased edges.
 - c. Women: 12-inch diameter circle, with eased edges.
 - d. Men: Equilateral triangle with sides 12-inches long, with eased edges.
 - e. Unisex or Staff: equilateral triangle of contrasting color and super imposed on and geometrically inscribed within the face of 12-inch diameter circle, which is a contrasting color to the door. The vertices of the triangle symbol shall be located $\frac{1}{4}$ -inch maximum from the edge of the circle with the vertex pointing upward. Both the circle and triangle to have eased edges.
2. Occupancy Signs (Capacity Sign): Quantity of occupants shall be as indicated on the Drawings or as provided by Architect. Text to read as follows:
 - a. Maximum Number - General: "The number of people permitted in this room shall not exceed _____ by order of the Division of the State Architect."
 - b. Rooms Used for Assembly and Dining: "The number of people permitted in this room shall not exceed _____ for Assembly and _____ for Dining by order of the Division of the State Architect."
3. Assistive Listening System Sign: Provide as indicated on the Drawings.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Prior to installation, carefully inspect and verify that the installed work of other trades is complete to the point where this installation may properly commence.
- B. Verify that specified items may be installed in accordance with the approved design.
- C. In the event of discrepancy, immediately notify Architect. Do not proceed in discrepant areas until discrepancies have been fully resolved.

3.2 INSTALLATION OF SIGNS

- A. General: Locations of signs must be in accordance with the Drawings and approved shop drawings.
- B. Plastic Signs:
 1. General:
 - a. Provide both mechanical fasteners and either adhesive or 2-sided adhesive tape as recommended by manufacturer for given mounting substrate.

SIGNAGE
SECTION 10 1400
3595001

- b. Fasteners: Minimum 4-recessed flush head tamper-proof (vandal-resistant) screws per sign.
- 2. Wood and Metal Framed Walls: Mechanical fasteners shall be of adequate length to penetrate exterior finishes and provide secure embedment into wall structure or sheathing.
- 3. Concrete Walls:
 - a. Use vinyl tape and mounting holes for countersunk, vandal-proof expansion anchors (use both).
- 4. Glass:
 - a. Utilize mounting adhesive and silicone where signs are mounted to glass.
 - b. Provide vinyl window sign backer to match sign face size, mounted on opposite side of glass.
 - c. Signs mounted back-to-back are to be matching in size.
 - d. Do not pre-drill signs for mechanical fastening where sign is to be mounted to glass.
- C. Other Signs: Use mounting method that is permanent, vandal resistant, and has been approved by the Architect.

3.3 PROTECTION

- A. Protect work and materials of this Section and other Sections prior to and during installation, and protect the installed work and materials of all other trades.
- B. In the event of damage, immediately make all repairs and replacements necessary to the approval of the Architect and at no additional cost to the Owner.

3.4 ADJUSTING AND CLEANING

- A. Remove all dust, dirt, finger marks, etc. from signs and letters using cleaning methods as recommended by manufacturer.

END OF SECTION

*p:\sacramento\3595 tracy unified school district\001-000_villalovoz es new shade structures\08 specifications\06 spec\04
final\bohn\10 1400_ signage.docx
Last Updated: March 30, 2021*

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Toilet accessories.

1.2 RELATED REQUIREMENTS

- A. Division 26, Electrical.

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CAL Green), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Submittal Procedures:
 - 1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
 - 2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
- B. Coordination: Coordinate with other trades as required to ensure proper and adequate provision in framing and wall finish for the installation of the selected toilet accessories in the locations required including recessed items)

1.5 ACTION SUBMITTALS

- A. Shop Drawings: Submit showing parts, connections and anchorages, adjacent materials, fully dimensioned and noted.
- B. Product Data: Submit list of each required accessory and complete descriptive data of products proposed for use. Include manufacturer's specifications, published warranty, installation instructions, and maintenance instructions.

1.6 INFORMATIONAL SUBMITTALS

- A. Sample of manufacturer's warranty.

1.7 CLOSEOUT SUBMITTALS

- A. Warranty/Guarantee: Submit executed warranty and Subcontractor's guarantee.

TOILET ACCESSORIES
SECTION 10 2813
3595001

- B. Keys for lockable accessories.
- C. Maintenance data and operating instructions.

1.8 QUALITY ASSURANCE

- A. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.
- B. Use materials and products of one manufacturer whenever possible.
- C. All materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.

1.9 DELIVERY, STORAGE AND HANDLING

- A. Deliver undamaged products to job in manufacturer's sealed containers and/or original bundles with tags and labels intact.
- B. Store materials in protected, dry conditions off of ground and in areas so as to not interfere with the progress of the Work.
- C. Transport, store and handle in strict accord with the manufacturer's written recommendations.

1.10 FIELD CONDITIONS

- A. Make and be responsible for field dimensions necessary for proper fitting and completion of Work. Report discrepancies to Architect before proceeding.
- B. Verify wall depths are adequate for each item prior to ordering. Notify Architect of conflicts or discrepancies.

1.11 WARRANTY

- A. Manufacturer: In addition to the Contractor's and Subcontractor's Guarantee, furnish Owner with manufacturer's fully executed written warranty for toilet accessories against defects in materials and workmanship, agreeing to replace and install toilet accessories at no additional cost to the Owner, within warranty period as follows:
 - 1. For a period of 3 years.

PART 2 - PRODUCTS

2.1 OWNER FURNISHED CONTRACTOR INSTALLED PRODUCTS

- A. The following products will be furnished by the Owner for installation by Contractor. Provide adequate blocking for attachment. Miscellaneous items are to be provided and installed by Contractor.

1. Toilet Tissue Dispensers.

2.2 DESIGN AND PERFORMANCE CRITERIA

- A. Conform to applicable requirements of ADA and CBC for accessibility. When in conflict, conform to the most stringent.

2.3 MANUFACTURERS

- A. Accessories: Bobrick Washroom Equipment Inc. or Bradley Corporation as specified and the basis of design, unless otherwise noted, or equal.
 1. Manufactured accessories not specified shall require approval as a substitution to be considered equal. Refer to substitution requirements specified in Section 01 3300, Submittal Procedures.
 2. Although multiple manufacturers may be specified for a specific accessory, all accessories shall be the product of a single manufacturer, unless otherwise specified or approved.

2.4 MANUFACTURED UNITS

- A. Grab Bars: 18 gauge 1-1/2 inch outside diameter, type 304 stainless steel welded to 1/8 inch type 304 solid stainless steel wall plates; Bobrick Series B-6806, Bradley 812 Series, or equal.
 1. Configurations and Lengths: As shown.
 2. Grab bar shall withstand a 250 pound point load.
 3. Joints ground and polished.
 4. Finish on Exposed Surfaces: Satin.
 5. Fastening: Concealed, vandal resistant.

2.5 FASTENINGS

- A. Toilet accessories shall be complete with required fastenings.
- B. Fastenings shall either harmonize with the item being fastened, or be of the concealed type.
- C. Exposed fastenings shall be theft and vandal-resistant.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Prior to installation of the Work of this Section, carefully inspect and verify that the installed Work of other trades is complete to the point where this installation may properly commence.
- B. Verify that specified items may be installed in accordance with the approved design.

TOILET ACCESSORIES
SECTION 10 2813
3595001

- C. In the event of discrepancy, immediately notify the Architect. Do not proceed in discrepant areas until discrepancies have been fully resolved.

3.2 PREPARATION

- A. The Contractor shall provide recesses, anchorage and back-up blocking in sizes and in locations as required for proper installation of accessories. Coordinate with other trades where necessary to make provisions for installation.
- B. Securely anchor items in place in locations and at mounting heights indicated. Where specific dimensions are not noted, installation shall be approved by the Architect.
- C. Securely fasten grab bar mounting plates to solid framing or blocking, in accordance with CBC.
- D. Provide cut-outs in toilet partitions for napkin disposal units as required.

3.3 INSTALLATION

- A. Install fixtures, accessories and items in accordance with manufacturers' printed instructions and requirements in the 2022 CBC 11B-603.5 where shown or as approved by Architect.
- B. Mount surface-mounted accessories to solid backing or blocking.
- C. Install plumb and level, securely and rigidly anchored to substrate.
- D. Use concealed vandal-resistant fastenings wherever possible.
 - 1. Adhesive installation not permitted.
 - 2. Provide anchors, bolts and other necessary fasteners, and attach accessories securely to walls or toilet partitions as recommended by manufacturer for each item and each type of substrate condition.
- E. Grab bars: Solidly anchor grab bars to withstand minimum downward pull of 500 pounds between any 2 supports after installation.
- F. Verify type, location and attachment methods of items furnished by Owner to ensure proper preparation of substrate for solid attachment of accessories.
- G. Sealants: Comply with requirements of Section 07 9200, Joint Sealants.
 - 1. Apply behind toilet accessories as necessary to ensure sanitary and watertight integrity of surfaces.
 - 2. Conceal sealants.

3.4 CLEANING AND ADJUSTING

- A. Upon completion of installation, remove manufacturer's temporary labels, marks of identification.
- B. Thoroughly wash surfaces, remove foreign materials, polish surfaces.

TOILET ACCESSORIES
SECTION 10 2813
3595001

- C. Leave entire accessories in neat, orderly, clean, acceptable condition as approved.
- D. Replace damaged parts, surfaces which are not free from imperfections.

3.5 PROTECTION

- A. Protect Work and materials of this Section prior to and during installation, and protect the installed Work and materials of other trades.
- B. In the event of damage, make repairs and replacements necessary to the approval of the Architect at no additional cost to the Owner.
- C. Exposed finish shall be free from scratches, dents, permanent discolorations and other defects in workmanship or material.

END OF SECTION

*p:\sacramento\3595 tracy unified school district\001-000_villalovoz es new shade structures\08 specifications\06 spec\04
final\bohn\10 2813_toilet accessories.docx
Last Updated: April 1, 2021*

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Fire extinguishers, hangers and cabinets.
 - 2. Fire hose and extinguisher cabinet.

1.2 RELATED REQUIREMENTS

- A. Section 09 9100, Painting.

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CAL Green), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Submittal Procedures:
 - 1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
 - 2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.

1.5 ACTION SUBMITTALS

- A. Shop Drawings: Submit showing all parts, connections and anchorages, adjacent materials, fully dimensioned and noted. Include in-wall blocking requirements.
- B. Product Data: Submit list and complete descriptive data of all products proposed for use. Include manufacturer's specifications and installation instructions.

1.6 INFORMATIONAL SUBMITTALS

- A. Statement that all extinguishers and cabinets comply with the current applicable UL and NFPA classifications and ratings.
- B. Sample of manufacturer's warranty.

1.7 CLOSEOUT SUBMITTALS

- A. Written instructions to Owner's personnel in the operation, maintenance and charging of the fire extinguishers furnished.

FIRE EXTINGUISHERS AND CABINETS
SECTION 10 4416
3595001

- B. Warranty/Guarantee: Submit executed warranty and subcontractor's guarantee.

1.8 QUALITY ASSURANCE

- A. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.
- B. Single-Source Responsibility: Use materials and products of one manufacturer.
- C. Materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.
- D. Equipment shall be approved by Underwriters' Laboratories, Inc., bear UL Label and be approved by the State Fire Marshal.

1.9 DELIVERY, STORAGE AND HANDLING

- A. Deliver undamaged products to job in manufacturer's sealed containers and/or original bundles with tags and labels intact.
- B. Store materials in protected, dry conditions off of ground and in areas so as to not interfere with the progress of the work.
- C. Transport, store and handle in strict accord with the manufacturer's written recommendations.

1.10 FIELD MEASUREMENTS

- A. Make and be responsible for all field dimensions necessary for proper fitting and completion of work. Report discrepancies to Architect before proceeding.

1.11 WARRANTY

- A. Manufacturer: In addition to the Contractor's and Subcontractor's Standard Guarantee, furnish Owner with manufacturer's fully executed written warranty for fire extinguishers against defects in materials and workmanship for a period of not less than 5 years.

PART 2 - PRODUCTS

2.1 DESIGN AND PERFORMANCE CRITERIA

- A. Conform to all applicable standards of the National Fire Protection Association (NFPA) and California State Fire Marshal (CSFM) for fire extinguisher cabinets and locations.

2.2 FIRE EXTINGUISHERS

- A. Manufacturer: By same manufacturer as fire extinguisher cabinets.
- B. Types:

FIRE EXTINGUISHERS AND CABINETS
SECTION 10 4416
3595001

1. Fire extinguishers - General Use: UL Rating 3A-40BC extinguishers shall be 5-pound nominal capacity multi-purpose dry chemical type, bearing U.L. Label; finish shall be red enameled steel.
- C. Tamperseals on each extinguisher shall be of the breakable metal type, indicating accidental or unauthorized partial discharge.
- D. Pressure gauges on each extinguisher shall be of the dial type.
- E. Mounting Brackets:
 1. Manufacturer: Provide brackets from same manufacturer as fire extinguisher.
 2. Brackets shall be of quick release design, not subject to release by bumping.
 3. Bracket attachments shall be furnished with each bracket, suitable for the surface to which attachment is to be made.

2.3 FIRE EXTINGUISHER CABINETS

- A. General:
 1. Size cabinets to conform to size and number of extinguishers at each location shown on the Drawings.
- B. Manufacturer and Product: "Cosmopolitan" Series by JL Industries, Inc., a division of the Activar Construction Products Group as specified, or equal.
 1. Mounting:
 - a. Type 1: Semi-recessed with 2-1/2 inch return trim, rolled edge, for 3A-40BC fire extinguisher.
 - b. Type 3: Fully-recessed with 3/8 inch flat trim, depth as required.
 2. Door Style: S21 solid with black ABS flush (recessed) pull and continuous hinge.
 3. Latching Device: Manufacturer's standard roller catch.
 4. Finishes:
 - a. Door and Trim: Stainless steel, #4 satin finish.
 - b. Cabinet Box (Tub): Manufacturer's standard white electrostatic powder coat.
 5. Provide mounting clips, suitable for extinguishers being provided, in each cabinet.
 6. Identification: "FIRE EXTINGUISHER" in vertical red color lettering.
 7. Cabinet shall be fabricated to meet ADA and CBC projection criteria.
 8. Welded anchors to be provided appropriate to construction in which cabinet is placed.
 9. Cabinets located in fire rated walls to be "Cosmopolitan Fire FX" Option.

FIRE EXTINGUISHERS AND CABINETS
SECTION 10 4416
3595001

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Prior to installation of work of this Section, carefully inspect and verify that the installed work of all other trades is complete to the point where this installation may properly commence.
- B. Verify that specified items may be installed in accordance with the approved design.
- C. In the event of discrepancy, immediately notify Architect. Do not proceed in discrepant areas until discrepancies have been fully resolved.

3.2 PROTECTION

- A. Protect work and materials of this Section and other Sections prior to and during installation, and protect the installed work and materials of other trades.
- B. In the event of damage, immediately make all repairs and replacements necessary to the approval of the Architect and at no additional cost to the Owner.

3.3 INSTALLATION

- A. Install cabinets and extinguishers where indicated on the Drawings and as required by the local Fire Authority. Where exact location of cabinets is not indicated, locate as directed by Architect.
- B. Install cabinets in accordance with manufacturer's instructions and approved shop drawings.
- C. Install so that handle of extinguisher meets accessibility requirements.
- D. Prepare recesses in walls for cabinets as required by type and size of cabinet and style of trim and to comply with manufacturer's instructions. Provide blocking, backing and other materials necessary for proper attachment and fire rating.
- E. Anchor cabinets and brackets securely in place.
- F. Provide fire extinguisher in each fire extinguisher cabinet.

3.4 INSTALLATION OF FIRE EXTINGUISHERS

- A. Determine approximate completion date of work and then inspect, charge, and tag fire extinguishers not more than 10 calendar days before nor less than one day before actual completion of work.
- B. The installation of the specified fire extinguishers in no way relieves the Contractor from providing adequate fire protection during the course of this work.

FIRE EXTINGUISHERS AND CABINETS
SECTION 10 4416
3595001

END OF SECTION

*p:\sacramento\3595 tracy unified school district\001-000_villalovoz es new shade structures\08 specifications\06 spec\04
final\bohn\10 4416_fire extinguishers and cabinets.docx
Last Updated: September 24, 2021*

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Manual-operated horizontal louver blinds.

1.2 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CAL Green), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- C. National Fire Protection Association (NFPA):
 - 1. 701: Standard Methods of Fire Tests for Flame Propagation of Textiles and Films.
- D. California Administrative Code:
 - 1. Title 19: Public Safety.

1.3 ADMINISTRATIVE REQUIREMENTS

- A. Submittal Procedures:
 - 1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
 - 2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Contract Closeout and Final Cleaning.

1.4 ACTION SUBMITTALS

- A. Shop Drawings: Submit showing parts, connections and anchorages, adjacent materials, fully dimensioned and noted.
- B. Product Data: Submit list and complete descriptive data of products proposed for use. Include Manufacturer's specifications, published warranty or guarantee, installation instructions, and maintenance instructions.
- C. Samples: The following samples are required.
 - 1. Manufacturer's full range of colors for Architect's selection.

1.5 INFORMATIONAL SUBMITTALS

- A. Sample of manufacturer's warranty.

HORIZONTAL LOUVER BLINDS
SECTION 12 2113
3595001

1.6 CLOSEOUT SUBMITTALS

- A. Warranty/Guarantee: Submit executed warranty and Subcontractor's guarantee.

1.7 QUALITY ASSURANCE

- A. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.
- B. Use materials and products of one Manufacturer whenever possible.
- C. Materials, components, assemblies, workmanship and installation are to be observed by the Owner's Inspector of Record. Work not so inspected is subject to uncovering and replacement.
- D. Flame-resistant materials shall pass or exceed one of more of the following:
 - 1. National Fire Protection Association (NFPA) 701.
 - 2. California Administrative Code Title 19.

1.8 DELIVERY, STORAGE AND HANDLING

- A. Deliver undamaged products to job in Manufacturer's sealed containers and/or original bundles with tags and labels intact.
- B. Store materials in protected, dry conditions off of ground and in areas so as to not interfere with the progress of the Work.
- C. Transport, store and handle in strict accord with the manufacturer's written recommendations.

1.9 FIELD CONDITIONS

- A. Verify field measurements for openings to receive vertical blinds allowing proper clearances as recommended by Manufacturer to allow free rotation and traversing.
- B. Prior to shade installation, building shall be enclosed.
- C. Interior temperature shall be maintained between 60 degrees F and 90 degrees F during and after installation; relative humidity shall not exceed 80 percent. Wet work shall be complete and dry.

1.10 WARRANTY

- A. Manufacturer: In addition to the Contractor's and Subcontractor's Guarantee, furnish Owner with manufacturer's fully executed written limited lifetime warranty for the repair or replacement of horizontal louver blinds against defects in materials and workmanship.

PART 2 - PRODUCTS

2.1 PRODUCTS

- A. Model "CD80 1 Mini Aluminum Blind" as manufactured by Hunter Douglas Contract, or equal.

2.2 MATERIALS

- A. Slats: Aluminum alloy, 1 inch wide by .008 inch thick, heat-treated and spring tempered aluminum alloy 6011, with eased corners and manufacturing burrs removed. Furnish not less than nominal 15.2 slats per foot to ensure tight closure and light control.
- B. Slat Support: Braided ladders of 100 percent polyester yarn color compatible with slats and spacing of ladder no more than 20mm, reinforced to withstand 100 pound pull. Distance between ladders not to exceed Manufacturer's requirements.
- C. Headrail: U-shaped profile with rolled edges, measuring 1-3/8 inches x 1-3/8 inches x 0.024 inch constructed of corrosion-resistant steel, providing a beveled edge valance-free design. Ends to be fitted with 0.024 inch steel end lock with adjustable tab for centering blinds. Finish to be standard baked-on polyester and to match slats.
- D. Bottom Rail: Steel with corrosion-resistant finish formed with double-lock seam into closed oval shape for optimum beam and torsional strength. Ends fitted with color-coordinated engineered polymer caps. Finish to be standard baked-on polyester and to match slats.
- E. Lifting Mechanism: Crashproof steel cordlocks with corrosion-resistant finish, two-ply polyester cord filler in braided polyester jacket lift cords, cord equalizers, cordlock adapter, and cord stop / single pull cord. Install within 2022 CBC reach ranges 11B-308.
- F. Tilting Mechanism: Permanently lubricated die-cast worm and gear type tilter gear mechanism in fully enclosed housing with clutch action to protect ladder tapes from over rotation of the solid steel, corrosion resistant tilt rod.
- G. Tilt Control Wand: Tubular shaped 7/16 inch diameter extruded clear plastic, ribbed for positive grip and detachable without tools.
- H. Mounting Hardware: Manufacturer's standard as required for the type of installation shown.
- I. Hold-Down Brackets: Provide metal hold down brackets where blinds are to be mounted on doors.

2.3 FINISHES

- A. Aluminum: Manufacturer's standard baked-on finish in colors selected by Architect from manufacturer's available contract colors utilizing "Dust Shield" finish to inhibit dust build-up for easier maintenance.
- B. Cord and braided ladders shall be color coordinated with slat.

HORIZONTAL LOUVER BLINDS
SECTION 12 2113
3595001

2.4 FABRICATION

- A. Blind measurements shall be accurate to within plus or minus 1/8 inch or as recommended in writing by the manufacturer for the specific installation conditions.
- B. Hardware shall be enclosed in a metal head. Operating hardware shall be machine clinched to head to assure perfect alignment. Slats shall tilt to any angle by turning a transparent wand. Blinds shall fit within the window openings as detailed, unless otherwise indicated.
- C. Other materials and components not specifically described, but required for a complete and proper installation of horizontal window blinds, shall be selected by the Installer, subject to approval of the Architect. Do not intermix component parts of various manufacturers in assembled units.
- D. Prior to fabrication, verify cords and tilt devices will be accessible and operational from the floor and will not conflict with cabinets, doors, fixtures or other items. Locate on either end as directed or approved. Bring potential conflicts to Architect's attention for resolution prior to start of Work.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Prior to installation, carefully inspect and verify that the installed Work of other trades is complete to the point where this installation may properly commence.
- B. Verify that specified items may be installed in accordance with approved design.
- C. In the event of discrepancy, immediately notify the Architect. Do not proceed in discrepant areas until discrepancies have been fully resolved.

3.2 INSTALLATION

- A. Install horizontal window blinds level and true, in accordance with the Drawings and the manufacturer's recommended procedures.
- B. Blinds shall be installed inside mount, unless otherwise indicated. Consult with Architect where inside mount may not be possible.
- C. Provide 1-1/2 inch overlap at each jamb where face installations are indicated or approved.
- D. Divisions between blinds, where required, shall occur only at mullions.
- E. Install intermediate support brackets and extension brackets as needed to prevent deflection in headrail.

3.3 CLEANING AND ADJUSTING

- A. Test operation of horizontal window blind hardware before and after installation. Operation shall be smooth and uniform.
- B. Upon completion of installation, remove manufacturer's temporary labels, marks of identification. Thoroughly wash surfaces and remove foreign material. Leave entire Work in neat, orderly, clean and acceptable condition as approved. Replace damaged parts and surfaces which are not free from imperfections.
- C. Finish installation free of dirt and finger marks. Leave work area clean and free of debris.

3.4 PROTECTION

- A. Protect Work and materials of this Section prior to and during installation, and protect the installed Work and materials of other trades.
- B. In the event of damage, make repairs and replacements necessary to the approval of the Architect at no additional cost to the Owner.
- C. Exposed finishes shall be free from scratches, dents, permanent discolorations and other defects in workmanship or material.

END OF SECTION

*p:\sacramento\3595 tracy unified school district\001-000_villalovo es new shade structures\08 specifications\06 spec\04
final\bohn\12 2113_horizontal louver blinds.docx
Last Updated: April 2, 2021*

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Manufactured, plastic-laminate-faced, modular casework and accessory items.

1.2 RELATED REQUIREMENTS

- A. Section 01 6116, Volatile Organic Compound (VOC) Content Restrictions, for VOC limits pertaining to adhesives, sealants, fillers, primers, and coatings.
- B. Section 01 8113, Sustainable Design Requirements, for CAL-Green general
- ~~C. Section 06 4023, Interior Architectural Woodwork.~~
- ~~D. Section 09 2900, Gypsum Board.~~
- E. Section 09 9100, Painting.
- F. Section 12 3623, Plastic-Laminate-Clad Countertops.
- G. Division 26, Electrical, for electrical outlets and fittings built into architectural casework.

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as note on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CALGreen), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- C. American National Standards Institute (ANSI):
 - 1. ANSI A208.2: Medium Density Fiberboard for Interior Use.
 - 2. ANSI/BHMA A156.9: American National Standard for Cabinet Hardware; Builders Hardware Manufacturers Association.
 - 3. ANSI/BHMA A156.18: American National Standard for Materials and Finishes; Builders Hardware Manufacturers Association.
- D. National Electrical Manufacturers Association (NEMA):
 - 1. NEMA LD3.1: "High-Pressure Decorative Laminates."
- E. Woodwork Institute (WI)/ Architectural Woodwork Manufacturers of Canada (AWMAC):
 - 1. North American Architectural Woodwork Standards (NAAWS).

MANUFACTURED PLASTIC-LAMINATE-CLAD CASEWORK
SECTION 12 3216
3595001

1.4 DEFINITIONS

- A. General: The following definitions are in conformance with those included in the referenced NAAWS document.
- B. "Exposed Exterior" surfaces include all surfaces visible when doors and drawers are closed.
 - 1. Bottoms of casework more than 4 feet above the floor will be considered an exposed surface.
 - 2. Tops of casework that are visible by building occupants from stairs, mezzanines or other elevated locations will be considered as exposed.
- C. "Exposed Interior Surfaces" surfaces exposed to view in open casework or behind glass doors.
- D. "Semi-Exposed Surfaces" are interior surfaces only exposed to view when doors or drawers are open.
- E. "Concealed Surfaces" include surfaces of sleepers, web frames, dust panels, and other surfaces that are not visible after installation.

1.5 ADMINISTRATIVE REQUIREMENTS

- A. Submittal Procedures:
 - 1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
 - 2. Sustainable Design Submittals shall comply with the additional requirement of Section 01 8113, Sustainable Design Requirements.
 - 3. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
- B. Scheduling and Coordination:
 - 1. Require casework fabricator to examine the schedule and check it for timing, accuracy and compatibility with its work and shall coordinate work with the master schedule and job superintendent.
 - 2. Require casework fabricator to furnish assistance in coordination and scheduling of other work pertinent to casework installation and to notify Contractor of requirements so as to result in a well-coordinated job.

1.6 ACTION SUBMITTALS

- A. Shop Drawings:
 - 1. Submit dimensioned plans, elevations, component profiles, and details for each casework layout showing the following:
 - a. Locations and type of service fixtures with lines thereto; anchorage locations, installation details to floors and walls.

MANUFACTURED PLASTIC-LAMINATE-CLAD CASEWORK
SECTION 12 3216
3595001

- b. Relationship of units in to surrounding and adjacent construction including walls, doors, and windows.
 - c. Swing of doors.
 - d. Shelving.
 - e. Accessory items such as fillers, end panels, and valance.
 - f. Base height.
 - 2. First page of shop drawings and each elevation shall bear an individually serial-numbered WI "Certified Compliance Label."
- B. Product Data:
- 1. Provide manufacturers cut sheets for all materials proposed for use including:
 - a. Panel products.
 - b. Cabinet hardware items.
 - c. Laminates.
 - 2. Include manufacturer's literature for items which are proposed for use and specified herein only by listing the intended performance requirements.
- C. Samples: The following samples are required.
- 1. Each type of high pressure laminate (HPL), edge banding, cabinet liner, and melamine-faced panel.
 - a. Plastic laminate and edge banding to be selected from manufacturers' full range of colors by Architect.
 - 2. Hardware: Adjustable shelf clip, hinge, pull, magnetic catch, elbow catch and lockset. Returned hardware samples may be used on the project unless otherwise noted by the Architect.

1.7 INFORMATIONAL SUBMITTALS

- A. Before delivery of casework to jobsite, submit a WI "Certified Compliance Certificate" listing the items certified, the applicable NAAWS Grade, and whether installation is included.
- B. Qualification Data: For installer.
- C. Sample of manufacturers' warranty.
- D. Sustainable Design:
 - 1. General:
 - a. Submit information necessary to establish and document compliance with the California Green Building Standards Code.
 - b. Sustainable design submittals are in addition to other submittals.
 - 2. The following information shall be provided:
 - a. Composite Wood: Evidence of compliance that products meet formaldehyde limits of current CARB Airborne Toxic Control Measure (ATCM) as specified in Section 01 6116.

MANUFACTURED PLASTIC-LAMINATE-CLAD CASEWORK
SECTION 12 3216
3595001

- b. Adhesives and Sealants: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.

1.8 CLOSEOUT SUBMITTALS

- A. Warranty: Submit executed warranty.
- B. **[Specified maintenance materials]**

1.9 MAINTENANCE MATERIAL SUBMITTALS

- A. Provide additional materials as follows:
 - 1. Hinges: 10 each.
 - 2. Pulls: 10 each.
 - 3. Cabinet Locks: 10 each.
 - 4. Adjustable Shelf Supports: 25 each.
- B. Deliver to Owner as directed.

1.10 QUALITY ASSURANCE

- A. General:
 - 1. Furnish all components and accessories and all allied products new and free from defects.
 - 2. To assure proper coordination and eliminate divided responsibility, all work specified in this Section shall be executed under the direction of a single manufacturer and supplier.
- B. Qualifications:
 - 1. Manufacturer: The casework manufacturer must have not less than 5 years of production experience similar to this project, and the specified product, and whose qualifications indicate the ability to comply with the requirements of this section.
 - 2. Installer: The installer must have at least one project in the past 5 years with similar systems and complexities to those required for this project, and where the value of the woodwork is a minimum of 80% of the cost of woodwork for this project.
- C. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.
- D. Single-Source Responsibility: Use materials and products of one manufacturer whenever possible.
- E. Materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.
- F. Casework Designations:

MANUFACTURED PLASTIC-LAMINATE-CLAD CASEWORK
SECTION 12 3216
3595001

1. Reference numbers on Drawings are related to NAAWS Cabinet Design Series (CDS) Elevation numbers, and are used to identify prefinished casework and to indicate dimensions, general design, equipment, shelving (adjustable and fixed) and other components to be furnished. Unless modified by notation on Drawings, description for indicated number shall constitute requirements for such cabinets incorporating all features set forth in the NAAWS CDS Elevations.
 2. Use of the NAAWS CDS Elevations numbers, and specific requirements set forth on the Drawings and as specified, are not intended to preclude use of other manufacturer's product or procedure, which may be equal thereto, but are given to establish standard of design and quality of materials, construction and workmanship.
- G. Proof of compliance with the specified NAAWS Grade assembly and installation shall be provided by the following WI Quality Control Program:
1. WI Monitored Compliance Program.
 - a. All casework and the installation thereof for this project shall be directly monitored for compliance to the Contract by the Woodwork Institute under the scope of their Monitored Compliance Program (MCP).
 - 1) Inspections are to be performed at the beginning of fabrication, at the time of delivery to the job, at the beginning of installation, at completion of installation.
 - 2) Further information on the WI Monitored Compliance Program's Policies and Procedures are available directly from the Woodwork Institute, 916-372-9943.
 - 3) The WI MCP Registration Number shall be referenced in all communication.
 - b. Fees charged by the Woodwork Institute for their monitored compliance service are the responsibility of the Contractor and shall be included in the Contract sum.
 - c. Casework and/or installation determined to be non-compliant by WI and not corrected will be rejected.
 - d. Issuance of the WI Monitored Compliance Certificate is a prerequisite of the Owner's final acceptance.
- H. Mockups: Provide mockup of one base cabinet and one wall hung cabinet to verify finish material selections, modifications made under sample submittals, and to demonstrate aesthetic effects and set quality standards for materials and execution for cabinet exteriors, interior construction, and hardware.
1. The base cabinet is to have at least one drawer and be of the same material to be provided for the project.
 2. The approved mockup may be incorporated in the project.
- 1.11 DELIVERY, STORAGE AND HANDLING**
- A. Deliver undamaged products to job in manufacturer's sealed containers and/or original bundles with tags and labels intact.

MANUFACTURED PLASTIC-LAMINATE-CLAD CASEWORK

SECTION 12 3216

3595001

- B. Store materials in protected, dry conditions off of ground and in areas so as to not interfere with the progress of the work.
- C. Transport, store and handle in strict accordance with the manufacturer's recommendations.
- D. Do not deliver until wet operations in building are completed and storage area is closed in and broom clean, with relative humidity 50 percent or less at 70 degrees F.
- E. Deliver in sections to fit through openings.

1.12 FIELD CONDITIONS

- A. Environmental Limitations: Do not deliver or install casework until building is enclosed, wet-work is complete, and HVAC system is operating and maintaining temperature and relative humidity at levels planned for building occupants during the remainder of the construction period.
- B. Products shall be available at project when required for installation so as not to delay job progress. Installer for these products shall cooperate with installers performing work under other sections involved to effect proper installation.
- C. Casework fabricator shall coordinate installation of any Owner supplied equipment where indicated on the Drawings.
- D. Field Measurements: Make and be responsible for all field dimensions necessary for proper fitting and completion of work. Report discrepancies to Architect before proceeding.

1.13 WARRANTY

- A. Manufacturer: In addition to the Contractor's Standard Guarantee, furnish Owner with manufacturer's fully executed written 5-year warranty for casework against defects in materials and workmanship. Warranty shall include against delaminations, joint separations, warp or twist in doors more than 1/4 inch, and splits or cracks in finished surfaces.

PART 2 - PRODUCTS

2.1 DESIGN AND PERFORMANCE CRITERIA

- A. Sustainable Design:
 - 1. Composite wood products must meet current formaldehyde emission limits of CARB Airborne Toxic Control Measure (ATCM) as specified in Section 01 6116.
 - 2. VOC emissions for field-applied adhesives, sealants, and sealant primers must comply with limits specified in Section 01 6116.

2.2 PANEL MATERIALS

- A. Medium-Density Fiberboard (MDF): ANSI A208.2, Grade 155, formaldehyde-free, and meeting grade MR30 moisture resistance; "Medite II," by Roseburg, or equal.
 - 1. Thickness: 3/4 inch, unless otherwise shown or specified.
- B. Thermally-Fused Melamine Panels (TFM): Melamine resin-impregnated decorative paper thermally fused to a formaldehyde free MDF core.
 - 1. Color: White, unless otherwise noted or selected by Architect from a minimum of 6 colors.
- C. Plywood: Exterior type, Grade B-C or better. Plywood to be free of urea-formaldehyde.
- D. Hardboard: Tempered Grade, conforming to standards of American Hardboard Association or PS-50; use smooth side exposed.
- E. Particle Board: Not permitted.

2.3 LAMINATE MATERIALS

- A. High-Pressure Plastic Laminate: Conforming to NEMA LD3.1 and ISO 4586-2.
 - 1. Grades:
 - a. Horizontal Surfaces: ISO 10/HGS; horizontal, general purpose, standard.
 - b. Vertical Surfaces: ISO 20/VG; vertical, general purpose.
 - c. Cabinet Liner (If Specified TFM Panel is Not Used): ISO 72/CLS, cabinet liner, standard.
 - d. Backing Sheet: ISO 91/BKL; backer, light duty.
 - 2. Manufacturers: Formica, Wilsonart, Arborite, Pionite, Nevamar, or equal.
 - 3. Colors, and Patterns:
 - a. Exposed: As selected by Architect from manufacturer/suppliers' full product color range.
 - 1) There will be no additional cost allowance for premium color selections, or for selection of different colors for different rooms up to a maximum 6 colors.
 - 2) Doors and frames may be different selections.
 - b. Cabinet Liner: White.

2.4 ADDITIONAL MATERIALS

- A. Edge Bandings:
 - 1. 3-mm thick PVC: Solid, high impact, purified, color-thru, acid resistant, pre-laminated primed edging, machine-applied with hot melt adhesives, automatically trimmed, inside/outside length-radiused for uniform appearance, buffed and corner-radiused for consistent design.
 - a. Locations: Door and drawer face edge, and exposed shelf edge.

MANUFACTURED PLASTIC-LAMINATE-CLAD CASEWORK
SECTION 12 3216
3595001

- b. Color: As selected by Architect from manufacturer's full range of standard colors.
- 2. 0.02-inch thick PVC: Flat Edge, solid, high impact, purified, color-thru, acid resistant PVC, edging machine-applied with hot melt adhesives, automatically trimmed face, back and corners for uniform appearance.
 - a. Locations:
 - 1) Drawer body edge, not drawer face, and cabinet body edge including door and drawer front spacer rail.
 - 2) Interior body component edging, interior dividers and interior shelving.
 - b. Color: Match cabinet interior surface color.

2.5 HARDWARE

- A. Comply with requirements of BHMA A156.9, Type 2 (Institutional).
- B. Finishes:
 - 1. Exposed Items: Satin chromium plated, 626, unless otherwise noted complying with ANSI/BHMA A156.18.
 - 2. Concealed Items: Manufacturer's standard finish, complying with applicable product class of ANSI/BHMA A156.9.
- C. Hinges:
 - 1. Type: Heavy duty, five knuckle, 2-3/4-inch, institutional type hinge; let into door to achieve 1/8 inch reveals; Part Number 374 by Rockford Process Control, or equal, unless otherwise recommended by fabricator for total door and side panel thickness after application of laminate finish.
 - a. Hinges shall be mill ground, hospital tip, tight pin feature with all edges eased.
 - b. Hinges to be full wrap around type of tempered steel 0.095 inch thick.
 - c. Hinges shall accommodate 3/4 inch thick laminated door and allow 270 degree swing.
 - 2. Fasteners: Each hinge to have minimum 9 screws, #7, 5/8 inch FHMS to assure positive door attachment. Fill all holes if greater than 9.
 - 3. Quantity:
 - a. One pair per door to 48 inches in height.
 - b. One and one-half pair 48 inches in height to 84 inches in height.
 - c. Over 84 inches in height, provide 2 pair of hinges.
- D. Door and Drawer Pulls: Hafele, Catalog No. 110.08.400, or equal.
- E. Magnetic Catches: Häfele 246 with matching strike plate, matt nickel finish, or equal.
- F. Locks: CompX National Lock C8100 Series pin tumbler, or equal.
 - 1. All cabinets in each Room to be keyed alike.
 - 2. All Rooms to be keyed different.

MANUFACTURED PLASTIC-LAMINATE-CLAD CASEWORK
SECTION 12 3216
3595001

- 3. Locations: As indicated on the Drawings.
- G. Locks: Schlage CL2000 Series cabinet and drawer locks with solid brass 6 pin cylinders.
 - 1. Locks in rooms keyed alike; rooms keyed differently.
- H. Surface Bolt for Locked Pair Doors: Elbow Catch: #2 Elbow Catch by Ives, or equal.
 - 1. Finish: Satin chrome.
 - 2. Locate and mount surface bolt on door far enough below shelf to allow for 1/2-inch deflection of shelf and also to allow for proper engagement of surface bolt and angle strike.
- I. Drawer Guides: Accuride as specified, or equal:
 - 1. Drawers Less Than 24 inches Wide: Light duty, full extension; Model 3732.
 - a. Provide appropriate length.
 - b. Load Rating per Pair: 100-pounds.
 - 2. Drawers 24 inches to 36 Inches Wide: Medium duty with 1-inch over travel; Model 3301.
 - a. Provide appropriate length.
 - b. Load Rating per Pair: 150-pounds.
 - 3. Drawers 36-inches to 42-inches Wide: Heavy-duty with 1-inch over travel; Model 3634.
 - a. Provide appropriate length.
 - b. Load Rating per Pair: 200-pounds.
 - 4. Drawers 42-inches to 48-inches Wide: Heavy duty with 1-inch over travel; Model SS5321.
 - a. Provide appropriate length.
 - b. Load Rating per Pair: 350-pounds.
- J. Adjustable Shelf Supports: Seismic restraining type; "Universal 1" by Hettich International for insertion into 5 mm holes, or equal.

2.6 ADDITIONAL MATERIALS

- A. Bumper Pads (Silencers): Hemispherical, quiet clear type, 55 Shore A hardness; 3M Bumpon Protective Products, or equal.
- B. Adhesive: As recommended by panel manufacturer best suited for the intended use and that has a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
- C. Glue: Aliphatic-resin, polyurethane, or resorcinol wood glue recommended by manufacturer for general carpentry use that has a VOC content of 30 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
- D. Fasteners: Size and type to suit application in accordance with specified standards and as required.

MANUFACTURED PLASTIC-LAMINATE-CLAD CASEWORK
SECTION 12 3216
3595001

2.7 FABRICATION - GENERAL

- A. Construction shall conform to NAAWS casework requirements.
- B. Make job measurements as required for proper fabrication of the work.
- C. Grade: Custom. If provisions for the NAAWS Grade are in conflict with, or modified by the drawings and/or specifications, the modifications shall govern.
- D. Door and Drawer Front Style: Flush overlay, NAAWS Style A.
- E. Carcass Construction: Type A frameless. Provide as single unit at open shelving to greatest extent possible.

2.8 FABRICATION OF CABINET COMPONENTS

- A. Cabinet Bodies:
 - 1. Fabricate, assemble and finish each cabinet as complete, self-supporting unit.
 - a. Unless otherwise shown, counter height and tall storage units shall be 24 inches minimum overall depth; wall-hung units shall be 15 inches minimum overall depth.
 - b. At concealed locations, provide tops on all wall-hung and tall cabinets utilizing melamine on both faces.
 - c. At locations where the tops of wall hung or tall cabinets are visible, provide tops on all wall-hung and tall cabinets utilizing HPL on exterior face and melamine on interior face.
 - d. Fabricate bottoms, tops and frames of lock-joint glued and screwed, or dowelled and glued construction to end panel construction. Simple butted not permitted.
 - e. Tops and sides of tall units and wall-hung cabinets shall be 3/4-inch thick MDF core.
 - f. Bottoms of upper cabinets shall be constructed of same materials as specified for shelving.
 - g. Tall cabinets and base cabinets, fronts and sides shall be 3/4-inch thick MDF core.
 - h. Cabinet backs shall be a minimum of 1/4-inch thick.
 - i. Dowel and screw partitions and boxed shelves into top framing, bottoms or ends, as applicable.
 - j. Middle shelf of tall cabinets, 5 feet or greater in height, shall be fixed.
 - k. At top of counter height units, provide 3/4-inch plywood boxed subframe, mortised and tenonned, glued and screwed, for concealed attachment of countertop and for cabinet rigidity.
 - l. Provide toe space on floor-mounted units.
 - m. For tall units and wall-mounted cabinets, include 5/8 inch x 3 inch concealed wood strips full length at top and bottom, for screw or bolt anchorage to wall to conform to pull requirements of Title 24.
 - n. Holes for Shelf Support Clips: 32mm on center.

MANUFACTURED PLASTIC-LAMINATE-CLAD CASEWORK
SECTION 12 3216
3595001

- 1) Provide 2 holes on each side of shelf except provide a 3rd hole where cabinets are deeper than 24 inches.
 - 2) Locations shall be confirmed with Architect.
 - o. The fabrication of casework must allow for shim space at the base of the cabinets, to account for field conditions, as required so that the height from finish floor to top of counter, and sink rim where occurs, does not exceed the specified height at any location along the countertop after installation.
 - 2. Finishing:
 - a. Exposed Interior Surfaces and Semi-Exposed Surfaces:
 - 1) Melamine bonded to MDF core; specified TFM panel.
 - 2) Use for all semi-exposed surfaces, tops and bottoms of wall-hung and tall cabinets except as otherwise specified, concealed ends, partitions, and drawer boxes.
 - 3) See "Shelves" Paragraph for panel and finish requirements for shelving.
- B. Drawers:
- 1. Fabrication:
 - a. Fabricate and assemble drawer boxes with subfront and back glued and screwed into tenons at drawer sides.
 - b. Fronts shall be 3/4 inch thick MDF.
 - c. Sides: 1/2 inch thick MDF to create drawer box subfront, sides, back and bottom.
 - d. Extend bottom into dados with glue and screws at all 4 edges, using 1/4-inch materials matching the sides and backs.
 - e. At drawers over 30 inches wide, provide 1/2-inch bottoms.
 - f. Install 2-drawer guides for each drawer with positive closing and stop device to prevent inadvertent removal.
 - g. Drawer boxes to be full height of drawer opening.
 - h. Attach drawer front to subfront with #8 x 1-inch pan head wood screws (P.H.W.S.)
 - i. Provide closing stops at the rear of both drawer sides, unless stops are built into the slides to prevent the drawer front from impacting the cabinet body.
 - 2. Finishing:
 - a. Drawer Front: Vertical grade high-pressure laminate (HPL).
 - b. Interior Face of Drawer Front: Cabinet liner.
 - c. Band all 4 edges of drawer front with specified banding material.
 - d. Provide TFM panel with melamine finish on both faces, for subfront, sides, back and bottom.
- C. Doors:
- 1. Fabrication:
 - a. Panel: 3/4-inch thick MDF.

MANUFACTURED PLASTIC-LAMINATE-CLAD CASEWORK
SECTION 12 3216
3595001

- b. Hang face-mounted over cabinet, pairs parallel with proper clearance at pull edges. Install hardware.
 - c. Clearance Tolerances: Develop 1/8 inch maximum reveals.
 - 2. Finishing:
 - a. Exposed Exterior Face: Specified HPL.
 - 1) Where wood grain pattern is selected, provide pairs of doors with book-match wood grain patterns.
 - b. Exposed Interior Face: Cabinet liner.
 - c. Band all 4 edges of doors with specified banding material.
- D. Shelves:
 - 1. Fabrication - General:
 - a. Shelving to be adjustable on 1-1/4 inch centers supported by 4 adjustable shelf clips.
 - b. Loading capacity to be minimum 50 pounds per square foot, not to exceed 200 pounds on any shelf.
 - c. Shelving shall match the interior depth of the cabinet box.
 - d. Band all leading edges with edge banding material as specified.
 - 2. Shelving less than 24 inches: 3/4-inch MDF.
 - a. Finish: Melamine, both sides.
 - 3. Shelving 24 to 30 inches: 1-inch MDF.
 - a. Finish: Melamine, both sides.
 - 4. Shelving Greater than 30 inches, up to 36 inches: 1-inch, MDF.
 - a. Finish: Vertical grade HPL, both sides, applied with rigid glue line process.
 - 5. Shelving Greater than 36 inches, up to 48 inches: 1-inch plywood.
 - a. Finish: Vertical grade HPL, both sides, applied with rigid glue line process. Contact adhesive is not permitted.
- E. Scribes and Filler Panels:
 - 1. Provide matching scribes and filler panels, and scribe all cabinets to abutting walls, partitions and ceilings.
 - 2. Scribes shall not exceed 1-1/2 inches wide.
 - 3. Scribe to be covered top and bottom.
 - 4. At locations where casework wraps inside corners, provide top and bottom filler panels where voids occur.
- F. Cabinet Bases:
 - 1. If casework manufacturer chooses to use cabinet bases, they shall be 4 inches standard height.
 - 2. Fabricate completely out of 3/4-inch plywood in continuous lengths to insure straight and level installation of cabinet bodies. MDF is not acceptable for use at bases.

3. Freestanding cabinets shall have cabinet ends running directly to the floor.
4. Anchorage fasteners to be neatly installed through the back and anchor strip at the top and bottom, and middle at tall cabinets.

2.9 COORDINATION WITH APPLIANCES

- A. Contractor shall have casework manufacturer review all locations where appliances are to be installed and coordinate dimensions to ensure the correct size openings are provided.
 1. Shop drawings shall clearly indicate locations and opening dimensions.
 2. Where appliances are not in contract, shop drawings shall request confirmation of critical dimensions.
- B. Adjustments that need to be made to the casework due to appliances not fitting correctly are to be done at no additional cost to the Project.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Prior to installing casework, examine and verify that the installed work of all other trades is complete to the point where this work may properly commence.
- B. Verify that specified items may be installed in accordance with the approved design.
- C. Review in job conditions, installation requirements, and quality of completed substrate for compliance with Architect's expectations related to floor flatness for installation of casework.
- D. In the event of discrepancy, immediately notify the Architect. Do not proceed in discrepant areas until discrepancies have been fully resolved.

3.2 PREPARATION

- A. Take all necessary measurements in the field to ensure proper dimensions for cabinets prior to fabrication.
- B. Coordinate with other trades whose work adjoins, combines, or aligns with casework.
- C. Where substrate is not in compliance with Architect's expectations related to floor flatness for installation of casework, and where excessive shimming to meet these expectations would be required, level substrate using latex-modified, portland cement based or blended hydraulic-cement-based formulation as specified in Section 03 5416, Hydraulic Cement Underlayment.

3.3 INSTALLATION

- A. Install all work in conformance with the referenced NAAWS document.

MANUFACTURED PLASTIC-LAMINATE-CLAD CASEWORK
SECTION 12 3216
3595001

- B. Supervision: Installation work shall be under direct supervision of representative of manufacturer of the casework.
- C. Set work level, square and in true alignment. Cabinetwork shall fit to walls and upon completion of installation shall show no marks, indentations or other defects. Furnish scribes, filler panels, trim and molding required for finished installation. When set, each individual cabinet shall be capable of withstanding, without movement, a force of 200 pounds applied in any direction.
- D. Cabinet work shall be installed as required so that the height from finish floor to top of counter, and sink rim where occurs, does not exceed the specified height at any location along the countertop after installation.
- E. Method of attachment, including the type, size, frequency and/or spacing of anchoring devices and fasteners shall comply to NAAWS minimum requirements or be as indicated on the Drawings or as specified, whichever is more restrictive.
- F. Doors, drawers and fixtures shall operate correctly and smoothly.
- G. Furnish miscellaneous metal support and bracing required for installation. If necessary, deliver these items to other trades responsible for installation into adjacent work and designate exact location for their installation.
- H. Provide specified seismic restraining, adjustable shelf supports at all adjustable shelves to prevent shelf from sliding out of cabinets with or without doors.

3.4 ADJUSTING AND CLEANING

- A. Prior to final inspection and acceptance by the Architect, completely check each installed item and adjust for proper operation.
- B. Remove all fingerprints, smudges and the like from casework; vacuum clean drawers and interiors of dust, dirt and sawdust.

3.5 PROTECTION

- A. Protect work and materials of this Section prior to and during installation and protect the installed work and materials of other trades. Adjust all moving or operating parts to function smoothly and correctly.
- B. In the event of damage, make all repairs and replacements necessary to the approval of the Architect at no additional cost to the Owner.

END OF SECTION

p:\sacramento\3595 tracy unified school district\001-000_villalovoz es new shade structures\08 specifications\06 spec\04 final\bohn\12 3216_manufactured plastic-laminate-clad casework.docx
Last Updated: November 1, 2021

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Plastic laminate faced counters and splashes.

1.2 RELATED REQUIREMENTS

- A. Section 01 6116, Volatile Organic Compound (VOC) Restrictions, for VOC limits pertaining to adhesives, sealants, fillers, primers, and coatings.
- B. Section 01 8113, Sustainable Design Requirements, for CAL-Green general requirements and procedures.
- ~~C. Section 06 4023, Interior Architectural Woodwork.~~
- D. Section 07 9200, Joint Sealants.
- E. Section 12 3216, Manufactured Plastic-Laminate-Clad Casework; casework to receive countertops.
- F. Division 26, Electrical, for electrical outlets and fittings built into countertops.

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CAL Green), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- C. American National Standards Institute (ANSI):
 - 1. A161.2: Decorative Laminate Countertops, Performance Standards for Fabricated High Pressure.
 - 2. A208.1: Particleboard.
 - 3. A208.2: Medium Density Fiberboard (MDF) for Interior Applications.
- D. International Organization for Standardization (ISO):
 - 1. 4586-2: "High-pressure decorative laminates (HPL, HPDL) - Sheets based on thermosetting resins (usually called laminates) - Part 2: Determination of properties."
- E. Woodwork Institute (WI): North American Architectural Woodwork Standards (NAAWS) published jointly by WI and the Architectural Woodwork Manufacturers of Canada (AWMAC).

PLASTIC-LAMINATE-CLAD COUNTERTOPS
SECTION 12 3623
3595001

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Submittal Procedures:
 - 1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
 - 2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
 - 3. Sustainable Design Submittals shall comply with the additional requirement of Section 01 8113, Sustainable Design Requirements.

1.5 ACTION SUBMITTALS

- A. Shop Drawings: Prepare for each countertop in accordance with Section 1 Article entitled "Submittals" of the referenced NAAWS document.
 - 1. Show items interfacing with countertops including relationship to supporting casework.
 - 2. Identify materials to be used.
 - 3. Shop drawings for countertops may be submitted as part of shop drawings prepared and submitted under Section 12 3216, Manufactured Plastic-Laminate-Clad Casework.
- B. Samples: 8 by 10-inch piece of selected pattern and color of plastic laminate.

1.6 INFORMATIONAL SUBMITTALS

- A. Before delivery of countertops to jobsite, submit a WI "Certified Compliance Certificate" listing the items certified, the applicable NAAWS Grade, and whether installation is included.
- B. Sustainable Design:
 - 1. General:
 - a. Submit information necessary to establish and document compliance with the California Green Building Standards Code.
 - b. Sustainable design submittals are in addition to other submittals.
 - 2. The following information shall be provided:
 - a. Adhesives and Sealants: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.
 - b. Composite Wood: Evidence of compliance that products meet formaldehyde limits of current CARB Airborne Toxic Control Measure (ATCM) as specified in Section 01 6116.
- C. Qualification Data: For fabricator.

1.7 CLOSEOUT SUBMITTALS

- A. Guarantee: Submit extended Contractor guarantee.

1.8 MAINTENANCE MATERIAL SUBMITTALS

- A. Grommets: 5 of each Type.

1.9 QUALITY ASSURANCE

- A. Fabricator Qualifications: Active member of WI. Other fabricators will be considered for approval upon submission of at least 5 years of verifiable evidence of experience in successful completion of work similar to work of this Project. This provision does not waive compliance with specified WI certification.
- B. Standard for Materials and Workmanship:
 - 1. Comply with the applicable requirements of Section 11 - Countertops of the "North American Architectural Woodwork Standards (NAAWS)" published jointly by WI and AWMAC. (hereinafter referred to as "woodworking standard").
 - 2. Where Contract Documents indicate requirements that conflict with or augment the woodworking standard, comply with the conflicting or augmenting requirements.
- C. Materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.
- D. Proof of compliance with the specified NAAWS Grade assembly and installation shall be provided by the following WI Quality Control Program:
 - 1. WI Monitored Compliance Program.
 - a. All countertops and the installation thereof for this project shall be directly monitored for compliance to the Contract by the Woodwork Institute under the scope of their Monitored Compliance Program (MCP).
 - 1) Inspections are to be performed at the beginning of fabrication, at the time of delivery to the job, at the beginning of installation, at completion of installation.
 - 2) Further information on the WI Monitored Compliance Program's Policies and Procedures are available directly from the Woodwork Institute, 916-372-9943.
 - 3) The WI MCP Registration Number shall be referenced in all communication.
 - b. Fees charged by the Woodwork Institute for their monitored compliance service are the responsibility of the Contractor and shall be included in the Contract sum.
 - c. Countertops and/or installation determined to be non-compliant by WI and not corrected will be rejected.
 - d. Issuance of the WI Monitored Compliance Certificate is a prerequisite of the Owner's final acceptance.

PLASTIC-LAMINATE-CLAD COUNTERTOPS
SECTION 12 3623
3595001

1.10 DELIVERY, STORAGE, AND HANDLING

- A. Do not deliver products until wet work, painting, and similar operations in storage and installation areas that could damage or soil work have been completed.
- B. Protect products during transit, delivery, storage, and handling so as to prevent damage, soiling, and deterioration.
- C. Store countertops only in areas where ambient conditions required can be and are maintained.
- D. Coordinate delivery with fabrication and installation of casework.

1.11 FIELD CONDITIONS

- A. Products shall be available at project when required for installation so as not to delay job progress. Contractor shall have its installer for these products cooperate with installers performing work under other Sections involved to effect proper installation.
- B. Environmental Limitations: Do not deliver or install countertops until building is enclosed, wet-work is complete, and HVAC system is operating and maintaining temperature and relative humidity at levels planned for building occupants during the remainder of the construction period.
- C. Field Measurements: Where countertops are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication and indicate measurements on shop drawings.

1.12 GUARANTEE

- A. Contractor: In addition to its standard Guarantee under the Contract, furnish Owner a special extended written 5-year guarantee, cosigned by installer, agreeing to repair or replace plastic-laminate-clad countertops that fail to perform as required within guarantee period as a result of failure of materials or installation workmanship at no additional cost to the Owner.

PART 2 - PRODUCTS

2.1 DESIGN AND PERFORMANCE CRITERIA

- A. Sustainable Design:
 - 1. VOC emissions for field-applied adhesives, sealants, and sealant primers must comply with limits specified in Section 01 6116.
 - 2. Composite wood products must meet current formaldehyde emission limits of CARB Airborne Toxic Control Measure (ATCM) as specified in Section 01 6116.

2.2 PANEL MATERIALS

- A. Medium-Density Fiberboard (MDF): ANSI A208.2, Grade 155, formaldehyde free. 3/4 inch thick unless otherwise indicated.

1. Typical Locations: Meeting grade MR30 moisture resistance; "Medite II," by Roseburg, or equal.
 2. At Sinks and Adjoining Countertops on Same Wall: Meeting grade MR50 moisture resistance; "Medex," by Roseburg, or equal.
- B. Particleboard: Not permitted.

2.3 LAMINATE MATERIALS

- A. High-Pressure Plastic Laminate: Conforming to ISO 4586-2.
- B. Grades:
1. Horizontal Surfaces and Backsplash: ISO 10/HGS; horizontal, general purpose.
 2. Postforming: ISO 12/HGP; horizontal, general purpose, postformable.
 3. Backing Sheet: ISO 91/BKL; backer, light duty.
- C. Manufacturers: Formica, Wilsonart, Arborite, Pionite, Nevamar, or equal.
- D. Colors, and Patterns: As selected by Architect from manufacturer/suppliers' full product color range.
1. There will be no additional cost allowance for premium color selections, or for selection of different colors for different rooms up to a maximum 6 colors.

2.4 ACCESSORIES

- A. Edge Treatment: Same as laminate cladding on horizontal surfaces.
- B. Grommets: Doug Mockett & Co. Inc., Manhattan Beach, CA, 310-318-2491, or equal.
1. Type: SG Series, or EDP Series; coordinate data connection requirements with Owner.
 2. Material and Color: As selected by Architect.
- C. Countertop Braces: A&M Brace as manufactured by A & M Hardware, Inc. or equal.
1. Size brace appropriate with size of countertop.
 2. Provide Häfele "Hebgo" (1100 lb. capacity) bracket, or equal at locations where continuous raceway runs directly below countertop brace.
 3. Provide largest brace available for given countertop depth to achieve maximum countertop support.
 4. Color: As selected by Architect from full range of manufacturer's standard colors. Multiple colors may be selected.
- D. Fasteners: Type and size as required.
- E. Adhesives: VOC compliant and passing NAAWS "Heat Resistance Test.". Do not use adhesives that contain urea formaldehyde.

PLASTIC-LAMINATE-CLAD COUNTERTOPS
SECTION 12 3623
3595001

2.5 FABRICATION

- A. General:
 - 1. Obtain field measurements, and verify dimensions before fabricating work.
 - 2. Comply with NAAWS Custom Grade requirements and ANSI A161.2.
- B. Core Material: Specified MDF.
- C. Fabricate to dimensions, profiles, and details shown.
- D. Build up countertop thickness to 1-1/2 inches at front, back, and ends with additional layers of core material laminated to top.
- E. Provide specified backing sheet at configurations and installation conditions recommended in the woodworking standard.
- F. All other Countertops: Provide roll-form 180-degree edge.
- G. Unless otherwise shown, round projecting or outside corners with 3/4-inch minimum radius or clip 45-degree angle corner.
- H. Provide joints only where maximum available lengths or countertop configuration requires a joint and where interfacing with existing. Where joints are required, balance and center. Make joints neat, flush and watertight.
- I. To greatest extent possible, complete fabrication and assembly before shipment to site.
 - 1. Disassemble components only as necessary for shipment and installation.
 - 2. Where necessary for fitting at site, provide extra borders and edges so as to allow scribing and trimming to fit.
- J. Precut openings for applied fixtures and fitting, where possible. Field cuts shall be performed by the fabricator.
- K. Conceal all fasteners.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Verify that backing has been installed at appropriate locations for anchorage.
- B. Examine shop-fabricated work for completion. Complete work as required.

3.2 INSTALLATION

- A. Install countertops in accordance with Section 11 of the NAAWS and requirements shown on the Drawings.

PLASTIC-LAMINATE-CLAD COUNTERTOPS
SECTION 12 3623
3595001

- B. Install countertops and backsplashes with concealed fastenings, securely attaching to cabinet bases or countertop braces / brackets at 36 inches on center maximum. Scribe neatly to walls or other adjoining surfaces.
- C. Make joints neatly, with uniform appearance.
- D. Install work plumb, level, true, and straight, with no distortions. Install with no variation in flushness of adjoining surfaces.
- E. Countertops shall be installed as required so that the height from finish floor to top of counter, and sink rim where occurs, does not exceed the specified height at any location along the countertop after installation.
- F. Shim as required, using concealed shims.
- G. Sealant: Install sealant as specified in Section 07 9200, Joint Sealants, to close small unavoidable gaps between counter and abutting surfaces, and at sinks. Sealant shall not be a substitute for tightly scribed work.
- H. Install, at no additional charge, extra stock grommets where directed by Owner following completion of countertop installation.

END OF SECTION

p:\sacramento\3595 tracy unified school district\001-000_villalovoz es new shade structures\08 specifications\06 spec\04 final\bohn\12 3623_plastic-laminate-clad countertopscx.docx
Last Updated: November 12, 2021

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes
 - 1. This section describes the basic requirements for the electrical work on this project.

1.2 REFERENCES

- A. National Electrical Contractors Association (NECA): Standard of Installation
- B. National Fire Protection Association (NFPA): 70E
- C. National Safety Council (NSC)
- D. Occupational Safety and Health Administration (OSHA)

1.3 SUBMITTALS

- A. Product Data
- B. Operation and Maintenance (O&M) Manuals
- C. Field Test Reports

1.4 QUALITY ASSURANCE

- A. Reference to Codes, Standards, Specifications and recommendations of technical societies, trade organizations and governmental agencies shall mean that latest edition of such publications adopted and published prior to submittal of the bid. Such codes or standards shall be considered a part of this Specification as though fully repeated herein.
- B. When codes, standards, regulations, etc. allow Work of lesser quality or extent than is specified under this Division, nothing in said codes shall be construed or inferred authority for reducing the quality, requirements, or extent of the Contract Documents. The Contract Documents address the minimum requirements for construction.
- C. Work shall be performed in accordance with all applicable requirements of the edition indicated on the drawings of all governing codes, rules and regulations including but not limited to the following minimum standards, whether statutory or not:
 - 1. California Electric Code (CEC)
 - 2. California Building Code (CBC)
 - 3. California Green Building Code (CGC)
 - 4. California Fire Code (CFC)

ELECTRICAL BASIC REQUIREMENTS

SECTION 26 0100

3595001000

5. California Energy Code (CENC)
 6. California Mechanical Code (CMC)
 7. California Plumbing Code (CPC)
- D. Standards: Equipment and materials specified under this Division shall conform to the following standards where applicable:
1. ACI American Concrete Institute
 2. ANSI American National Standards Institute
 3. ASTM American Society for Testing Materials
 4. CBM Certified Ballast Manufacturers
 5. ETL Electrical Testing Laboratories
 6. FS Federal Specification
 7. IEEE Institute of Electrical and Electronics Engineers, Inc.
 8. IPCEA Insulated Power Cable Engineer Association
 9. NEMA National Electrical Manufacturer's Association
 10. UL Underwriters' Laboratories
- E. Independent Testing Agency qualifications:
1. Testing Agency shall be an independent testing organization that will function as an unbiased authority, professionally independent of Manufacturer, Supplier and Contractor, furnishing and installing equipment or system evaluated by Testing Agency.
 2. Testing Agency shall be regularly engaged in the testing of electrical equipment, devices, installations, and systems.
 3. Testing Agency shall meet Federal Occupational Safety and Health Administration (OSHA) requirements for accreditation of independent testing laboratories, Title 9, Part 1907.
 4. On-site technical personnel shall be currently certified by the International Electrical Testing Association in electrical power distribution system testing.
 5. Testing Agency shall use technicians who are regularly employed by the firm for testing services.
 6. Contractor shall submit proof of above Testing Agency qualifications with bid documentation upon request.
- F. All base material shall be ASTM and/or ANSI standards.
- G. All electrical apparatus furnished under this Section shall conform to NEMA standards and the NEC and bear the UL label where such label is applicable.
- H. Certify that each welder performing Work has satisfactorily passed AWS qualification tests for welding processes involved and, if pertinent, has undergone re-certification.

PART 2 - PRODUCTS

- A. SEE SCHEDULES ON ELECTRICAL PLANS and other Division 26 sections

PART 3 – EXECUTION

3.1 ROUGH-IN

- A. Contractor shall verify lines, levels and dimensions indicated on the construction document drawings and shall be responsible for the accuracy of the setting out of Work and for its strict conformance with existing conditions at the Project site.
- B. Verify final locations for rough-ins with field measurements and with the requirements for the actual equipment to be connected.
- C. Refer to equipment specifications in other sections for equipment rough-in requirements.

3.3 INSTALLATION

- A. Preparation, sequencing, handling, and installation shall be in accordance with Manufacturer's written instructions and technical data particular to the product specified and/or accepted equal except as otherwise specified.
- B. Comply with Shop Drawings prepared by Manufacturer.
- C. Verify all dimensions by field measurements.
- D. Arrange for chases, slots, and openings in other building components during progress of construction, to allow for electrical installations.
- E. Coordinate the installation of required supporting devices and sleeves to be set in poured-in-place concrete and other structural components, as they are constructed.
- F. Sequence, coordinate and integrate installations of electrical materials and equipment for efficient flow of the Work. Give particular attention to large equipment requiring positioning prior to closing in the building.
- G. Where mounting height is not detailed or dimensioned, contact the Architect for direction prior to proceeding with rough-in.
- H. Coordinate connection of electrical systems with exterior underground and overhead utilities and services. Comply with requirements of governing regulations, franchised service companies and controlling agencies. Provide required connection for each service.
- I. Install systems, materials, and equipment to conform with approved submittal data, including coordination drawings, to greatest extent possible. Conform to arrangements indicated by the construction documents, recognizing that portions of the Work are indicated only in diagrammatic form. Where coordination requirements conflict with individual system requirements, refer conflict to the Architect.

ELECTRICAL BASIC REQUIREMENTS

SECTION 26 0100

3595001000

- J. Install systems, materials, and equipment level and plumb, parallel and perpendicular to other building systems and components, where installed exposed in finished spaces.
- K. Install electrical equipment to facilitate servicing, maintenance and repair or replacement of equipment components. As much as practical, connect equipment for ease of disconnecting, with minimum of interference with other installations.
- L. Coordinate electrical systems, equipment, and materials installations with other building components.
- M. Provide access panel or doors where devices or equipment are concealed behind finished surfaces.
- N. Install systems, materials and equipment giving right-of-way priority to other systems that are required to maintain a specified slope.
- O. Conform to the National Electrical Contractors' Association "Standard of Installation" for general installation practice.

3.3 CUTTING, PATCHING, PAINTING, AND SEALING

- A. Structural members shall in no case be drilled, bored, or notched in such a manner that will impair their structural value. Cutting of holes, if required, shall be done with core drill and only with the approval of the Architect and Structural Engineer.
- B. Protection of Installed Work: During cutting and patching operations, protect adjacent installations.
- C. Application of joint sealers:
 - 1. General: Comply with joint sealer Manufacturers' printed application instructions applicable to products and applications indicated, except where more stringent requirements apply.
 - 2. Installation of fire-stopping sealant: Install sealant, including forming, packing and other accessory materials, to fill openings around electrical services penetrating floors and walls, to provide fire-stops and fire-resistance ratings indicated for floor or wall assembly in which penetration occurs. Comply with installation requirements established by testing and inspecting agency.

3.4 FIELD QUALITY CONTROL

- A. General testing requirements:
 - 1. The purpose of testing is to ensure that all tested electrical equipment, both Contractor and Owner supplied, is operational and within industry and Manufacturer's tolerances and is installed in accordance with design Specifications.

ELECTRICAL BASIC REQUIREMENTS
SECTION 26 0100
3595001000

2. Tests and inspections shall determine suitability for energization.
 3. Perform tests in presence of the Owner's Representative and furnish test equipment, facilities and technical personnel required to perform tests.
 4. Tests shall be conducted during the construction period and at completion to determine conformity with applicable codes and with these Specifications.
- B. Tests: In addition to specific system test described elsewhere, tests shall include:
1. Equipment operations: Test motors for correct operation and rotation.
 2. Lighting control circuits: Test lighting circuits for correct operation through their control devices.
 3. Alarm and interlock systems: Produce malfunction symptoms in operating systems to test alarm and interlock systems. In addition, all specific tests described in the fire alarm system shall be performed.
 4. Circuit numbering verification: Select on a random basis various circuit breakers in the panelboards and cycle them on and off to verify compliance of the typed panel directories with actual field wiring.
 5. Voltage check:
 - a. At completion of job, check voltage at several points of utilization on the system that has been installed under this Contract. During test, energize all installed loads.
 - b. Adjust taps on transformers to give proper voltage, which is 118 to 122 volts for 120 volt nominal systems and proportionately equivalent for higher voltage systems. If proper voltage cannot be obtained, inform the Owner and the serving Utility Company.
- C. Contractor shall provide test power required when testing equipment before service energization and coordinate availability of test power with General Contractor after service energization. The Contractor shall provide any specialized test power as needed or specified herein.
- D. Testing safety and precautions:
1. Safety practices shall include the following requirements:
 - a. Applicable State and Local safety operating procedures.
 - b. OSHA
 - c. NSC
 - d. NFPA 70E
 2. All tests shall be performed with apparatus de-energized and grounded except where otherwise specifically required ungrounded by test procedure.
- E. Calibration of test equipment:
1. Testing Agency shall have calibration program that assures test instruments are maintained within rated accuracy.
 2. Instruments shall be calibrated in accordance with the following frequency schedule:
 - a. Field instruments: Analog, 6 month maximum; Digital, 12 months

ELECTRICAL BASIC REQUIREMENTS

SECTION 26 0100

3595001000

- maximum.
- b. Laboratory instruments: 12 months.
- c. Leased specialty equipment: 12 months where accuracy is guaranteed by lessor.
- 3. Dated calibration labels shall be visible on test equipment.
- 4. Records, which show date and results of instruments calibrated or tested, must be kept up-to-date.
- 5. Up-to-date instrument calibration instructions and procedures shall be maintained for test instrument.
- 6. Calibration standards shall be of higher accuracy than instrument tested.
- 7. Equipment used for field testing shall be more accurate than instrument being tested.
- F. Coordinate with General Contractor regarding testing schedule and availability of equipment ready for testing.
- G. Notify Owner one week in advance of any testing.
- H. Any products which fail during the tests or are ruled unsatisfactory by the Owner's Representative shall be replaced, repaired, or corrected as prescribed by the Owner's Representative at the expense of the Contractor. Tests shall be performed after repairs, replacements or corrections until satisfactory performance is demonstrated.
- I. Testing Agency shall maintain written record of tests and shall assemble and certify final test report. All test results/reports shall be submitted to the Electrical Engineer for review.
- J. Include all test results in the maintenance manuals.

3.5 CLEANING

- A. Prior to energizing of electrical equipment, the Contractor shall thoroughly clean the interior of enclosures from construction debris, scrap wire, etc. using Manufacturer's approved methods and materials.
- B. Upon completion of Project, prior to final acceptance, the Contractor shall thoroughly clean both the interior and exterior of all electrical equipment per Manufacturers approved methods and materials. Remove paint splatters and other spots, dirt, and debris.
- C. Touch-up paint any marks, blemishes or other finish damage suffered during installation.

- END OF SECTION -

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes conduit, surface raceways, J-hooks, wireways, outlet boxes, pull and junction boxes, concrete pullboxes and vaults, floor boxes.

1.2 REFERENCES

1.3 AMERICAN NATIONAL STANDARDS INSTITUTE:

- A. ANSI C80.1 - Rigid Steel Conduit, Zinc Coated.
- B. ANSI C80.3 - Specification for Electrical Metallic Tubing, Zinc Coated.

1.4 NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION:

- A. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum).
- B. NEMA FB 1 - Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit and Cable Assemblies.
- C. NEMA OS 1 - Sheet Steel Outlet Boxes, Device Boxes, Covers, and Box Supports.
- D. NEMA OS 2 - Nonmetallic Outlet Boxes, Device Boxes, Covers, and Box Supports.
- E. NEMA RN 1 - Polyvinyl Chloride (PVC) Externally Coated Galvanized Rigid Steel Conduit and Intermediate Metal Conduit.
- F. NEMA TC 2 - Electrical Polyvinyl Chloride (PVC) Tubing and Conduit.
- G. NEMA TC 3 - PVC Fittings for Use with Rigid PVC Conduit and Tubing.

1.5 SYSTEM DESCRIPTION

- A. Raceway and boxes located as indicated on Drawings, and at other locations required for splices, taps, wire pulling, equipment connections, and compliance with regulatory requirements. Raceway and boxes are shown in approximate locations unless dimensioned. Provide raceway to complete wiring system.
- B. All wiring shall be installed in raceway.
- C. Provide raceway as follows:
 - 1. Underground: Provide thickwall nonmetallic conduit. Provide cast metal boxes or nonmetallic handhole.
 - 2. In Slab Above Grade: Not permitted.
 - 3. Below Slab on Grade: Use thickwall nonmetallic conduit. Terminate with coated rigid steel elbows and short length of coated rigid steel conduit out of concrete.

RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

SECTION 26 0533

3595001000

4. Outdoor Locations, Above Grade: Provide galvanized rigid steel conduit. Provide cast metal outlet, pull, and junction boxes.
5. Wet and Damp Locations: Provide galvanized rigid steel conduit. Provide cast metal outlet, junction, and pull boxes. Provide flush mounting outlet box in finished areas.
6. Concealed Dry Locations: Provide electrical metallic tubing. Provide sheet-metal boxes. Provide flush mounting outlet box in finished areas. Provide hinged enclosure for large pull boxes where shown on drawings. Provide J-hooks when shown on plans.
7. Exposed Interior Dry Locations: Use rigid steel conduit or intermediate metal conduit below eight feet or where subject to damage. Use rigid steel conduit, intermediate metal conduit, or electrical metallic tubing above eight feet or in electrical, mechanical or telecommunication rooms. Use sheet-metal or cast metal boxes. Use flush mounting outlet box in finished areas. Provide hinged enclosure for large pull boxes.

1.6 DESIGN REQUIREMENTS

- A. Minimum Raceway Size: 0.75 inch unless otherwise specified.
- B. Minimum Raceway Size for Data Communications: 1.00 inch unless otherwise specified.
- C. Minimum Raceway Size for Telecommunications: 1.00 inch unless otherwise specified.
- D. Minimum Raceway Size for AV Systems: 1.00 inch unless otherwise specified.

1.7 CLOSEOUT SUBMITTALS

- A. Project Record Documents:
 1. Record actual routing of conduits larger than 2 inches.
 2. Record actual locations and mounting heights of outlet, pull, and junction boxes.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Protect conduit from corrosion and entrance of debris by storing above grade. Provide appropriate covering.
- B. Protect PVC conduit from sunlight.

1.9 COORDINATION

- A. Coordinate mounting heights, orientation and locations of outlets mounted above counters, benches, and backsplashes.
- B. Coordinate Work of this Division and Work of other Divisions in advance of installation. Provide additional Work to overcome tight conditions at no increase in Contract Sum.
- C. Coordinate installation of outlet boxes for equipment specified in other divisions.

PART 2 - PRODUCTS

2.1 METAL CONDUIT

- A. Rigid Steel Conduit: ANSI C80.1.
- B. Rigid Aluminum Conduit: ANSI C80.5.
- C. Intermediate Metal Conduit (IMC): Rigid steel.
- D. Fittings and Conduit Bodies: NEMA FB 1. Fittings shall be steel/malleable iron with threaded fittings. Use insulated metallic bushings with lug where ground connections are required. Use plastic bushing for non-bonding applications.

2.2 PVC COATED METAL CONDUIT

- A. Product Description: NEMA RN 1; rigid steel conduit with external PVC coating, 40 mil thick.
- B. Fittings and Conduit Bodies: NEMA FB 1; steel fittings with external PVC coating to match conduit.

2.3 FLEXIBLE METAL CONDUIT

- A. Product Description: Interlocked steel construction.
- B. Fittings: NEMA FB 1.

2.4 LIQUIDTIGHT FLEXIBLE METAL CONDUIT

- A. Product Description: Interlocked steel construction with PVC jacket.
- B. Fittings: NEMA FB 1.

2.5 ELECTRICAL METALLIC TUBING (EMT)

- A. Product Description: ANSI C80.3; galvanized tubing.
- B. Fittings and Conduit Bodies: NEMA FB 1; steel couplings and connectors. Box connectors shall have with insulated throat. Set screw type couplings.

2.6 NONMETALLIC CONDUIT

- A. Product Description: NEMA TC 2; Schedule 40 PVC.
- B. Fittings and Conduit Bodies: NEMA TC 3.

2.7 SURFACE RACEWAY (WIREMOLD)

- A. Product Description: Surface raceway as shown on plans. Raceway shall be Wiremold or equal.

RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

SECTION 26 0533

3595001000

- B. Fittings: Provide all supports, adapters, clips, elbows, covers, device fittings, and other hardware as required for a complete installation. Provide B-Line "transition" boxes to clear offset surfaces. Supports shall be concealed, exposed straps are not allowed.
- C. Finish:
 - 1. Steel raceway and associated transition boxes and exposed hardware shall be spray painted with two coats of semi-gloss acrylic enamel paint, color as directed by Architect.
 - 2. Aluminum raceway shall be provided with factory finish, color as directed by Architect. Transition boxes shall be spray painted with two coats of semi-gloss acrylic enamel paint, color as directed by Architect.
 - 3. Plastic raceway shall be provided with factory finish, color as directed by Architect. Transition boxes shall be spray painted with two coats of semi-gloss acrylic enamel paint, color as directed by Architect.
 - 4. Coordinate all colors with Architect prior to ordering.

2.8 J-HOOKS

- A. Product Description: Low voltage signal cable J-Hooks shall be Panduit. Provide with support device for construction encountered.

2.9 WIREWAY

- A. Product Description: General purpose for indoor applications and raintight type for outdoor locations wire way.
- B. Knockouts: Manufacturer's standard.
- C. Cover: Hinged cover with full gaskets.
- D. Connector: Flanged.
- E. Fittings: Lay-in type with removable top, bottom, and side; captive screws and drip shield for outdoor.
- F. Finish: Rust inhibiting primer coating with gray enamel finish.

2.10 OUTLET BOXES

- A. All boxes shall be suitable for the environment in which they are installed.
- B. Sheet Metal Outlet Boxes: NEMA OS 1, galvanized steel.
 - 1. Luminaire and Equipment Supporting Boxes: Rated for weight of equipment supported; furnish 0.5-inch male fixture studs where required.
 - 2. Boxes for shall be 1.5-inch-deep by 4-inch square minimum for single devices.
 - 3. Boxes for shall be 1.5-inch-deep by 4-11/16 inch square minimum for two devices.
 - 4. Boxes for data and signal outlets shall be 2-1/8-inch-deep by 4-11/16-inch square minimum.
 - 5. Concrete Ceiling Boxes: Concrete type.

RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

SECTION 26 0533

3595001000

6. Provide rings as required.

- C. Cast Boxes: NEMA FB 1, Type FD, aluminum. Furnish gasketed cover by box manufacturer. Furnish threaded hubs.

2.11 BOX EXTENSIONS

- A. At rooms being remodeled and where existing walls are to receive new finish material, replace existing plaster rings with new rings.

2.12 PULL AND JUNCTION BOXES

- A. Boxes having an internal volume less than 100 cubic inches shall be as specified for outlet boxes. Boxes having internal volume greater than 100 cubic inches shall be of panelboard type construction except that covers shall be secured by screws or bolts.
- B. Boxes exposed to rain or installed in wet locations shall be specifically designed for the purpose.
- C. All boxes shall be installed so that covers are accessible after completion of the installation.
- D. Boxes shall not be installed in finished areas unless specific approval for such installation is granted by Architect.

2.13 CONCRETE PULLBOXES AND VAULTS

- A. Boxes: Boxes shall be precast, high density reinforced concrete. In areas of vehicular traffic, boxes shall be H20 rated.
- B. Extensions: Extensions shall be provided at each pullbox. Provide a minimum of (1) extension. Provide additional extension(s) as required to provide space in box for code required cable bending.
- C. Covers: Covers in concrete or asphalt shall be galvanized. In all other areas, covers shall be steel checker plate. In areas of vehicular traffic, lids shall be galvanized steel, H20 rated. All covers shall be provided with hold-down bolts.
- D. Floor: Provide poured concrete slab as detailed on plans. At H20 rated boxes, provide manufacturer's concrete slab.
- E. Size: Provide size as noted on plans. If size is not shown, provide boxes sized per codes.
- F. Labeling: Covers shall be factory marked as shown on plans.

2.14 FLUSH MULTI SERVICE FLOOR BOXES (4 PORT)

- A. Floor boxes shall be cast iron, fully adjustable, Walker RFB4-CI-1 with FPBTCAL cover. Provide brackets required to mount devices shown on plans. Provide blank plates at unused ports.

RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS
SECTION 26 0533
3595001000

2.15 FLUSH MULTI SERVICE FLOOR BOXES (11 GANG):

- A. Floor boxes shall be steel, fully adjustable, Walker RFB11 with RFB119BTCAL cover. Provide brackets required to mount devices shown on plans. Provide blank plates at unused ports.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify outlet locations and routing and termination locations of raceway prior to rough-in.

3.2 EXISTING WORK

- A. Remove exposed abandoned raceway, including abandoned raceway above accessible ceiling finishes. Cut raceway flush with walls and floors, and patch surfaces.
- B. Remove concealed abandoned raceway to its source.
- C. Disconnect abandoned outlets and remove devices. Remove abandoned outlets when raceway is abandoned and removed. Install blank cover for abandoned outlets not removed.
- D. Maintain access to existing boxes and other installations remaining active and requiring access. Modify installation or provide access panel.
- E. Extend existing raceway and box installations using materials and methods [compatible with existing electrical installations, or] as specified.
- F. Clean and repair existing raceway and boxes to remain or to be reinstalled.
- G. At rooms being remodeled and where existing walls are to receive new finish material, replace existing plaster rings with new rings with depth required to bring box flush with new finish. Contractor shall review Architectural drawings prior to bid to note walls receiving new finishes (tackboards, sheetrock, etc.) and include the necessary work in bid.

3.3 INSTALLATION

- A. Ground and bond raceway and boxes.
- B. Fasten raceway and box supports to structure and finishes.
- C. Identify raceway and boxes.
- D. Arrange raceway and boxes to maintain headroom and present neat appearance.

3.4 INSTALLATION - RACEWAY

- A. Raceway routing is shown in approximate locations unless dimensioned. Route to complete wiring system.

RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

SECTION 26 0533

3595001000

- B. Unless otherwise specified, all raceway shall be installed concealed. Raceway may be run exposed on unfinished walls, in attic spaces, in electrical rooms and when routed to surface panels, cabinets or gutters.
- C. Arrange raceway supports to prevent misalignment during wiring installation.
- D. Support raceway using coated steel or malleable iron straps, lay-in adjustable hangers, clevis hangers, and split hangers.
- E. Group related raceway; support using conduit rack. Construct rack using steel channel and provide space on each for 25 percent additional raceways.
- F. Do not support raceway with wire or perforated pipe straps. Remove wire used for temporary supports
- G. Do not attach raceway to ceiling support wires or other piping systems.
- H. Construct wire way supports from steel channel.
- I. Route exposed raceway parallel and perpendicular to walls.
- J. Route raceway installed above accessible ceilings parallel and perpendicular to walls.
- K. Route conduit in and under slab from point-to-point.
- L. Maintain clearance between raceway and piping for maintenance purposes.
- M. Maintain 12-inch clearance between raceway and surfaces with temperatures exceeding 104 degrees F.
- N. Cut conduit square using saw or pipe cutter; de-burr cut ends.
- O. Bring conduit to shoulder of fittings; fasten securely.
- P. Join nonmetallic conduit using cement as recommended by manufacturer. Wipe nonmetallic conduit dry and clean before joining. Apply full even coat of cement to entire area inserted in fitting. Allow joint to cure for minimum 20 minutes.
- Q. Install conduit hubs to fasten conduit to sheet metal boxes in damp and wet locations and to cast boxes.
- R. Install no more than equivalent of three 90-degree bends between boxes. Install conduit bodies to make sharp changes in direction, as around beams. Install factory elbows for bends in metal conduit larger than 2-inch size.
- S. Avoid moisture traps; install junction box with drain fitting at low points in conduit system.
- T. Install fittings to accommodate expansion and deflection where raceway crosses seismic and expansion joints.
- U. Install suitable pull string or cord in each empty raceway except sleeves and nipples.

RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

SECTION 26 0533

3595001000

- V. Install suitable caps to protect installed conduit against entrance of dirt and moisture.
- W. Surface Raceway:
 - 1. Anchor raceway to structural members using screws. Supports shall be concealed. Space screws 24" maximum on center. Each run shall have a minimum of (2) screws.
 - 2. Mount plumb and level.
 - 3. Install insulating bushings and inserts at connections to outlets and corner fittings.
 - 4. Raceway shown on plans is schematic. Contractor shall coordinate exact routing and installation with building conditions and provide all parts, pieces, elbows, transition boxes and other items as required for a complete, closed and professionally installed installation.
 - 5. Coordinate exact routing with Architect prior to installation.
- X. J-Hooks:
 - 1. Provide J-hooks 48" maximum on center.
 - 2. All cable to be run parallel and perpendicular to building lines.
 - 3. Provide mounting hardware as required.
 - 4. Provide Unistrut channels between structural members as required.
 - 5. Provide 24" long 2" conduit sleeves through walls, draft stops, etc. Provide as many as necessary to accommodate cables in contract plus two extra capped at each end for future cabling. All conduits shall be provided with bushed ends.
- Y. Close ends and unused openings in wire way.

3.5 EXCAVATING AND TRENCHING:

- A. Perform all excavations as required for the installation of the work included under this Section, including shoring of earth banks to prevent cave-ins and to protect workmen and equipment.
- B. Restore all surfaces, roadways, walks, curbs, walls, existing underground installation, etc., damaged or cut as a result of the excavations to their original condition in a manner approved by the Architect.
- C. Stop machine excavation for trenches, in solid ground, several inches above required grade line, then trim trench bottom by hand to accurate grade so that a firm and uniform bearing throughout entire length of duct is provided. In lieu of above hand excavation in bottom of trench, Contractor may excavate to depth no less than 6" below required grade line and place a bed of sand or granular soil, properly compacted to provide a uniform grade and to provide a firm support for duct throughout its entire length.
- D. Minimum conduit depth of pipe crown shall be 2'0" below finished or natural grade, unless detailed otherwise on Drawings. Conduits under parking lots, roadways, driveways, fire truck access routes, and other areas subject to vehicular traffic shall be installed a minimum of 24" below grade.

3.6 BACKFILLING:

- A. No backfilling operations shall begin until the required tests and inspection has been made. Should any of the work be enclosed or covered up before it has been approved, Contractor shall, at his expense, uncover the work.
- B. After it has been inspected, tested, and approved, he shall make all repairs necessary to restore the work of other contractors to the condition in which it was found at the time of uncovering.
- C. Except under existing paved area, walks, roads, or similar surfaces, and in cases where rock is encountered, backfill more than 12" above the top of the pipe shall be made using suitable excavated material placed in 6" layers measured before compaction, and tamped by machine.
- D. Surface work shall be replaced to match the existing.
- E. Entire backfill for bored excavations under existing pavement, walks, roads, or similar surfaces, shall be made with clean sand compacted by flooding.
- F. The contractor shall install a marking tape 6" below grade and directly above all electrical conduits. The tape shall consist of a 4 mil insert plastic film specifically formulated for prolonged use underground. It shall be highly resistant to alkalis, acids and other destructive agents found in the soil. Tape shall have a minimum tensile strength of 20 lbs. per 3" with strips and a minimum elongation of 500%. Tape shall bear a continuous painted message repeated every 16" to 36" warning of the installation buried below. The message shall read "CAUTION – ELECTRICAL POWER LINE BURIED BELOW" or "CAUTION – ELECTRICAL SIGNAL LINES BURIED BELOW" as applies. Installation instruction for the tape shall be printed with each message along the entire length. The tape shall be as that manufactured by Reef Industries, Inc., or approved equal. For those installations involving non-metallic pipe, tape shall be aluminum foil encased in two layers of inert plastic film enabling the tape to be inductively located. Terre Tape "D" Warning Tapes are acceptable. When conduit below is plastic, tape shall have metallic content and shall respond to metal detectors. Do not exclude this. It will be required to verify the installation of this tape.

3.7 FLASHING AND SEALING:

- A. Flash and counterflash roof and wall penetrations in manner described under other applicable sections of this Specification and as approved by the Architect.
- B. Conduits, ducts, etc., passing through finished walls and ceilings shall be fitted with steel escutcheon plates, chrome or paint finish as directed.
- C. Conduits which penetrate floor slabs and concrete or masonry walls shall be grouted and sealed watertight at penetration.
- D. Conduits penetrating exterior walls other than concrete or masonry shall be sealed watertight with polyurethane sealant.

RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

SECTION 26 0533

3595001000

- E. Underground conduits stubbing up into a room shall be sealed around cables or pullstring with foam sealant.
- F. All flashing and sealing shall be provided by this Contractor.

3.8 INSTALLATION – BOXES

- A. Boxes shall be accurately placed as shown on Drawings or as close thereto as possible. Contractor shall refer to Drawings, specifications, and submittals covering work of the other trades to coordinate outlet location. In the event of conflict between planned locations of outlet and other equipment or furnishing, Contractor shall not proceed until direction has been given by Architect.
- B. Unless otherwise specified or shown on Drawings, boxes shall be flush mounted with front edge of box or ring flush with wall or ceiling finish. Use plaster ring of appropriate depth in plastered or gypboard applications. Contractor shall review architectural drawings and note wall and ceiling construction and finishes for each wall.
- C. Boxes shall not be installed back-to-back in walls. To prevent sound transfer, outlets, switches, etc. shown on opposing sides of the same wall shall be installed in separate stud spaces, except that outlets installed at different elevations may occupy the same stud space when box separation exceeds 18". Where these requirements cannot be met, Contractor shall provide insulation material between boxes.
- D. Orient boxes to accommodate wiring devices.
- E. Install pull boxes and junction boxes above accessible ceilings and in unfinished areas only.
- F. In Accessible Ceiling Areas: Install outlet and junction boxes no more than 6 inches from ceiling access panel or from removable recessed luminaire.
- G. Locate flush mounting box in masonry wall to require cutting of masonry unit corner only. Coordinate masonry cutting to achieve neat opening.
- H. Install stamped steel bridges to fasten flush mounting outlet box between studs.
- I. Install flush mounting box without damaging wall insulation or reducing its effectiveness.
- J. Install adjustable steel channel fasteners for hung ceiling outlet box.
- K. Do not fasten boxes to ceiling support wires or other piping systems.
- L. Support boxes independently of conduit.
- M. Install gang box where more than one device is mounted together. Do not use sectional box.
- N. Install gang box with plaster ring for single device outlets.

3.9 INSTALLATION CONCRETE PULLBOXES AND VAULTS

- A. Install boxes flush with finished grade or surface material.
- B. Install hold down bolts for all covers.
- C. Ground bond steel cover plate with insulated green grounding conductor.
- D. Grout between box and extension(s).
- E. Any box installed in areas of vehicular traffic shall be H20 rated. Contractor shall verify this requirement prior to ordering.

3.10 INTERFACE WITH OTHER PRODUCTS

- A. Install conduit to preserve fire resistance rating of partitions and other elements.
- B. Route conduit through roof openings for piping and ductwork or through suitable roof jack with pitch pocket. Coordinate location with roofing installation.
- C. Locate outlet boxes to allow luminaires positioned as indicated on reflected ceiling plan.
- D. Align adjacent wall mounted outlet boxes for switches, thermostats, and similar devices.

3.11 ADJUSTING

- A. Adjust flush-mounting outlets to make front flush with finished wall material.
- B. Install knockout closures in unused openings in boxes.

3.12 CLEANING

- A. Clean interior of boxes to remove dust, debris, and other material.
- B. Clean exposed surfaces and restore finish.

- END OF SECTION -

PART 1 – GENERAL

1.1 SUMMARY

- A. This section describes the requirements for the cabinets and enclosures for this project.

1.2 REFERENCES

- A. National Electrical Manufacturer's Association (NEMA):
 - 1. NEMA 250; Enclosures for Electrical Equipment.
 - 2. NEMA ICS 1; Industrial Control and Systems.
 - 3. NEMA ICS 4; Terminal Blocks and Industrial use.
 - 4. NEMA ICS 6; Enclosures for Industrial Controls and Systems.
- B. Underwriters Laboratories (UL):
 - 1. UL 50; Enclosures for Electrical Equipment.
 - 2. UL 65; Standards for Wired Cabinets.
 - 3. UL 1059; Terminal Blocks.
 - 4. UL 1773; Termination Boxes.

1.3 SUBMITTALS

- A. Product Data: Submit manufacturer's standard data for enclosures, and terminal cabinets.
- B. Manufacturer's Instructions: Submit application conditions and limitations of use stipulated by product testing agency specified under Regulatory Requirements. Include instructions for storage, handling, protection, examination, preparation, and installation of product.

1.4 QUALITY ASSURANCE

- A. All materials, equipment and parts comprising the units specified herein shall be new, unused, and currently under production.
- B. Only products and applications listed in this Section may be used on the Project unless otherwise submitted.

PART 2 - PRODUCTS

2.1 CABINETS AND ENCLOSURES

- A. Description: Interior Locations: NEMA 1. Exterior locations: NEMA 3R
- B. Construction: Shall be code gauge galvanized steel with standard concentric knockouts for conduit terminations. Size shall be as indicated on Drawings.

CABINETS AND ENCLOSURES
SECTION 26 2716
3595001000

- C. Backboard: Furnish 5/8-inch-thick plywood backboard for mounting terminal blocks. Paint with (3) coats of fire retardant white paint.
- D. Finish: Manufacturer's standard gray baked enamel finish.
- E. Covers: Continuous hinged steel door, lockable and keyed to match panelboard locks. Provide padlock hasp at exterior locations.
- F. Mounting:
 - 1. Flush cabinets shall be furnished with concealed trim clamps and shall be not less than 4 inches deep.
 - 2. Surface cabinets shall be furnished with screw cover trim, flush hinged door and shall not be less than 6 inches deep.

2.2 SIGNAL TERMINAL BACKBOARDS

- A. Furnish cabinet with 3/4-inch fire retardant plywood mounting backboard on interior unless otherwise indicated on Drawings. 8' high x width shown on plans or as required
- B. Finish: Paint with (3) coats of fire-retardant white paint

2.3 TERMINAL BLOCKS AND ACCESSORIES

- A. Terminal blocks: NEMA ICS 4; UL listed.
- B. Power terminals: Unit construction type, closed-back with tubular pressure screw connections, rated 600 volts.
- C. Identification: Identify terminal strips with permanent numbers.
- D. Wiring diagram: Provide wiring diagram in protective pocket on inside front cover of cabinet. Diagram shall indicate control wiring, connections, and layout of components within enclosure.

2.4 HINGED COVER ENCLOSURES

- A. Description: NEMA 250, Type 1 (Interior) and 3R (Exterior) steel enclosure
 - 1. Covers: Continuous hinge, held closed by flush latch operable by key.
 - 2. Furnish interior plywood panel for mounting terminal blocks and electrical components; finish with white enamel.
 - 3. Enclosure Finish: Manufacturer's standard enamel.

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Contractor shall thoroughly examine Project site conditions for acceptance of cabinets and enclosures installation to verify conformance with Manufacturer and Specification tolerances. Do not commence with installation until all conditions are made satisfactory.

3.2 INSTALLATION

- A. Set cabinets and enclosures plumb and symmetrical with building lines. Furnish and install all construction channel bolts, angles, etc. required to mount all equipment furnished under this Section of the Specifications.
- B. Cabinets and enclosures shall be anchored and braced to withstand seismic forces calculated in accordance with that referenced in Section 26 0100: Basic Electrical Requirement.
- C. "Train" interior wiring, bundle and clamp using specified plastic wire wraps.
- D. Install interior cabinets with top of enclosure 6'6" above finished floor.
- E. Install exterior cabinets with top of enclosure 6'6" above finished grade.
- F. Replace doors or trim exhibiting dents, bends, warps or poor fit that may impede ready access, security or integrity.
- G. Terminate conduit in cabinet with lock nut and grounding bushing.
- H. Terminate wiring on terminal blocks and identify each with heat shrink tags.

3.3 CLEANING

- A. Touch up scratched or marred surfaces to match original finish.
- B. Clean electrical parts to remove conductive and harmful materials.
- C. Remove dirt and debris from enclosure.
- D. Clean existing panelboards and load centers to remain or to be reinstalled.

- END OF SECTION -

PART 1— GENERAL

1.1 SUMMARY

- A. Section Includes
 - 1. This section describes the requirements for the circuit protective devices for this project.

1.2 REFERENCES

- A. Federal Specification (FS):
 - 1. FS W-C-375; Circuit Breakers, Molded Case, Branch Circuit and Service.
 - 2. FS W-F-870; Fuseholders (for Plug and Enclosed Cartridge Fuses).
- B. Underwriters Laboratories, Inc. (UL):
 - 1. UL 248(1-16); Low-Voltage Fuses.
 - 2. UL 489; Molded-Case Circuit Breakers, Molded-Case Switches and Circuit Breaker Enclosures.
 - 3. UL 512; Fuseholders.
 - 4. UL 1066; Low Voltage AC and DC Power Circuit Breakers Used in Enclosures.
- C. National Electrical Manufacturer Association (NEMA):
 - 1. NEMA AB 1; Molded Case Circuit Breakers.

1.3 SUBMITTALS

- A. Product Data
- B. Operation and Maintenance (O&M) Manuals

1.4 QUALITY ASSURANCE

- A. All materials, equipment and parts comprising the units specified herein shall be new, unused, and currently under production.
- B. Only products and applications listed in this Section may be used on the Project unless otherwise submitted.

1.5 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Delivery: Overcurrent Protective Device components shall not be delivered to the Project site until protected storage space is available. Storage outdoors covered by rainproof material is not acceptable. Equipment damaged during shipment shall be replaced and returned to Manufacturer at no cost to Owner.

CIRCUIT PROTECTIVE DEVICES

SECTION 26 2800

3595001000

- B. Storage: Store in a clean, dry, ventilated space free from temperature extremes. Maintain factory wrapping or provide a heavy canvas/plastic cover to protect units from dirt, water, construction debris and traffic. Provide heat where required to prevent condensation.
- C. Handling: Handle in accordance with Manufacturer's written instructions. Be careful to prevent internal component damage, breakage, denting and scoring. Damaged units shall not be installed. Replace damaged units and return equipment to Manufacturer.

PART 2 - PRODUCTS

2.1 FUSES

- A. General: All power fuses shall be time-delay, high interrupting (300 K AIC), current limiting type, unless otherwise noted on the Drawings. All fuses shall be the product of a single Manufacturer and shall be selectively coordinated when applied in 2:1 ratios. Types of fuses shall be as follows:
 - 1. 0 - 600 amperes: UL Class J, dual element, time delay type fuse with separate overload and short-circuit elements. The fuse shall hold 500% of rated current for a minimum of 10 seconds.
 - 2. 601 - 4000 amperes: UL Class L, time delay type fuses with 99.9% pure silver fuse links and "O-rings" to seal between the end bells and the fuse barrel. Fuses shall hold 500% of rated current for a minimum of 4 seconds, clear 20 times rated current in 0.01 seconds or less.
 - 3. Motor branch circuit fuses (0-600 amperes): UL Class J dual element, time delay type fuse. Motor branch circuit fuses shall be sized for Type 2 coordination for the motor controller and back-up motor overload protection and shall be coordinated with motor starter overload relay heaters.
- B. Control and instrument fuses shall be suitable for installing in blocks or fuse holders. Exact type and rating shall be as recommended by the Manufacturer of the equipment being protected.
- C. Fuses for installation in current limiting circuit breakers or motor circuit protectors shall meet the specific requirements of the Manufacturers of that equipment to ensure compatibility.

2.2 MOLDED CASE CIRCUIT BREAKERS

- A. Unless noted otherwise, circuit breakers shall be molded case, bolt on and trip indicating.
- B. Where stationary molded case circuit breakers are indicated on the Drawings to be current limiting type, they shall be current limiting as defined by UL 489 and shall not employ any fusible elements.
- C. Circuit breakers shall have interrupting capacity not less than that indicated on the Drawings or if not indicated, not less than 25,000 RMS symmetrical amps for 480

volt systems and 10,000 RMS symmetrical amps for 208 volt systems.

- D. Covers shall be sealed on non-interchangeable breakers and trip unit covers shall be sealed on interchangeable trip breakers to prevent tampering. Circuit breaker ratings shall be clearly visible after installation or engraved nameplates shall be provided stating the rating. All ferrous parts shall be plated to minimize corrosion.
- E. Circuit breakers shall be toggle, quick-make and quick-break operating mechanisms with trip-free feature to prevent contacts being held closed against overcurrent conditions in the circuit. Trip position of the breakers shall be clearly indicated by operating handles moving to a center position.
- F. Multipole breakers shall have a single handle to open and close all contacts simultaneously in both manual operation and under automatic tripping. Interpole barriers shall be provided inside the breaker to prevent any phase-to-phase flashover. Each pole of the breaker shall have means for Arc extinguishing.
- G. All terminals shall be rated for aluminum or copper wire.
- H. Unless noted otherwise, circuit breakers with trip ratings 400 amp and smaller shall be ambient temperature compensated, thermal magnetic type unless otherwise noted. Breakers shall be of full size, 1" per pole type. Panels with more than one branch breaker larger than 100 amps shall be installed in distribution type panels.
- I. Accessories: Provide accessories as noted on the Drawings, i.e. shunt-trip, auxiliary contacts, undervoltage trip, alarm switch, etc.
- J. Spaces in the boards shall be able to accept any combination of 1, 2 or 3 pole circuit breakers as indicated. Provide all necessary bus, device supports and mounting hardware sized for frame, not trip rating.
- K. Series rated breakers are not acceptable unless specifically noted on the Drawings.

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Contractor shall thoroughly examine Project site conditions for acceptance of cabinets and enclosures installation to verify conformance with Manufacturer and Specification tolerances. Do not commence with installation until all conditions are made satisfactory.

3.2 INSTALLATION

- A. Install overcurrent protective devices in accordance with Manufacturer's written instructions, as indicated on the Drawings and as specified herein.
- B. Tighten electrical connectors and terminals; including screws and bolts, in accordance with equipment Manufacturers published torque-tightening values for

CIRCUIT PROTECTIVE DEVICES
SECTION 26 2800
3595001000

equipment connectors. Where Manufacturers torque requirements are not indicated tighten connectors and terminals to comply with tightening torque specified in UL Standard 486A.

- C. Install overcurrent protective devices and accessories in accordance with Manufacturer's written instructions and with recognized industry practices to ensure that protective devices comply with requirements. All devices shall be installed in accordance with applicable CEC and NEMA standards for installation.
- D. Circuit breakers serving "Fire Alarm Control Panel(s)" shall be red in color.

3.3 FIELD QUALITY CONTROL

- A. The Contractor shall supply a suitable and stable source of electrical power to each test site.
- B. Testing of overcurrent protective devices shall be done only after all devices are installed and system is energized.
- C. Prefunctional testing:
 - 1. Visual and mechanical inspection:
 - a. Inspect for physical damage, defects alignment and fit.
 - b. Perform mechanical operational tests in accordance with Manufacturer's instructions.
 - c. Compare nameplate information and connections to Contract Documents.
 - d. Check tightness of all control and power connections.
 - e. Check that all covers, barriers and doors are secure.
 - 2. Electrical tests:
 - a. Circuit continuity: All feeders shall be tested for continuity. All neutrals shall be tested for improper grounds.
 - b. Determine that circuit breaker will trip under overcurrent condition, with tripping time in conformance with NEMA AB 1 requirements.
 - c. Test all circuit breakers with frame size 225 amps and larger and 10 percent of all circuit breakers with frame sizes less than 225 amps in each panelboard, distribution board, switchboard, etc. unless otherwise noted.
- D. Contractor shall replace at no costs to the Owner all devices which are found defective or do not operate within factory specified tolerances.
- E. Contractor shall submit the final test report for review prior to Project closeout and final acceptance by the Owner. Test report shall indicate test dates, devices tested, results, observation, deficiencies and remedies. Test report shall be included in the operation and maintenance manuals.

3.4 ADJUSTING

CIRCUIT PROTECTIVE DEVICES
SECTION 26 2800
3595001000

- A. Adjust circuit breaker trip settings for coordination with other overcurrent protective devices in system.
- B. Adjust circuit breaker trip settings for adequate protection from overcurrent and fault currents.

3.5 CLEANING

- A. Upon completion of Project prior to final acceptance the Contractor shall thoroughly clean overcurrent protective devices per Manufacturer's approved methods and materials. Remove paint splatters and other spots, dirt and debris.

- END OF SECTION -

PART 1 - GENERAL

1.1 SUMMARY

- A. This section describes the basic requirements for the fire alarm system work on this project.

1.2 REFERENCES AND STANDARDS

- A. California Fire Code (CFC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. American National Standards Institute, Inc. (ANSI): ANSI C62.41
- C. National Fire Protection Association (NFPA): 72, 101
- D. Underwriter Laboratories, Inc. (UL)
 - 1. UL 38; Manual Signaling Boxes Fire Alarm Systems.
 - 2. UL 268; Smoke Detectors for Fire Alarm Signaling Systems.
 - 3. UL 268 A; Smoke Detectors for Duct Application.
 - 4. UL 464; Audible Signal Appliances.
 - 5. UL 497B; Protectors for Data Communications and Fire Alarm Circuits.
 - 6. UL 521; Heat Detectors for Fire Protective Signaling Systems.
 - 7. UL 864; Control Units and Accessories for Fire Alarm Systems.
 - 8. UL 1424; Cables for Power-Limited Fire-Alarm Circuits.
 - 9. UL 1480; Speakers for Fire Alarm, Emergency and Commercial and Professional Use.
 - 10. UL 1481; Power Supplies for Fire-Protective Signaling Systems.
 - 11. UL 1638 Visual Signaling Appliances Standard.
 - 12. UL 1711; Amplifiers for Fire Protective Signaling Systems.
 - 13. UL 1971 Signal Devices for Hearing Impaired.
- E. International Engineering Consortium (IEC): IEC 60849
- F. Factory Mutual System (FM) approval guide: FM P7825

1.3 SUBMITTALS

- A. Product Data
- B. Operation and Maintenance (O&M) Manuals
- C. Field Test Reports

**FIRE ALARM SYSTEM
SECTION 26 6116
3595001000**

1.4 QUALITY ASSURANCE

- A. All materials, equipment and parts comprising the units specified herein shall be new, unused, and currently under production.
- B. Only products and applications listed in this Section and in the Electrical Drawings may be used on the Project unless otherwise submitted.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Products furnished by the Manufacturers indicated in the Electrical Drawings and this section shall be acceptable if in compliance with all features specified herein
 - 1. Gamewell-FCI
 - 2. Cooper Wheelock

2.2 CONDUIT AND WIRE

- A. Conduit:
 - 1. Conduit shall be in accordance with the California Electrical Code (CEC).
 - 2. Where required, all wiring shall be installed in conduit. Conduit fill shall not exceed 40 percent of interior cross-sectional area where three or more cables are contained within a single conduit.
 - 3. Cable must be separated from any open conductors of power, or Class 1 circuits, and shall not be placed in any conduit, junction box or raceway containing these conductors, per CEC Article 760-29.
 - 4. Wiring for 24-volt DC control, alarm notification, emergency communication and similar power-limited auxiliary functions may be run in the same conduit as initiating and signaling line circuits. All circuits shall be provided with transient suppression devices and the system shall be designed to permit simultaneous operation of all circuits without interference or loss of signals.
 - 5. Conduit shall not enter the fire alarm control panel or any other remotely mounted control panel equipment or back boxes, except where conduit entry is specified by the Life Safety Control Panel (LSCP) manufacturer.
 - 6. Connectors shall be compression type fittings to join EMT to a box or enclosure and to couple two ends of EMT conduit. Fittings shall be: Zinc plated, steel UL listed concrete tight, and threadless where connecting to conduit. Male hub threads -NPSM (American National Standard Pipe Straight Mechanical) where connecting to box or cabinet with steel locknuts.
- B. Wire:
 - 1. Wiring shall be in accordance with state and national codes (e.g., CEC Article 760) and as recommended by the manufacturer of the fire alarm system. Number and size of conductors shall be as recommended by the fire alarm system manufacturer, but not less than 18 AWG (1.02 mm) for Initiating Device Circuits

and Signaling Line Circuits, and 14 AWG (1.63 mm) for Notification Appliance Circuits.

2. All wire and cable shall be listed and/or approved by a recognized testing agency for use with a protective signaling system.
 3. Wire and cable shall be installed in conduit or metal surface raceway when in exposed spaces. Minimum size of conduit shall be 3/4" inch. Utilize Wiremold 700 series surface raceway (in lieu of conduit) for area where conduit cannot be installed concealed. Cable above accessible ceiling can be installed free air when using applicable cable. Support all free air cable every 48" with j-hooks.
 4. All field wiring (with exception of external communications Ethernet) shall be electrically supervised for open circuit and ground fault.
 5. The LSCP shall be capable of T-tapping NFPA Style 4 (Class B) Signaling Line Circuits (SLCs). Systems which do not allow or have restrictions in, for example, the number of T-taps, length of T-taps etc., is not acceptable.
- C. Terminal Boxes, Junction Boxes and Cabinets: All boxes and cabinets shall be UL listed for their use and purpose.
- D. The fire alarm control panel shall be connected to a separate dedicated branch circuit, maximum 20 amperes. This circuit shall be labeled at the main power distribution panel as FIRE ALARM. LSCP primary power wiring shall be 12 AWG. The control panel cabinet shall be grounded securely to either a cold water pipe or grounding rod. The control panel enclosure shall feature a quick removal chassis to facilitate rapid replacement of the LSCP electronics.

2.3 FIRE ALARM DEVICES

- A. Initiation: See Component Schedule in the Electrical Drawings for details
1. Monitor Module
 2. Heat Detector
 3. Smoke Detector
- B. Notification: See Component Schedule in the Electrical Drawings for details
1. Strobe
 2. Combination Speaker-Strobe
 3. Sync Module

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Contractor shall thoroughly examine Project site conditions for acceptance of cabinets and enclosures installation to verify conformance with Manufacturer and Specification tolerances. Do not commence with installation until all conditions are made satisfactory.

FIRE ALARM SYSTEM
SECTION 26 6116
3595001000

3.2 INSTALLATION

A. General:

1. The 120/208-volt, 3 wire, 60 cycles AC emergency power supply required to power the system. Connect to red colored circuit breaker(s) in panel board. Identify circuit as "Fire Alarm Circuit Control".

B. Wiring:

1. Individual input and output device addressability as well as remote sensitivity measurement, supervision and power shall all be performed on the same pair of wires. Wiring shall be Class B.
2. Each Class B initiating circuit shall consist of a two (2)-wire circuit. allowing a maximum of 20 T-taps and not requiring any end-of-line device for supervision. Each initiating circuit shall accommodate up to 75% of the manufacturers maximum addressable programmable initiating devices, to allow for future expansion.
3. Wiring for shielding certain conductors from others or routing in separate raceways, shall be as recommended by the Manufacturer's current requirements.
4. All wiring shall be installed in a continuous steel conduit or metal surface raceway when in exposed spaces. All conduit fittings shall be steel compression. Conduit shall be of the size recommended by the equipment Supplier with a minimum of 3/4" inch.
5. Wire color-coding shall remain the same throughout the system.
6. No wiring other than that directly associated with life safety/fire alarm detection, alarms, or auxiliary fire protection functions (no 120 VAC), shall be permitted in life safety/fire alarm conduits.
7. Make conduit and wiring connections to sprinkler flow switches, PIV's, sprinkler valve monitors, door hold-open/closure devices, smoke management fans, smoke dampers, elevator controller, emergency generator, etc.
8. All wiring shall be checked and tested to ensure that there are no grounds, opens or shorts.
9. All life safety/fire alarm junction boxes shall be color-coded and marked
10. Wire nut splices are not allowed.
11. Wires shall be numbered at each connection, termination, and junction point. Wire numbering tags shall be Brady Perma-Code, Westline or equal wire markers. Each group of wires shall be tagged with its destination at each panel, terminal box or junction box.
12. All wire used on the life safety/fire alarm and communication system shall have a minimum insulation rating of 105 degrees C. Bell wire or thermostat wire is not acceptable.

3.3 FIELD QUALITY CONTROL

A. Pre-functional testing: Visual and mechanical inspection

1. Inspect for physical damage, defects alignment and fit.

2. Perform mechanical operational tests in accordance with Manufacturer's instructions.
3. Compare nameplate information and connections to Contract Documents.
4. Check tightness of all control and power connections.
5. Check that all covers, barriers and doors are secure.
6. Visually check all sampling pipes to ensure that all joints, fittings, bends, sampling points, etc., comply with the Specification.
7. Check the air sampling system to ensure the following features are operational and programmed in accordance with the specification.
 - a. Alarm threshold levels
 - b. Pipes in use
 - c. Detector address
 - d. Clock and date
 - e. Time delays
 - f. Air flow fault thresholds
 - g. Display buttons operable
 - h. Check to ensure that all ancillary warning devices operate as specified.
 - i. Check interconnection with LSCP to ensure correct operation.

B. Pre-functional testing: Electrical tests

1. The system shall be completely tested prior to final acceptance testing. All points shall be tested from point of initiation to the final point or points of annunciation. All circuits shall be tested for continuity and ability to transmit the required signal correctly to the LSCP. Any problem due to wrong wire type, wire twist, impedance, mismatches, noise filtering or shielding shall be completely corrected during pretesting and prior to any final acceptance tests.
2. Testing shall include each and every device in the system. Coordinate with other trades as necessary for testing.
3. Tamper switches: Verify "trouble" signal is received and alarmed on closing of each valve.
4. Smoke detectors and duct smoke detectors: Test with actual or approved artificial smoke. Verify that reset does not occur when devices are cleared of smoke. Verify supervisory circuit function. Perform pressure differential test on all duct-mounted smoke detectors.
5. Intelligibility testing shall be per IEC 60849 and verified and tested by a third-party testing organization.
6. Central station notification: Verify that one set of conductors in the terminal cabinet becomes a short circuit on any "trouble" condition and that the other set becomes a short circuit on any "alarm" condition. Verify that the conductor groups are labeled properly.

C. Contractor shall replace at no costs to the Owner all devices which are found defective or do not operate within factory specified tolerances.

**FIRE ALARM SYSTEM
SECTION 26 6116
3595001000**

END OF SECTION

PART 1 - GENERAL REQUIREMENTS

1.1 OVERVIEW

- A. Copper cabling will be Panduit with a 25 year Pan-Net warranty.
 - 1. At project completion, the contractor shall present to owner a single project binder with electronic and hard copies of test results, as built drawings, pictures, bill of materials listing part numbers, etc. and a Visio 2007 drawing electronic provided to owner's Information Services and Educational Technology (ISET) office which identifies all Data jack locations and port assigned numbers.
- B. The installing contractor shall furnish and install all hardware, cables, devices, and other materials even though not specifically mentioned herein, which are necessary for the proper integration of the system so that the system shall perform the functions listed herein in compliance with all specified requirements.
- C. A Contractor may use up to ONE sub-contractor to install all CAT6 data cabling. Contractor will provide 'As Builts' and warranty information to ISET department.
 - 1. The contractor shall have a minimum of five years professional field experience pulling/terminating fiber and Cat6 cable.
 - 2. The contractor shall possess a valid C-7 California State contractor's license. This license shall have been issued two (2) years prior to the date of the bid. No other license classification is acceptable.
 - 3. The contractor and/or sub-contractors shall have Panduit Certified Installers as well as Corning Certified NPI Installers.
- D. The contractor and/or sub-contractors shall have at least half BICSI installers and one RCDD who will work on the project.
 - 1. The contractor shall provide a twenty-five (25) year application performance warranty for all Panduit Pan-Net copper cable and connectivity products. The system shall be installed to meet all TIA/EIA commercial building wiring standards and installed per appropriate Panduit instruction sheets. If any Panduit product fails to perform as stated above, Panduit will provide new components at no charge.

1.2 ABBREVIATIONS

- A. A.P. - Wireless Access Point
- B. AFF - Above the finished floor
- C. BKBRD - Backboard
- D. E.F. - Entrance Facility (formerly called MPOE or MPOP)

DATA COMMUNICATIONS
SECTION 27 1000
3595001000

- E. E.R. - Equipment Room. A building/campus serving facility connecting backbone to horizontal cabling and housing the building/campus' core system equipment.
- F. IDF – Intermediate Distribution Facility
- G. ISP - Inside Plant
- H. MAC - Moves, Adds, and Changes
- I. MDF – Main Distribution Facility
- J. MM - Multimode fiber
- K. NEXT - Near End Crosstalk
- L. OSP - Outside Plant
- M. SM - Single mode fiber
- N. T.R./T.E. - Telecommunications Room/Enclosure. A floor serving facility connecting backbone and E.R. to horizontal cabling in a region on each floor.
- O. TBB - Telecommunications Bonding Backbone
- P. TGB - Telecommunications Ground Buss Bar
- Q. TMGB - Telecommunications Main Ground Buss Bar
- R. U.O.N. - Unless otherwise noted

1.3 RELATED DOCUMENTS

- A. In addition to these specifications, the contractor shall reference the following drawings and documents:
 - 1. Architectural / Engineer drawings
 - 2. Detail Visio 2007 As Built Drawings and Diagrams.
 - 3. Any addendum, hereafter release of specifications
 - 4. Panduit Pan-Net 25 year Warranty
- B. Contractor shall ensure that, manufacture, ANSI/TIA/EIA-586-B cable testing, and install of the telecommunications cabling network is per manufacturer's requirements and in accordance with NFPA-70 (National Electrical Code®), state codes, local codes, requirements of authorities having jurisdiction, and particularly the following standards:
 - 1. ANSI/TIA/EIA-568-B.1 - Commercial Building Telecommunications Cabling Standard, Part 1: General Requirements
 - 2. ANSI/TIA/EIA-568-B.2 - Commercial Building Telecommunications Cabling Standard, Part 2: Balanced Twisted Pair Cabling Components
 - 3. ANSI/TIA/EIA-568-B.3 - Optical Fiber Cabling Components Standard

4. ANSI/TIA/EIA-569-A - Commercial Building Standard for Telecommunications Pathways and Spaces
 5. ANSI/TIA/EIA-606(A) - The Administration Standard for the Telecommunications Infrastructure of Commercial Buildings
 6. ANSI/TIA/EIA-607(A) - Commercial Building Grounding and Bonding Requirements for Telecommunications
 7. ANSI/TIA/EIA-758(A) Customer-Owned Outside Plant Telecommunications Cabling Standard
 8. ISO/IEC 11801:2002 ed 2- International standard for Class F (Cat7)
 9. IEC 61076-3-104:2002- International standard for RJ quad jack
 10. ISO/IEC CD14165-114 - International standard for duplex gigabit on two pair Ethernet
 11. TIA TSB 155 - 10G Ethernet over existing Cat6 up to 50 meters
 12. ANSI/TIA/EIA 565.B.2,10 - Standard for Cat6
 13. Cal/OSHA-Pocket Guide for the Construction Industry (recent edition)
- C. Contractor shall install cabling in accordance with the most recent edition of BICSI publications:
1. BICSI - Telecommunications Distribution Methods Manual (TDMM)
 2. BICSI - Cabling Installation Manual
 3. BICSI - Customer-Owned Outside Plant Design Manual
- D. Federal, state, and local codes, rules, regulations, and ordinances governing the work, are as fully part of the specifications as if herein repeated or hereto attached. If the contractor shall note items in the drawings or the specifications, construction of which would be code violations, promptly call them to the attention of the owner's representative in writing. Where the requirements of other sections of the specifications are more stringent than applicable codes, rules, regulations, and ordinances, the specifications shall apply.

1.4 PRE-INSTALLATION MEETING

- A. Schedule a meeting a minimum of five calendar days prior to beginning work.
- B. Agenda: Clarify questions related to work to be performed, scheduling, coordination, labeling for data jacks, data jack layout on telco racks in MDF and IDFs, etc.
- C. Attendance: Communications systems installer, general contractor, architects representatives, and other parties affected by work.
- D. A copy of manufacturer warranty application shall be provided at this meeting.

1.5 WARRANTY

- A. The project shall be pre-registered with manufacturer before installation has begun.
- B. The installation will have to pass scan tests by a certified contractor.

DATA COMMUNICATIONS
SECTION 27 1000
3595001000

- C. The installation will have to be documented with labels and drawings.
- D. A 25-year PAN-NET manufacturer warranty covering all components, equipment and workmanship shall be passed through in writing with system documentation. The warranty period shall begin on the system's first use by the owner.

1.6 APPROVED PARTS LIST

The following is an approved parts list:

Wire Management

Manufacturer	Part Number	Description
Panduit		J-Hooks shall be Panduit
Panduit	WMP1E	2U Horizontal Wire management
Panduit	WMPSE	1U Horizontal Wire Management
Panduit	CLT100F-C3	1" Split Loom Tubing Orange
Panduit	CLT188F-X3	1.88" Split Loom Tubing Orange
		1" Fiber Innerduct
		2" Fiber Innerduct
Panduit	CWF400N	4" Conduit Waterfalls
Panduit	CCMKIT1	Cable Management Kit
Panduit	WMPVHC45E	Vertical Cable Manager Front & Rear
Panduit	NCMH2	2U Horizontal Cable Manager Front & Rear
Trilobular		Taptite II thread

Twisted Pair Products

Manufacturer	Part Number	Description
Panduit	PUR6004BU-U	Cat 6 Riser Blue
Panduit	PUR6004WH-U	Cat 6 Riser White
Panduit	PUR6004OR-U	Cat 6 Riser Orange
Panduit	PUR6004RD-U	Cat 6 Riser Red
Panduit	PUR6004YL-U	Cat 6 Riser Yellow
Panduit	PUR6004VL-U	Cat 6 Riser Violet
Panduit	PUP6004BU-U	Cat6 Plenum Blue
Panduit	PUP6004WH-U	Cat6 Plenum White
Panduit	PUP6004OR-U	Cat6 Plenum Orange
Panduit	PUP6004RD-U	Cat6 Plenum Red
Panduit	PUP6004YL-U	Cat6 Plenum Yellow
Panduit	PUP6004VL-U	Cat6 Plenum Violet
General Cable	7136100	Outside Plant Cat 6
Panduit	CFPE1WHY	1 Port White Faceplate
Panduit	CFPE2WHY	2 Port White Faceplate
Panduit	CFPE4WHY	4 Port White Faceplate
Panduit	CFPE6WHY	6 Port White Faceplate
Panduit	CFP2SY	Stainless Steel 2 Port Faceplate
Panduit	CJ688TGWH	Cat 6 Jack White
Panduit	CJ688TGOR	Cat 6 Jack Orange
Panduit	CJ699TGYL	Cat 6 Jack Yellow
Panduit	CJ688TGBL	Cat 6 Jack Blue
Panduit	CJ688TGVV	Cat 6 Jack Violet
Panduit	CJ688TGRD	Cat 6 Jack Red

DATA COMMUNICATIONS
SECTION 27 1000
3595001000

Panduit	CPPL24WBLY	Blank, Minicom, 24 port patch panel
Panduit	CPPL48WBLY	Blank, Minicom, 48 Port Patch Panel
Panduit	SRBWCY	Strain Relief for Patch Panel
Panduit	PSL-DCJB	Black out Module Red (Need White, Red Listed)
Panduit	PSL-DCJB-IW	Black out Module White
Panduit	PSL-DCJB	Black out Module
Panduit	C4PPLK	Replacement Label Kit
Panduit	UTPSP3RD	3 Foot Cat 6 Red Patch Cord
Panduit	UTPSP5RD	5 Foot Cat 6 Red Patch Cord
Panduit	UTPSP3OR	3 Foot Cat 6 Orange Patch Cord
Panduit	UTPSP6OR	5 Foot Cat 6 Orange Patch Cord

Raceway

<u>Manufacturer</u>	<u>Part Number</u>	<u>Description</u>
Panduit	LD3WH6-A	LD3 Raceway (Substitute 6 with 8 and 10, for Longer Lengths)
Panduit	LD5WH6-A	LD5 Raceway (Substitute 6 with 8 and 10, for Longer Lengths)
Panduit	LD10WH6-A	LD10 Raceway (Substitute 6 with 8 and 10, for Longer Lengths)
Panduit	CFXWH-E	Raceway Coupler (Replace 'X' with 3, 5, or 10 for the different size raceway)
Panduit	RAFXWH-E	Right Angle Fitting (Replace 'X' with 3, 5, or 10 for the different size raceway)
Panduit	ICFXWH-E	Inside Corner Fitting (Replace 'X' with 3, 5, or 10 for the different size raceway)
Panduit	OCFXWH-E	Outside Corner Fitting (Replace 'X' with 3, 5, or 10 for the different size raceway)
Panduit	DCFXWH-E	Drop Ceiling Fitting (Replace 'X' with 3, 5, or 10 for the different size raceway)
Panduit	JBX3510WH-A	Single Gang Outlet for LD Raceway

Tools

<u>Manufacturer</u>	<u>Part Number</u>	<u>Description</u>
Panduit	CGJT	
Panduit	EGJT	
Panduit	CWST	
Panduit	CJAST	
Panduit	TTS-20R0	Tak Tape Rolls
Panduit	HLS-75R0	Bulk Velcro

DATA COMMUNICATIONS
SECTION 27 1000
3595001000

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. The acceptable manufacturer for the cabling connectivity is Panduit/General copper or Panduit/Panduit copper.
- B. Part listed are the owner's standards and any substitutions shall be approved in writing through submittal.
- C. Panduit 25 year Pan-Net.
- D. Corning Cable

2.2 QUANTITIES

- A. Distances mentioned and shown on drawings or spreadsheets are approximate. Field verification shall be made prior to install.
- B. Quantities listed here and in "parts list" document take precedence over drawing quantities.

2.3 SYSTEM COMPONENTS

- A. Materials provided shall meet or exceed the standards/description listed below.
- B. Fiber Trunk Cable
 - 1. Corning 12 strand single mode outdoor riser fiber optic cable
- C. Horizontal Cable (Cat6):
 - 1. Solid copper, 24 AWG, 100 balanced twisted-pair (UTP) Category 6 cables with four individually twisted-pairs, which meet or exceed the mechanical and transmission performance specifications in ANSI/TIA/EIA-568-B.2 to 250 MHz. General Cables Genspeed 6000 Enhanced CAT6E meets the specification.
 - 2. Use plenum rated cable in PLENUM air environments only.
 - 3. Use gel-filled or other outdoor plant cables in OSP environments as under slab concrete, outside near water, etc.
- D. Connectors (Cat6):
 - 1. 8-pin modular, category 6, pinned to T5689B standard.
- E. Faceplates:
 - 1. Provide 1, 2, 4 or 6 port faceplates and use classic style with label window. Fill unused ports with blank inserts.
- F. Patch Frames:

1. Data frame is to be 19" rack mountable, 24 or 48 empty ports for 8-pin modular jacks. Panels shall include a window for labels. Note: unused ports are to be filled in with black blank inserts.

G. Wire management:

1. On racks the horizontal cable managers shall be Panduit center mounting brackets (WMPF1E) for the wire managers in front for easy access during MACs. Horizontal managers shall be a minimum 1 RU.
2. Vertical cable managers (WMPVHC45E) are to be same height as rack. With fingers in the rear and in the front. They shall to have a bend radius control or strain relief clips. Panduit vertical managers are to be used for extra capacity.
3. Cable runway shall be ladder style or mesh /solid cable tray with a 12" width and 4" depth. The runway shall be mounted to a support loading wall as well as supported to the rack. An angle transition shall be used for adjoining runways or 90 degree bends. A cable drop shall be used to protect cables transitioning from runway to point of termination. If using a ladder style, use cable fingers attached to the sides to prevent spilling of cable over the sides.

H. Cable Pathways:

1. J-hooks will be used for suspending cables. These hooks shall have a 50 cable capacity and optional mounting. Preferred hooks have a wheel attachment capability so cables will not be dragged across during installation. Ensure that bends and edges will not pinch or cut cable sheath. Provide enough J-hooks to keep pathway along walls, J-hooks shall not cross the room.
2. Penetrations through fire rated walls shall utilize a metallic assembly with fire stop built into the assembly. EZ Path mechanical fire stop by Specified Technologies meets this requirement and shall be used. There is no exception to this.

I. Miscellaneous:

1. Cable ties shall be Velcro with a loop strap. Nylon cable ties shall not be used. If they are they shall be black and strapped with a loose tie so as not to pinch the cable sheath and with enough slack to get snips and fingers between tie and cable. The end of the tie shall be cut off after strapping.
2. Labels for patch panels, faceplates, and cables shall be by one manufacturer. Ex: Label Ware, EasyMark, Brady, LabelMo, etc.
3. All conduits shall have a maximum fill ratio of 60%.
4. All labels including the cable label shall be laser printed.
5. Labeling (Wire and Wall Jacks): All Labeling shall follow the "Tracy U.S.D. Labeling Format" (See "Tracy U.S.D. Labeling Format" Spreadsheet) with exception of workstation cables (i.e. patch cords). Hand written labels are not acceptable. All labels shall be machine printed black lettering on opaque white tape, stenciled onto adhesive labels, or type written onto adhesive labels. The font shall be at least one-eighth inch (1/8") in height, block characters, and legible. Patch panels shall be assembled and terminated in a sequential order, exhibiting room and workstation numbers for all workstations served by the MDF or IDF.

DATA COMMUNICATIONS
SECTION 27 1000
3595001000

6. Each fiber optics cable segment shall be labeled at each end with its respective IDF identifier. Each fiber interconnect device shall be labeled with its respective IDF identifier.
7. Each telecommunication outlet shall be labeled with its respective workstation number respective (machine labels only).
8. Workstation Terminal Outlets are to be installed within single-gang or double-gang electrical boxes. No mud-rings are to be used. WAO faceplates are to have labeling which identifies connected IDF.
9. Each copper backbone cable shall be machine labeled and printed EIA/TIA-606 Section 8 compliant only at each end with its respective IDF number/letter. Each binder group shall be tied off with its respective identifying ribbon at each breakout point.
10. Labeling will be completed before testing shall begin; discrepancies during inspection with the labeling will void all test results.

2.4 PROJECTOR

1. Contractor shall furnish and install Epson Brightlink 1485Fi and associated Epson Pilot control pad.

PART 3 - EXECUTION

3.1 SYSTEM SPECIFIC INSTRUCTIONS

A. Horizontal Cable:

1. Contractor shall label cables in 2 locations 12" apart.
2. Contractor is to terminate using the 568B pin out.
3. Contractor is to leave 10 feet of slack for all cables at the station in the accessible ceiling.
4. All cables will terminate at the stations with RJ45 connectors and shall be housed in a faceplate. If the connector is in the ceiling or behind a faceplate (such as the AV control panel) the connector shall be installed in a surface housing.

B. Closet/Rack:

1. All cables will terminate on the rack on a modular patch panel with an RJ45 connector.
2. A horizontal manager shall be installed above and below every 48 ports of patch panels (CPPL48WBLY) and switches.
3. A service coil shall be created above the rack on the wall of the closet. Do not place a service coil within the vertical and horizontal wire management. Cables within those managers shall be kept straight with proper bend radius.
4. The service coil shall be long enough to reach the farthest corner of the room and then down to the floor.
5. Patch frames shall be rack mounted using grounding screws and washers.

6. Note: unused ports on the patch frames are to be filled in with black blank inserts. Also, 1-2 blanks will be installed after each student data, teacher, admin, ceiling, and paging outlet with less than 4 cables to allow for future MACs.
7. Contractor shall place a drawing next to the data rack showing a floor plan with outlet locations and labels that match the rack labels. These drawings are to be laminated or in a plastic casing.

3.2 INSTALLATION PROCEDURES

- A. The following are installation practices that ensure superior performance and aesthetics.
- B. NOTE: References to conduit, raceway and electrical are for contractor's information. Actual installation of these components is included in another specification. If contractor notices a difference between actual install and the specs below, the contractor shall bring that immediately to the attention of the electrical engineer.
- C. Work Area Outlet
 1. The 10 ft coil shall not be a traditional service loop. Rather, the cable shall be extended along the wall then brought back at a lower height.
 2. A pull string for MACs shall be pulled with cable into accessible ceiling space or length of conduit. *Label strings to indicate destination of conduit.*
 3. Fill and label faceplates starting in the top left then moving right and downward.
 4. In addition to labeling, jacks shall be quickly identifiable by the following color:
 - a. Paging Jack Blue
 5. All jacks are to be terminated using 568B pin assignment.
 6. Minimize the amount of untwisting in a pair as a result of termination to connecting hardware. The amount of twisting shall not exceed 1/2" for category 6 and higher cables. Cable sheath shall touch the back of jack after termination (leave no portion of the cable exposed).
 7. A classic series faceplate (or surface mount box if needed) with a label window shall be used or the Jack itself labeled (Easy Mark #PLL-46-Y3C-1 or equal).
 8. The cable behind the faceplate shall also be labeled to match faceplate.
 9. ALL labels are to be machine generated, laminated, and adhesive.
 10. Each faceplate shall be labeled with its respective workstation number.
- D. Cable Pathways
 1. Acceptable Pathways:
 - a. All horizontal cable shall have support, the cable shall never be lain freely and resting on structural supports nor shall they use ceiling grid or lighting support wires.
 - b. The pathway to the work area shall allow for a minimum of 3 cable runs per individual work area.
 - c. Pathways shall ensure that a maximum pulling tension 25 lb-f is not exceeded and pathways (or installers) shall not deform the cable jacket. *If cable becomes kinked, contractor shall replace the cable.*

DATA COMMUNICATIONS
SECTION 27 1000
3595001000

- d. Acceptable pathways are: cable tray, j-hooks, conduit, and surface mount raceway. No floor mounted boxes.
- 2. J-hooks - responsibility of cable installer
 - a. Cables shall not be attached to ceiling grid or lighting support wires. Instead cable pathway shall be along walls. Cables shall never cross a room. The pathway shall always be along a wall. This makes for easier MAC as any tile next to a wall can be moved to access.
 - b. For large quantities of cables (50 to 75) that converge at the TR and other areas, provide cables trays that are specifically designed to support the required cable weight and volume. When more than 50 cables are in a pathway j-hooks shall not be used or a second pathway shall be created. (NOTE: It is recommended that no more than 25 UTP Cat6 cables be placed in a single J-hook).
 - c. If cable tray is used follow manufacturer guidelines for installation and use a product that is designed specifically for communications cabling. The depth of the tray shall not exceed 4".
 - d. When using J-hooks, locate them staggered between 4 ft to 5 ft to adequately support and distribute the cable's weight. Do not evenly space the hooks, vary between 4 to 5 feet between each hook to prevent signal disruption.
 - e. When using J-hooks install cable with a wheel pulley system that will remove after cable is in place.
 - f. Contractor shall not strap the cables in between hooks to enable easier MACs and to lessen possibility of alien crosstalk.
- 3. Conduit
 - a. When pulling through conduit, cable pulling lubricants shall be continuously applied to all cables and be specifically approved by the cable manufacturer.
 - b. Pull string shall be installed in conduit to allow future MACs. If more than one string is installed in a conduit, the strings shall be labeled for identification of destination.
 - c. Conduits shall have grommets on end to protect the cable.
 - d. No more than (2) 90 degree turns in a given length
- 4. Fill capacities
 - a. Cable pathways shall not be filled greater than the NEC maximum fill for the particular pathway type.
 - b. The fill cable capacity for conduit shall not exceed the following and be no more than 60% full:
 - 1) 1/2 " 0 – Do not use
 - 2) 3/4 " 0 – Do not use
 - 3) 1" 4 – Do not use
 - 4) 1 1/4 " 6
 - 5) 1 1/2" 8
 - 6) 2 " 12
 - 7) 2 1/2 " 16

- 8) 3 " 24
- c. Fill capacity for raceway: (See Manufacturer Specs and Size by Cat6 requirements or 8.4mm/.33in diameter cable)
- 5. Distance Limitations
 - a. Horizontal cable distance (Outlet to Panel) is not to exceed 298 feet.
 - b. Premise cable distance (Outlet to Panel) shall be no less than 55 ft for any cable installed. Coil excess in ceiling if physically closer than 55 ft.
- 6. Aerial cable shall not be utilized.
- E. Bend Radius Limits
 - 1. The minimum bend radius for copper cable 4x cable diameter which is approximately 1.24 inches (31 mm).
 - 2. The minimum bend radius for indoor (ISP) backbone optical fiber when under no load is 10 times the cable diameter and while it is being pulled it is 15 times.
- F. EMI Avoidance
 - 1. Cabling shall be installed to avoid devices that cause electromagnetic interference, such as Microwaves, Refrigerators, lighting, ballasts, power panels, etc.
 - 2. Keep a minimum of 6" from electrical conductor cable.
 - 3. Telecommunications conductors shall not be routed closer than 6 ft. from any lightning protection system conductor.
- G. Cabinets and Racks
 - 1. Only black Velcro cable ties shall be used for bundling and routing. Bundles shall be loose and Velcro ties shall have at least 18 inches between and the bundle shall be loose enough to place two fingers between the cable and the ties.
 - 2. The service coil at the rack shall be located above the rack on the ladder rack/cable tray system or on the wall. Do not place the service coil within the vertical and horizontal wire management.
 - 3. Entrances to cabinets shall be protected with grommets and shall have a conduit stubbed to ceiling space.
 - 4. Installer shall create a detailed floor drawing designating jack locations and labels. A copy shall be attached inside the cabinet or back wall of the rack. The drawing shall also have the date and contractors contact information.
 - 5. Installer shall ensure that every telco rack/cabinet shall have separate and individual patch panels for workstation data cabling for each classroom, office or room space. In-addition, separate and individual patch panels shall be installed for each individual system such as: Extron A/V, Valcom IP Paging, Security Surveillance, and Wireless Access Point devices.
- H. Wire Management
 - 1. When bringing cable into the data rack, keep the bundle size small (optimum size may be 12 cables no more than 24 cables).

DATA COMMUNICATIONS
SECTION 27 1000
3595001000

2. Velcro Ties shall be used in place of cable ties. Do not cinch cables so tightly to deform the cable in any way. It is recommended to leave Velcro ties loose enough to get fingers in between without deforming cable. Velcro ties shall be placed no less than 18 inches from other Velcro straps.
3. Every 48 ports of patch frame shall have its own wire manager below and above (except angled patch frames). The manager shall be d-rings on the front for easy access for MACs. Rear management shall also be used and may be finger style or bar style.
4. In addition to the horizontal managers, the installer shall either install a vertical (WMPVHC45E) Panduit center mounting brackets for the wire managers for vertical management.
5. In addition to binding in Velcro ties, ring runs shall be used for cables run in corners and for drop and rise on walls. These bundles shall be labeled indicating the destination of the bundle (i.e. floor horizontal cables, to TR2, etc.).
6. When cable bundles transition from wall to a floor rack a cable tray or ladder rack shall be utilized. Install brackets on sides to prevent cables from falling off the rack if ladder rack is used.

I. Fire stopping

1. All procedures in this category shall be done in accordance with authority having jurisdiction (AHJ), local codes, CEC, and insurance underwriter's requirements. If a procedure in one of these effects performance, the AHJ shall be alerted immediately in writing.
2. Ensure that materials used are U.L. Listed.
3. For sleeves through ALL walls, EZ Path by Specified Technologies shall be used to ensure a fire stopped pathway on future MAC.
4. Contractor shall put a label per ANSL11A/EIA 569 with warning to not remove, company name and phone number, and date next to each penetration. Contractor shall also place a label stating how many cables can fit within the EZ Path. If initial install fills the firestop, the label shall read "Capacity full — DO NOT ADD CABLES". Do this labeling and take a picture to include in close out docs. Cabling will not exceed 60% fill.
5. If the firestop capacity is filled more than 85% during initial install, contractor shall install an additional EZ Path.

J. Grounding and Bonding

1. All network equipment, shielded cables, patch panels, racks, and tray/ladder rack segments shall be Bonded and Grounded according to TJNEIA 607, BICSI guidelines, CEC, insurance underwriter's requirements, and local code (AHJ). The purpose is to provide a path to ground for all components to ensure personal safety and equipment protection.
2. Ensure that materials used are U.L. Listed.
3. Conduits that contain grounding backbone conductors shall be bonded to the grounding conductor at each end of the conduit. This negates the high impedance choke" effect while the cable carries lightning currents.
4. All racks, trays, and electronics shall be grounded.

5. Contractor shall install on rack an ESD Port Kit on each rack in front and back.
6. The use of aluminum conductors is discouraged in the establishment of grounding scenarios. Aluminum does not provide the lowest resistive path. Additionally, aluminum conductors can become loose from mechanical screw/bolt connections due to vibration from carrying AC current.
7. Panduit's Data Center Grounding Solution and components shall be used. The following components shall be used to form a complete system (see the detailed drawing): Cabinet Grounding Complete Kit, Common Bonding Network Jumper (CBN) Kit, Surge Suppressor Jumper Kit, Front to Back Rail Jumper Kit, Rack Ground Strip Kit, Grounding Bus bar Kit, Paint Piercing Grounding Washers Kit, Thread Forming Screws, and Electrostatic Discharge (ESD) Discharge Port Kit.
8. Contractor shall test the ground system to ensure it has less than 5 Ohms. The test results shall be documented and submitted in close out docs.
9. Documentation: Contractor shall provide a single set of documentation to include test results and Visio "As-built" drawings in both soft copy and hard copy format.
 - a. Workstation Cable: The results of the workstation cable tests shall be provided in the form of printouts from the test equipment as well as computer file copies on CD with the software to read the results included. Test results shall be in PDF format.
 - b. As-Built Drawings: Contractor shall produce drawings depicting data outlet locations as they are actually installed. The drawings shall indicate actual cable routing, work station locations and workstation numbers, to be submitted before final inspection for punch list. Incorrect Visio drawings are punch list items and are to be corrected before re-inspection. "Tracy Unified School District's Telecommunications Jack Legend" shall be applied to all drawings. Results shall be returned to ISET within 30 days.

3.3 TESTING

- A. Testing shall be done with a Fluke Level IV cable tester (DTX 1800 meets this specification) and an Optical Time-Domain Reflectometer (OTDR). The new Fluke DTX 1800 unit is one test set that is capable of testing all frequencies through 900 MHz. If another manufacturer provides this test, contractor shall submit spec sheets and receive written approval for the tester prior to testing.
- B. Contractor shall ensure that the tester has been manufacturer calibrated within nine months of testing and has the latest software version downloaded.
- C. Prior to testing, the tester shall be set for the specific cable and jack used on the project.
- D. A summary test report shall be submitted as well as detailed reports for each cable.
- E. All test results shall have the individual cable label and project name in the header along with the date and time of testing.
- F. Test results shall clearly indicate a Pass or Fail on the report. If a cable fails in one parameter the test is considered a Fail. Marginal Pass cables (indicated with an asterisk) are not acceptable and will be considered as a Fail.

DATA COMMUNICATIONS
SECTION 27 1000
3595001000

- G. Any cable damaged or exceeding recommended installation parameters during installation shall be replaced by the contractor prior to final acceptance at no cost to the Owner.
- H. Test reports shall show a pass result for network standards, continuity, length, cross-talk, attenuation, and ambient noise.
- I. No Splices will be accepted.
- J. An optical time domain reflectometer (OTDR) test will be required on the existing fiber pathways prior to the work commencing and on conclusion of the work. District IT will provide final acceptance of the OTDR test results and sufficiency.

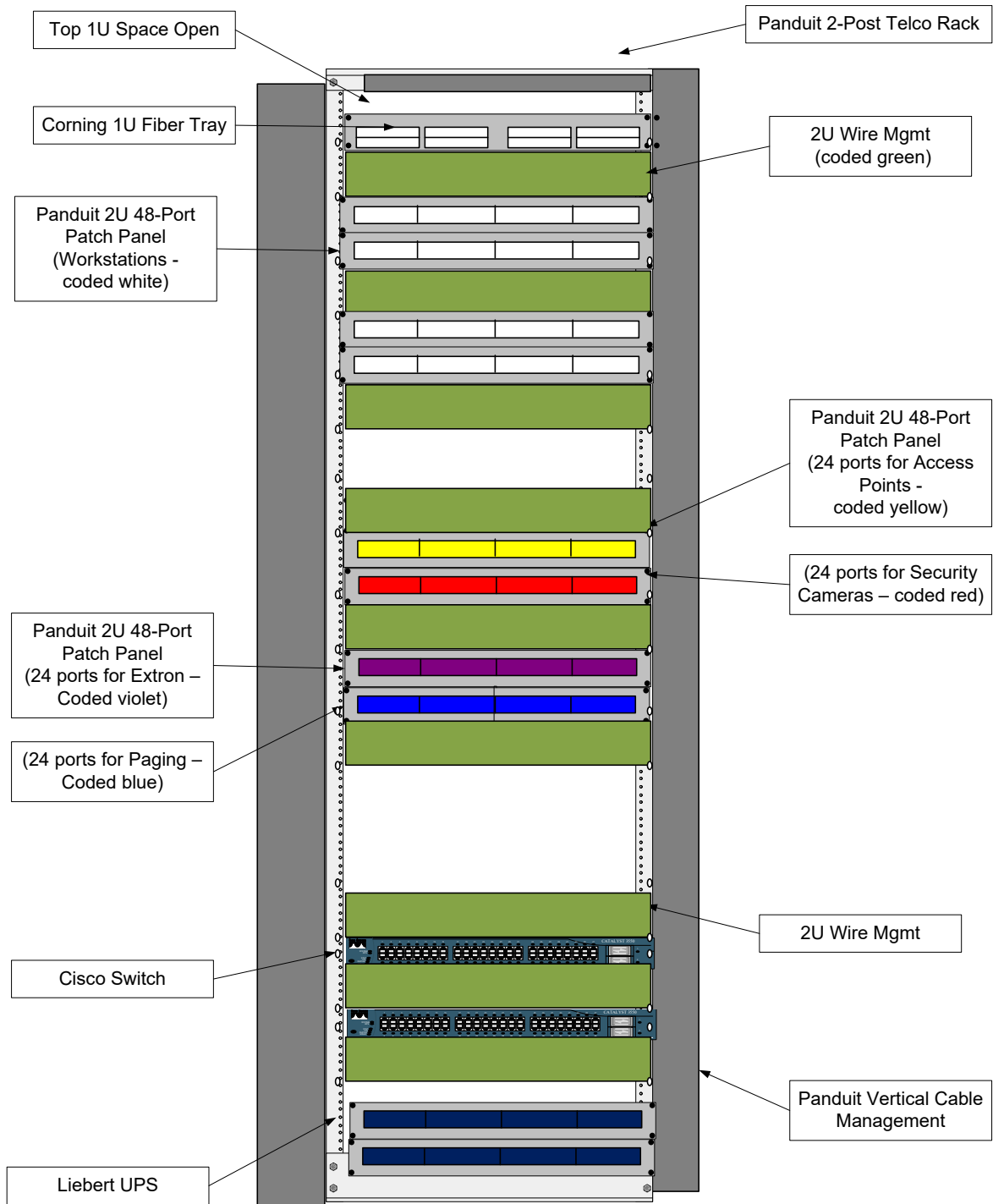
3.4 EXAMINATION /FIELD QUALITY CONTROL

- A. On a daily basis, the contractor's project manager shall inspect the installation to ensure that installers are following the specifications and quality craftsmanship.
- B. Throughout the project regular interval inspections will be completed by an architect representative to eliminate "unchangeable" installations.
- C. If the representative inspects the site and makes a change to the design or installation, this shall be noted in writing. The contractor shall not complete this change until approval is given.
- D. After installation, the architect representative will first inspect the site and create a closeout punch list for contractor to complete.
- E. After completion, the representative and contractor will inspect the site together.

3.5 IDENTIFICATION

- A. The labels are to be laser printed onto adhesive labels using software and labels by Label Ware, Easy Mark, Brady, LabelMo, etc.
- B. Each cable is to be labeled using the following pattern: XXX-A##
 - 1. Segment XXX: Designates the location where the other end of the cable is. That is, at the station it says what room the patch panel is, and at the patch panel it says what room the station is.
 - 2. Segment A: Designates which patch panel the cable is terminated. This allows 26 patch panels per closet.
 - 3. Segment ##: Designates which port on the patch panel the cable is terminated.
- C. Segment A and ## shall be the same on both sides of the cable.
- D. Contractor is to place labels onto the faceplates and panels. In addition, contractor shall place an adhesive label on each end of the cable.
- E. Layout of an IDF rack (*not to scale*). Rack height shall be 72".

**DATA COMMUNICATIONS
SECTION 27 1000
3595001000**



F. Labeling Format

1. All data cables at both the patch panel and the data jacks shall be labeled using the following standard labeling format. The labels are to be laser printed onto

DATA COMMUNICATIONS
SECTION 27 1000
3595001000

adhesive labels using software and labels by Label Ware, Easy Mark, Brady, LabelMo, etc.

2. Telecommunication outlets for a Valcom IP Paging horn, speaker or clock/speaker shall be labeled with its respective Valcom IP device number (machine labels only). Valcom numbers shall be comprised of the room number (i.e. C1, C2, etc.) and Valcom IP device number/drop number (i.e. PA1, PA2, etc.). Each data cable at a telecommunications outlet shall have an alpha identifier for the data jack (i.e. A). No biscuit shall be used and the data jack should be placed inside the Valcom back box. The labeling will start from the main door entering the room and go clockwise around the room. Each workstation cable shall be neatly labeled at each end with its respective workstation number.
3. Labeling for the respective port on the MDF/IDF patch panel shall be:
 - a. C1 – PA1 – A

3.6 CLEANING

- A. All work shall be cleaned to remove all dust, dirt, grease, paint or other marks. All electrical equipment shall be left in a clean condition inside and out, satisfactory to the owner. Keep buildings and premises free from accumulated waste materials, rubbish and debris resulting from work herein, and upon completion of said work, remove tools, appliances, surplus materials, waste materials, rubbish debris, and accessory items used in or resulting from work and legally disposed of offsite. For lead and asbestos dust removal, refer to "Safe School Standards" documentation.

3.7 CLOSEOUT

- A. The contractor will submit to owner within thirty days of completion a closeout package containing:
 1. Hard copy and electronic test results.
 2. Hard copy and electronic as-built drawings with labels (with extra copies to be posted in the E.R. and T.E.s).
 3. Warranty information and manuals.
 4. A bill of materials with part numbers to be used for later MAC.
 5. Hard copy and electronic pictures.
- B. As prerequisite to final acceptance, supply to the owner certificates of inspection from IOR and owner designated RCDD.

- END OF SECTION -

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. Furnish and install new analog devices into existing Analog Sound/Communications System and Analog Clock System, including all wiring and connections and other materials as shown on Plans and specified herein. It is the intent that complete operating systems be installed and that any power supplies, transformers, modules, cards, cages, programming, or other items required to achieve this end result shall be furnished whether or not such item or items are specified herein.
- B. School Application analog equipment supplied by Rauland-Borg, Inc. shall be considered as meeting all specification requirements.
- C. The system shall provide distribution of intercom, overhead paging, emergency paging, class change time tones and emergency tones.
- D. System shall be UL 813 and FCC Part 15 listed for safety reasons. Systems not listed are not acceptable.
- E. Site and System Investigation: Sound/Communications System bidder shall visit site prior to bid and become thoroughly knowledgeable about existing system and work required to perform work of this section. Failure to discover the equipment, materials, and labor required to complete the extensions will not relieve the contractor from completing the work at no additional cost. Existing system is Rauland ICS legacy system, and all devices shall integrate with existing system.

1.2 GENERAL REQUIREMENTS

- A. System Requirements: All of various equipment components to be complete with all appurtenant accessories required to provide specified facilities and perform specified functions throughout presently planned construction and space; and provisions for expanding system to provide same facilities, and perform same functions in all future planned construction, including space and mountings in consoles and terminal backboards.
- B. Equipment Tests and Standards:
 - 1. For all equipment operating at 26 volts or more, or utilizing over 50 watts, Contractor to submit proof within time allowed for submittals that all items of equipment will conform to requirements of U.L. Label or listing of equipment by U.L. to be accepted as evidence of conformance.
 - 2. For all items of equipment operating at 25 volts or less, and utilizing less than 50 watts, Contractor may submit, in lieu of such label or listing, written certificate from any nationally recognized testing agency, adequately equipped and competent to perform such services, that each item has been tested and conforms to U.L. standards, including method of test of U.L.
- C. Instructions and Manuals:

SOUND AND COMMUNICATIONS

SECTION 27 5123

3595001000

1. Equipment supplier of systems to demonstrate operation of systems to satisfaction of Owner and furnish Owner three (3) wiring schematics for all items of equipment, installation instructions, and details of all routine maintenance and servicing which must be given systems by Owner. Manuals shall be provided in 3-ring binders, with title page, list of contents, and conspicuous label on cover and shall be delivered to District. Submit copy to Architect for approval before delivering to Owner.
2. Supplier shall demonstrate operation of systems and provide training to all end users, administrative staff, and system administrator. Coordinate times of instruction with District, at District's convenience. Supplier shall provide a minimum of 2 hours of user instructions to clerical staff and 4 hours of user/maintenance instructions to District maintenance personnel. Instruction periods shall not coincide and shall be scheduled with District, not school staff. District shall provide list of authorized personnel for training sessions.

D. Submittals:

1. Refer to Section 27 1000.
2. Contractor shall submit name of firms he proposes to do work under this Section, addresses, phone numbers, and name of firm's contact, for approval. Such firms shall be factory authorized representatives of the existing system and submittal shall include manufacturer's letter of confirmation. Proposed firm shall furnish all equipment and specialty cables, make all connections to same, and place the systems in operation. Such firms shall have offices and service departments within a 100 mile radius of project and shall have been in business of this type for at least five years.

E. Record Drawings:

1. Final Inspection will not be made until drawings are received and approved. Record Drawings shall include "As-Built" one-line and wiring diagrams, with terminations identified, wire color coding schedule, pullbox locations, and conduit routing plans.
2. The Contractor shall provide complete drawings detailing all interconnections and panel wiring diagrams in Visio 2000 format.

F. Guarantee:

1. One firm to assume full responsibility for performance on all work of this section. Guarantee all equipment against defects in material and workmanship for two (2) years, and provide on-the-premises service during normal working hours for two years, at no cost to Owner if trouble is not caused by misuse, abuse, or accident, or at current labor rates if so caused. Provide manufacturer's written one-year guarantee for equipment and parts to Owner.
2. Service shall normally be available within 24 hours from service department of authorized distributor of manufacturer by factory trained servicemen.
3. On-the-premises service at other than normal working hours to also be available, but labor charges for such calls to be paid by Owner at current labor rates.

PART 2 - DETAIL REQUIREMENTS AND PRODUCTS

2.1 SOUND/COMMUNICATIONS SYSTEM

- A. General: Install new analog devices into existing Analog Intercommunications System.
- B. Verify existing server is provided and programmed.
- C. Equipment Standards:
 - 1. All enclosures for all equipment to be of metal throughout system. Enclosures other than metal are not acceptable.
 - 2. Speaker grilles to be non-directional diffusion type insulated from speaker by fiber mounting board. Dampening material to be installed between mounting board and grille to prevent metallic resonance.

2.2 SYSTEM CABLING

- 1. Each clock and speaker shall be wired to signal terminal cabinet located nearest to new building, and integrated into existing clock and speaker communication systems.
- 2. Exterior speakers: one 20 AWG shielded twisted pair
- 3. Interior speakers: one 18 AWG shielded twisted pair
- 4. Clock: 2-wire, 12 AWG unshielded

2.3 REMOTE EQUIPMENT

- 1. Existing system: Rauland ICS legacy system. Provide compatible equipment. All of various equipment components to be complete with all appurtenant accessories required to provide specified facilities and perform specified functions throughout presently planned construction and space; and provisions for expanding system to provide same facilities, and perform same functions in all future planned construction, including space and mountings in consoles and terminal backboards.
 - a. Outdoor Speakers: Provide surface mount backbox and vandal resistant enclosure
 - b. Interior Speakers: Provide square faceplate and recess mount backbox.
 - c. Clock: Provide 12", analog clock and recess mount backbox. Coordinate if existing spare clocks can be provided by the district.

PART 3 - EXECUTION

3.1 INSTALLATION REQUIREMENTS

- A. Electrical Contractor shall retain the services of the duly appointed representative as specified hereinbefore, who shall furnish all equipment, make all connections to same, and place system in operation. Technician and workman employed shall be particularly

SOUND AND COMMUNICATIONS
SECTION 27 5123
3595001000

skilled in this type of work. Workmanship on installed systems shall be of professional quality, best commercial practice.

- B. All wiring throughout entire system shall be installed in conformance with standard industry practice.
- C. Station locations shall be identified by location and school's actual room numbers as furnished by District, and in all ways shall relate as closely as possible to record wiring drawings. Prior to performing final labeling and programming, coordinate information with District.

3.2 CONSTRUCTION MEETINGS

- A. The Contractor shall schedule construction meetings at the jobsite as follows:
 - 1. Prewire meeting shall occur after raceways are installed and prior to pulling of any wire or cable.
 - 2. Pre-termination meeting shall occur after wire and cable has been installed and prior to termination.
- B. Meetings shall be scheduled by the Contractor on a building by building basis and shall include the Project Inspector, School's Representative, the electrical subcontractor, and the Signal System subcontractor as a minimum.

3.3 TESTS

- A. After all equipment specified herein has been installed and is in operating condition, performance tests shall be conducted to determine that installation and components comply with these specifications. Contractor shall furnish competent personnel for these tests.
- B. Perform initial programming of system and audio level adjustments.
- C. Contractor shall physically walk to each speaker and ensure that sound is coming from each speaker.
- D. Contractor shall set the volume level to approximately 6 dB above ambient noise during occupancy.
- E. The sound level for each speaker and zone shall be tested with an audio meter.
- F. Contractor shall provide a drawing showing dB levels for each speaker and zone. The drawing shall be dated and signed by the person administering the test.
- G. Contractor shall test the extension for each room. Extension also be noted on the drawings.
- H. Testing shall be scheduled with the Owner and shall occur after receipt by Architect of Contractor's written certification of completion, record one-line diagram, wiring diagrams, maintenance and operation manuals, and other "As-Built" data required by these specifications. Tests shall be scheduled with School before occupancy occurs.

- END OF SECTION -

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. Furnish and install extensions to the existing Intrusion Alarm System including all wiring and connections and other materials as shown on Plans and specified herein. It is the intent that a complete operating system be installed and that any power supplies, relays, resistors, cards, modules, programming, or other items required to achieve this end result shall be furnished whether or not such item or items are specified herein.
- B. Site and System Investigation: System bidder shall visit site prior to bid and become thoroughly knowledgeable about existing system and work required to perform work of this section. Failure to discover the equipment, materials, and labor required to complete the extensions will not relieve the contractor from completing the work at no additional cost.
- C. Proprietary Systems: Where school is protected and monitored by a proprietary system, such as ADT or Sonitrol, Contractor shall coordinate the exact requirements with those firms. If the Division 16 Contractor elects to use a sound and signal firm other than the proprietary company, the sound and signal firm must include in bid, the materials, equipment, and labor required by the proprietary company to make the extensions complete and fully functional.

1.2 GENERAL REQUIREMENTS

- A. System Requirements: All of various equipment components to be complete with all appurtenant accessories required to provide specified facilities and perform specified functions throughout presently planned construction and space; and provisions for expanding system to provide same facilities, and perform same functions in all future planned construction, including space and mountings in control panels and terminal backboards.
- B. Interruption of Service: Existing intrusion alarm system must be kept operational during unoccupied hours. In the event that the system or portion of system is nonoperational during off-hour periods as a result of work of this contract, the Contractor must provide guard(s) to patrol the campus. Guard(s) and guard duties proposed by Contractor must be acceptable to District and District Police (local enforcement if District does not have its own Police Services). All costs for security guard(s) shall be Contractor's responsibility.

1.3 QUALITY ASSURANCE

- A. Work shall be performed in accordance with all applicable requirements of the edition indicated on the drawings of all governing codes, rules and regulations including but not limited to the following minimum standards, whether statutory or not:
 - 1. California Electric Code (CEC)
 - 2. California Fire Code (CFC)
 - 3. National Fire Alarm Code with California Amendments (NFPA 72)

INTRUSION ALARM SYSTEM
SECTION 28 3100
3595001000

4. Title 3 of the Americans with Disabilities Act
5. Titles 19 and 24 of the California Code of Regulations

1.4 CONTRACTOR QUALIFICATIONS

- A. Fabricator/Installer/Vendor shall be licensed contractor and servicing agent, as well as installer for all components and systems in this System, and be acceptable to manufacturer of the major components of the system. Service personnel shall be capable of serving any and/or all components of the System.
- B. Fabricator/Installer/Vendor must be able to present evidence of technical expertise, be a firm who has successfully installed projects of a similar scope to this project for a minimum of five (5) years, and shall maintain service office within 100 miles of the project site.
- C. All equipment is to be manufactured by a firm/firms who have successfully fabricated elements/systems of a scope similar to this project for a minimum of ten (10) years.
- D. Have a valid State of California Contractor's license in classification C10 - Electrical.
- E. Provide authorized dealer service on-site at facility within four (4) hours of a problem being reported, with this response time available twenty-four (24) hours per day, seven (7) days per week.
- F. Affirm that he maintains, or will maintain, or has access to, a stock of system spares sufficient to ensure that no element of the System will be out of service for more than twenty-four (24) hours due to lack of proper spares.

1.5 SUBMITTALS, O&M'S AND RECORD DRAWINGS

- A. Submittals:
 1. Contractor shall submit name of firm he proposes to do work under this Section, addresses, phone numbers, and name of firm's contact, for approval. Such firms shall be factory authorized representatives of the system and submittal shall include manufacturer's letter of confirmation. Proposed firm shall furnish all equipment and specialty cables, make all connections to same, and place the systems in operation. Such firms shall have offices and service departments within a 100 mile radius of project and shall have been in business of this type for at least five years.
 2. Submittals shall be complete and include catalog data, shop drawings, one-line diagrams, battery calculations, voltage drop calculations, and scaled plan drawings. Building plans shall be 1/8"=1'-0", and site plans shall be no smaller than 1"=40'.
 3. Shop Drawings shall contain complete wiring and schematic diagrams for equipment furnished, equipment layout, conduit and wiring layout drawings, and any other details required to demonstrate that system has been coordinated and will properly function as a unit. Equipment Vendor shall check Drawings for adequacy of conductors and raceways for proposed system. Include in Bid

Amount all required raceways, conductors and material necessary to suit proposed system.

B. Operation and Maintenance Manuals:

1. Operating Instruction Manuals outlining the step-by-step procedures required for system start-up and operations shall be furnished. The instructions shall include manufacturer's name, model number, service manual parts list, and brief description of all equipment and their basic operating features.
2. Maintenance Instruction Manuals outlining maintenance procedures shall be furnished. The manual shall include a troubleshooting guide listing possible breakdowns and repairs and a simplified connection wiring diagram for the system as installed.

C. Record Drawings: Final Inspection will not be made until drawings are received and approved. Record Drawings shall include "As-Built" one-line and wiring diagrams, with terminations identified, wire color coding schedule, pullbox locations, and conduit routing plans.

D. Furnish to District a printed copy of the control panel programming upon completion of final system programming.

E. Performance Test Reports: Upon completion of installed system, submit in booklet form all field tests performed to prove compliance with the specified performance criteria. Each test report shall indicate the final position of controls.

1.6 TRAINING

- A.** Supplier shall demonstrate operation of systems and provide training to all end users, administrative staff, and system administrator. Coordinate times of instruction with District, at District's convenience. Supplier shall provide a minimum of 1 hour of user instructions to clerical staff and 2 hours of user/maintenance instructions to District maintenance personnel. Instruction periods shall not coincide and shall be scheduled with District, not school staff. Deliver to Owner at time of demonstration, all settings and codes programmed into system. Furnish three copies on manufacturer's standard programming worksheets. District shall provide list of authorized personnel for training sessions.

1.7 GUARANTEE

- A.** One firm to assume full responsibility for performance on all work of this section. Guarantee all equipment against defects in material and workmanship for two (2) years, and provide on-the-premises service during normal working hours for two years, at no cost to Owner if trouble is not caused by misuse, abuse, or accident, or at current labor rates if so caused. Provide manufacturer's written one-year guarantee for equipment and parts.
- B.** Service shall normally be available within 24 hours from service department of authorized distributor of manufacturer by factory trained servicemen.

INTRUSION ALARM SYSTEM
SECTION 28 3100
3595001000

- C. On-the-premises service at other than normal working hours to also be available, but labor charges for such calls to be paid by Owner at current labor rates.

PART 2 - DETAIL REQUIREMENTS AND PRODUCTS

2.1 SYSTEM OPERATION

- A. Activation of an intrusion alarm sensor shall cause a signal to be transmitted to a Central Station via telephone lines. Signal transmission shall be initiated by a built-in dialer unit. In addition to alarm reporting, system shall report trouble, low battery, and shunted zone indications.

2.2 SYSTEM DESCRIPTION

- A. Intrusion Detection Control Panels: Basis-of-design is the Honeywell VISTA 128BPT System, a burglary/access control/CCTV switching system that includes the following capabilities:
 - 1. Listed for UL Commercial Burglary.
 - 2. Supports up to 128 zones.
 - 3. Supports up to 8 separate partitions.
 - 4. Supports up to 150 users.
 - 5. Supports commercial wireless devices.
 - 6. Provides integrated security, access control, and CCTV switching capability.
 - 7. Provides supervision of peripheral devices.
 - 8. Supports long-range radio (LRR) communication.
 - 9. Provides scheduling capability to allow for automated operations.
 - 10. Supports alarm reporting via Internet.
 - 11. Interfaces with automation software.
 - 12. Monitors smoke detector maintenance signals
 - 13. Capable of being installed using existing wiring

2.3 MANUFACTURER

- A. Intrusion Detection Alarm Panel Manufacturer: System VISTA 128BPT by Honeywell, www.security.honeywell.com.

2.4 SYSTEM PERFORMANCE

- A. Control Panel: Existing control panel shall be verified by contractor to be an 8-partition, UL commercial and burglary control panel that supports up to 128 zones using basic hardwired, polling loop, and wireless zones, RF receivers, and relay modules. The control shall provide the ability to schedule time-driven events, and allow certain operations to be automated by pressing a single button. The system shall be capable of interfacing with an ECP long range radio (LRR) unit that can send Contact ID messages. The control shall provide integrated access control and CCTV-switching capability with the use of a single downloader and database.
1. Basic Hardwired Zones: Control shall provide 8 style-B hardwire zones.
 2. Optional Expansion Zones:
 - a. Polling Loop Expansion: Control shall support up to 120 additional hardwire zones using a built-in two-wire polling (multiplex) loop interface. The polling loop shall provide power and data to remote point modules, and constantly monitor the status of all zones on the loop. Maximum current draw shall not exceed 128 mA.
 - b. Wireless Expansion Zone: Control shall support up to 128 wireless zones using a 5800 series RF receiver (fewer if using hardwire and/or polling loop zones).
 3. Partitions: Control shall provide the ability to operate 8 separate areas, each functioning as if it had its own control.
 4. User Codes: Control shall accommodate 150 user codes, all of which can operate any or all partitions.
 5. Peripheral Devices: Control shall support up to 30 addressable ECP devices, which can be any combination of keypads, RF receivers, relay modules, and interactive phone module.
 6. Keypad/Annunciator: Control shall accommodate up to 16 keypads or six (6) touchscreen (i.e.; advanced user interface) keypads.
 7. Optional Output Relays: A total of 96 relay outputs shall be accommodated using relay modules. Each relay module shall provide four (4) Form C (normally open and normally closed) relays for general-purpose use.

INTRUSION ALARM SYSTEM
SECTION 28 3100
3595001000

8. Optional Vista Interactive Phone Module: The control shall support the ADEMCO 4285/4286 VIP Modules, which permit access to the security system.
9. Integrated Access Control
10. CCTV Switching: System shall be capable of supporting the VistaView 100 CCTV Switching System. The CCTV system shall be fully integrated and be event driven by Burglary or Access events. When cameras are not event driven, they shall be driven by an automatic preset dwell time.
11. Commercial Wireless Equipment: Control shall be compatible with UL Listed Commercial Wireless Security equipment.
12. Optional Keyswitch: Control shall support the ADEMCO 4146 Keyswitch on any one of the system's 8 partitions. If used, zone 7 is no longer available as a protection zone.
13. Voltage Triggers: System shall provide voltage triggers, which change state for different conditions. Used with devices such as a remote keypad sounder or keyswitch ARMED and READY LEDs.
14. Event Log: System shall maintain a log of different event types (enabled in programming). The event log shall provide the following characteristics:
 - a. Stores up to 512 events.
 - b. Viewable at the keypad or through the use of Compass software.
 - c. Printable on a serial printer, including zone alpha descriptors.
15. Scheduling: Provides the following scheduling capabilities:
 - a. Open/close schedules (for control of arming/disarming and reporting).
 - b. Holiday schedules (allows different time windows for open/close schedules).
 - c. Timed events (for activation of relays, auto-bypassing and un-bypassing, autoarming and disarming, etc.).
 - d. Access schedules (for limiting system access to users by time).
 - e. End User Output Programming Mode (provides 20 timers for relay control).
 - f. The system shall automatically adjust for daylight savings time.
16. Communication Features: Supports the following formats and features for the primary and secondary central station receivers:
 - a. Formats: ADEMCO Express; ADEMCO Contact ID 4 and 10 Digit Acct number.
 - b. Backup reporting: The system shall support backup reporting via the following: Secondary phone number; ECP long-range radio (LRR)

- interface; option to select long range radio (LRR) or dialup as the primary reporting method (dynamic signaling feature).
- c. Internet reporting: The system shall be capable of communicating with the central station via the internet using Alarmnet-i. It shall provide the user with the ability to control the system via a browser interface. All packet data transmitted to the monitoring station shall be encrypted with a minimum of 1024 bits of encryption.
- 17. Audio Alarm Verification Option: Provides a programmable Audio Alarm Verification (AAV) option that can be used in conjunction with an output relay to permit voice dialog between an operator at the central station and a person at the premises.
 - 18. Cross-Zoning Capability: Helps prevent false alarms by preventing a zone from going into alarm unless its cross-zone is also faulted within 5 minutes.
 - 19. Exit Error False Alarm Prevention Feature: System shall be capable of differentiating between an actual alarm and an alarm caused by leaving an entry/exit door open.
 - 20. Built-in User's Manual and Descriptor Review: For end-user convenience, the control panel shall contain a built-in User's Manual.
 - 21. Programming: Control shall be capable of being programmed locally or remotely using the ADEMCO Compass Downloader.

2.5 COMPONENTS

- A. Equipment and accessories furnished under the terms of these specifications shall be the standard products of the manufacturers specified or required. All equipment shall be listed by U.L. All equipment and accessories shall be compatible with the system.
 - B. System Integration: System shall integrate with facility doors, windows, and departments. The system shall also integrate with external systems, such as building appliances and building alert systems for remote control and central collection of external system alerts. When integrated with external systems, the system shall connect to the external system to receive status changes by way of a dry contact output from the external system. The system shall use its user interface to provide local status messages from external systems, providing for the initiation of local building policies. Optionally, the system may transmit information to an off-site monitoring service to provide initiation of remote policies when appropriate. The installer shall follow manufacturer's instructions when installing and programming system equipment.
- 1. V-Plex Bus Extensions: Extended system V-Plex bus branch circuits shall be scalable to increase the total size of the bus in larger installations. Branch circuits leading from different buildings or from different floors in multi-story buildings

INTRUSION ALARM SYSTEM
SECTION 28 3100
3595001000

shall be isolated from one another so that a shorted or grounded branch circuit is isolated away from other near-side branch circuits, allowing other V-Plex devices to be isolated so that they can continue to operate.

2. Zone Input: System zone inputs allow the system to sense the change in state of an output from an external device, such as a door/window position sensor, a motion detector, a relay output from an appliance, the output of an external alert system, or other devices that provide a dry closure output.
3. Combined AlarmNet-I (Internet) and AlarmNet-GSM (Global System for Mobile) Fire Alarm Communication: The facility system shall be monitored using both the AlarmNet-I and the AlarmNet-G Communication services. The system shall use Honeywell's AlarmNet IGSMCF Fire Alarm transmitter or equivalent. The communication service shall employ a two-way Internet connection through AlarmNet Communication Service as the primary method of communication, and then the two-way GPRS (General Packet Radio Service) as the secondary means of communication and shall use SMS (Short Message Service) as a tertiary means of communication. The equipment shall be UL listed for use in this application. The installer shall follow manufacturer's instructions when installing the AlarmNet unit.
4. VSI Bus Isolation and Integrity: System V-Plex bus branch circuits shall be isolated from one another so that a shorted, overloaded, or grounded branch circuit is isolated away from other near-side branch circuits, allowing undamaged V-Plex bus circuits to continue to operate. VSI Isolation modules shall be installed at near-side connections to cable runs leading to additional buildings, at cable runs leading to additional floors in multi-story buildings, and at junction boxes leading to multiple VPlex branch circuits within the system. The installer shall use the Honeywell VSI module or equivalent.
5. Zone Input: System zone inputs allow the system to sense the change in state of an output from an external device, such as a door/window position sensor, a motion detector, a relay output from an appliance, the output of an external alert system, or other devices that provide a dry closure output.
6. Door Contact: V-Plex: Honeywell Model 4939SN surface mount sensor.
7. Motion Detector, Wall-Mounted, V-Plex: Honeywell Model DT7500SN V-Plex Dual-Tec Motion Detector.
8. End of line resistors, as required.
9. Power Supplies: Altronics SMP Series with output voltage and capacity as required. Provide with appropriate transformer, enclosure(s), and battery(s). Battery(s) shall be sized to provide 24 hours of backup power. Provide power supplies as necessary.
10. RJ-31X mounted on Main Telephone Terminal Backboard.

- C. Wiring: The contractor shall provide cables consistent with the manufacturer's recommendations. The following general guidelines shall be followed for wiring installation:
1. Wiring shall be appropriately color-coded with permanent wire markers. Copper conductors shall be used.
 2. All signal cables provided under this contract shall be Class II, plenum-rated cable where required. Where subject to mechanical damage, wiring shall be enclosed in metal conduits or surface metallic raceway.
 3. Data wires shall not be enclosed in conduit or raceways containing AC power wires.
 4. Where EMI may interfere with the proper operation of the DACS circuits, twisted/shielded cable shall be used.

PART 3 - EXECUTION

3.1 INSTALLATION REQUIREMENTS

- A. Work shall be installed as shown on the Drawings in accordance with the manufacturer's diagrams and recommendations, except where otherwise indicated.
- B. Electrical Contractor shall retain the services of the duly appointed representative as specified hereinbefore, who shall furnish all equipment, make all connections to same, and place system in operation. Technician and workman employed shall be particularly skilled in this type of work.
- C. At existing sites, the existing system shall be tested as soon as possible after award of contract and prior to preparing submittals. Contractor shall test entire system to ensure proper operation. Any defects or deficiencies found shall be listed and presented to Owner in letter form. It will be assumed that existing equipment is fully functional unless identified otherwise by Contractor.
- D. Control panel shall be mounted with sufficient clearance for observation and testing.
- E. All junction boxes must be clearly marked for distinct identification.
- F. Panel enclosures shall comply with the Requirements of UL 864. Enclosures having doors over forty-eight inches (48") in height shall be provided with a three (3) point catch and lock; all other doors shall contain a cabinet type cylinder lock. Inserts shall be blind fastened so that no screws show on panel front.
- G. Detectors shall be installed in accordance with manufacturer's written instructions in areas as indicated on the Drawings.
- H. Circuits shall be terminated on screw terminals. Terminal blocks shall be Allen-Bradley Bulletin 1492 with 600 volt screw terminals for #22 to #10 conductors, mounted to type N22 channel, or approved equal. Submittal shall show internal elevation of terminal cabinets with equipment laid out.

INTRUSION ALARM SYSTEM
SECTION 28 3100
3595001000

- I. All cables shall be run through fanning strip to terminals of terminal blocks.
- J. All cables entering terminal cabinet shall be identified with T&B Vinyl, Brady Permashield mylar markers, or equal. Upon completion of installation, six (6) copies of one-line "as-built" wiring diagram shall be furnished to Architect.
- K. Each cable run on wiring diagram shall be identified with exact wire marker code (numerical or alphabetical) as appears in terminal cabinets.
- L. Detector locations shown on drawings are approximate only. Exact locations shall be coordinated with lighting and mechanical equipment and shall be placed in accordance with manufacturer's recommendations (with respect to supply air diffusers, etc.).
- M. Station locations shall be identified by school's actual room numbers and system shall be programmed accordingly. Coordinate actual room numbers with District. Coordinate final programming with District. Contractor shall furnish a printed copy of final programming to District.
- N. End-of-line resistors shall be installed at locations readily accessible, not above an elevation of 10 feet above finish floor or grade, or as shown on Drawings.
- O. No splices shall occur in underground pullboxes. System wiring shall be continuous, without splices, from terminal cabinet to terminal cabinet and control panel to devices. All interior pullboxes shall be accessible and locations shall be recorded on "As-Built" drawings.
- P. Door contacts shall be located 6" from strike side of door and both the switch and magnet shall be "glued" in place with clear silicone. Wiring shall enter door frame through jamb. Do not drill headers.
- Q. Each detector installed in this contract shall have a popit. Each door contact installed in this contract shall have a popit, unless door contacts are shown grouped on drawings. In rooms with accessible ceilings, mount popit in junction box above ceiling. Where hard ceilings occur, provide flush box high on wall or on ceiling with blank finish plate. Wiring shall go to popits, then down to detectors.
- R. Protected areas accessing remote keypads shall be wired and connected on delay zone, separate from all other protected areas.
- S. After all equipment is installed and is operational, Intrusion Alarm System subcontractor shall set angle settings, sensitivity settings, etc., of each detector to ensure optimum performance and minimal false alarms. Mask out areas of each motion type detector to remove sources of false alarms (windows, heaters, air diffusers, etc.) from detection zones.

3.2 CONSTRUCTION MEETINGS

- A. The Contractor shall schedule construction meetings at the jobsite as follows:
 - 1. Pre-rough-in meeting shall occur before installation of any boxes, raceways, etc. Exact locations of all detectors shall be established as recommended by the Intrusion Alarm System subcontractor.

2. Prewire meeting shall occur after raceways are installed and prior to pulling of any wire or cable.
3. Pre-termination meeting shall occur after wire and cable has been installed and prior to termination.
- B. Meetings shall be scheduled by the Contractor on a building by building basis and shall include the Project Inspector, School's Representative, the electrical subcontractor, and the Intrusion Alarm System subcontractor as a minimum.
- C. One-half to three-quarters of the way through project, District Facilities will set up a meeting (preferably at the school site) with decision makers from Facilities, Police Services, Maintenance, Maintenance Alarm Tech, General Contractor, Alarm Sub-contractor, and School Administrator to review the alarm protocol and to identify responsible personnel and timelines.

3.3 TESTS

- A. After all equipment specified herein has been installed and is in operating condition, performance tests shall be conducted to determine that installation and components comply with these specifications.
 1. Testing shall be scheduled by the Contractor and shall be conducted at time least disruptive to school activities and as approved by District. Contractor shall provide technicians to conduct all testing (from same firm preparing submittals and performing intrusion alarm work). Testing shall be coordinated to include the Project Inspector and a representative from Engineer's office.
 2. At time of testing, Contractor shall ensure that his submittal will reflect all materials and work necessary to make new equipment function properly with existing.
 3. Contractor shall furnish all instruments and personnel required for tests.
 4. Conduct tests for following:
 - a. Verify that the system is free of grounds or open circuits. The central control board shall indicate when a ground or open circuit exists.
 - b. Verify that devices are functioning as specified.
- B. Testing shall be reconducted to verify correction of any defect found in initial testing.
- C. After system is completely tested, the Contractor shall take the following actions with the Owner:
 1. The Contractor will schedule a meeting with the Alarm Sub-contractors and Owner's Representatives to determine alarm zone and device nomenclature. The Contractor shall ensure that the alarm zone and device nomenclature matches the actual building and door or room numbers used by the school. Architectural numbering shall not be used. Once confirmed, the Contractor shall demonstrate this to Owner's Representatives.

**INTRUSION ALARM SYSTEM
SECTION 28 3100
3595001000**

- END OF SECTION -

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Engineered fill materials.
 - 2. Imported engineered fill material.
 - 3. Landscape backfill material'
 - 4. Decomposed granite.
 - 5. Aggregate base.

1.2 RELATED REQUIREMENTS

- A. Section 01 5000, Temporary Facilities and Controls.
- B. Section 01 8113, Sustainable Design Requirements, for CAL-Green ~~and Collaborative for High Performance Schools (CHPS)~~ general requirements and procedures.
- C. Section 31 2333, Trenching and Backfilling.
- D. Section 32 1200, Asphalt Concrete Paving.
- E. Section 32 1600, Site Concrete.
- F. Section 33 0000, Utilities
- G. Section 33 4000, Storm Drainage Utilities.

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CAL Green), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- C. Local Jurisdiction: Any work within the street, highway or right-of-way shall be performed in accordance with the requirement of the governmental agencies having jurisdiction, and shall not begin until all of those governing authorities have been notified.
- D. ASTM International (ASTM):
 - 1. D698-00 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures, Using 5.5 lb (2.49 Kg) Rammer and 12 inch (304.8 mm) Drop.
 - 2. D1556-00 - Test Method for Density of Soil in Place by the Sand-Cone Method.

**EARTHWORK
SECTION 31 0000
3595001000**

3. D1557-02e2 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 10 lb. (4.54 Kg) Rammer and 18 inch (457 mm) Drop.
4. D3017-05 Test Methods for Moisture Content of Soils and Soil-Aggregate Mixture by Nuclear Methods (Shallow Depth).
5. D422-63(2007) e1 Test Method for Particle Size Analysis of Soil.
6. D4318-05 Test Method for Liquid Limit, Plastic Limit, and Plasticity Limit.

E. CALTRANS Standard Specifications Section 17.

F. CAL-OSHA, Title 8, Section 1590 (e).

1.4 ADMINISTRATION REQUIREMENTS

A. Submittal Procedures:

1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
3. Sustainable Design Submittals shall comply with the additional requirements of Section 01 8113, Sustainable Design Requirements.

B. Site Visitation: All bidders interfacing with existing conditions shall visit the site prior to bid to verify general conditions of improvements. Discrepancies must be reported prior to the bid for clarification.

1.5 ACTION SUBMITTALS

A. Provide supplier's descriptive literature for all products to demonstrate compliance with specified attributes.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Contractor / Installer.

1.7 CLOSEOUT SUBMITTALS

A. Guarantee: Submit subcontractor's guarantee.

1.8 QUALITY ASSURANCE

A. Contractor / Installer shall have been in business for five (5) years providing/finishing similar size projects and complexity.

B. Contractor shall be solely responsible for all subgrades built. Failures resulting from inadequate compaction or moisture content are the responsibility of the contractor. Contractor shall be solely responsible for any and all repairs.

C. The representatives of the Owner's testing lab will not act as supervisor of construction, nor will they direct construction operations. Neither the presence of the Owner's testing

lab representatives nor the testing by the Owner's testing lab shall excuse the contractors or subcontractors for defects discovered in their work during or following completion of the project. Correcting of inadequate compaction or moisture content is the sole responsibility of the contractor.

- D. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.
- E. All materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.
- F. Tests (See Part 3, Article "Testing and Observation" for Compaction Testing).

1.9 DELIVERY, STORAGE AND HANDLING

- A. Transport, store and handle in strict accord with the local jurisdiction.

1.10 FIELD CONDITIONS

1.11 EXISTING SITE CONDITIONS

- A. Contractor shall acquaint himself with all site conditions. If unknown active utilities are encountered during work, notify Architect promptly for instructions. Failure to notify will make Contractor liable for damage to these utilities arising from Contractor's operations subsequent to discovery of such unknown active utilities.
- B. Existing civil, mechanical and electrical improvements are shown on respective site plans to the extent known. Should the Contractor encounter any deviation between actual conditions and those shown, he is to immediately notify the Architect before continuing work.

1.12 ON SITE UTILITY VERIFICATION AND REPAIR PROCEDURES

- A. Ground-breaking requirements:
 - 1. All underground work performed by a Contractor must be authorized by the District's Construction Manager or the Low Voltage Consultant prior to start of construction.
 - 2. The Contractor is to obtain and keep the original School's construction utility site plans on site during all excavation operations. Contractor can contact the District's Construction Manager, Facilities Manager, or the Low Voltage Consultant to procure the drawings.
- B. Underground Utility Locating:
 - 1. The contractor shall hire an Underground Utility Locating Service to locate existing underground utility pathways in areas effected by the scope of work for excavation.
 - 2. Contractor must use an underground utility locator service with a minimum of 3 years experience. The equipment operator must have demonstrated experience.

EARTHWORK
SECTION 31 0000
3595001000

Contact Norcal Underground Locating (800/986-6722) or Precision Locating (800/577-7324)

3. The Underground Utility Locator Service must have the use of equipment with the ability to locate by means of inductive clamping, induction, inductive metal detection, conductive coupling, or TransOnde (Radiodetection) to generate signals, passive locating (free scoping) for "hot" electric, and metal detector.
4. The Underground Utility Locator Service must be able to locate existing utilities at a depth of at least 72".
5. The Underground Utility Locator Service must be able to locate but are not limited to locating the following types of utility pathways:
 - a. All conduit pathways containing 110 volt or greater 50-60Hz electrical wire.
 - b. All conduit pathways containing an active cable TV system.
 - c. All conduit pathways containing wire or conductor in which a signal can be attached and generated without damaging or triggering the existing systems.
 - d. All empty conduit pathways or pipe in which a signal probe or sonde (miniature transmitter) can be inserted.
 - e. All conduit pathways containing non-conductive cables or wires in which a signal probe or sonde (miniature transmitter) can be inserted.
 - f. All plastic and other nonconductive water lines in which a TransOnde Radiodetection) or other "transmitter" can be applied to create a low frequency pressure wave (signal) without damaging or triggering the existing systems.
 - g. All copper or steel waterlines and plastic or steel gas lines.
6. All markings made by the Underground Utility Locator Service or other shall be clear and visible.
7. The contractor shall maintain all markings made by Underground Utility Locator Service or other throughout the entire length of the project.
8. The Underground Utility Locator Service shall provide the contractor with two sets of maps showing the location of utilities and average depth. They will be referenced to permanent buildings. Contractor will deliver one copy to the district at no additional charge.
9. Contractor is responsible to contact Underground Service Alert (U.S.A. 800/227-2600) and receive clearance prior to any excavation operations.
10. Contractor shall inform the (District's Construction Manager)(Architect)(Owner) no later than five (5) days prior to the date scheduled for the utility locator service to be on site.

1.13 PROTECTION

- A. Adequate protection measures shall be provided to protect workmen and passers-by on and off the site. Adjacent property shall be fully protected throughout the operations. Blasting will not be permitted. Prevent damage to adjoining improvements and properties both above and below grade. Restore such improvements to original condition should damage occur. Replace trees and shrubs outside building area disturbed by operations.

- B. In accordance with generally accepted construction practices, the Contractor shall be solely and completely responsible for working conditions at the job site, including safety of all persons and property during performance of the work. This requirement shall apply continuously and shall not be limited to normal working hours.
- C. Any construction review of the Contractor's performance conducted by the Geotechnical Engineer is not intended to include review of the adequacy of the Contractor's safety measures, in, on, or near the construction site.
- D. Provide shoring, sheeting, sheet piles and or bracing to prevent caving, erosion or gullyng of sides of excavation.
- E. Surface Drainage: Provide for surface drainage during period of construction in manner to avoid creating nuisance to adjacent areas. The contractor shall make a reasonable effort on a daily basis to keep all excavations and the site free from water during entire progress of work, regardless of cause, source, or nature of water.
- F. Adjacent streets and sidewalks shall be kept free of mud, dirt or similar nuisances resulting from earthwork operations.
- G. The site and adjacent influenced areas shall be watered as required to suppress dust nuisance. Dust control measures shall be in accordance with the local jurisdiction.
- H. Trees: Carefully protect existing trees that are to remain. Provide temporary irrigation as necessary to maintain health of trees.

1.14 SEASONAL LIMITS

- A. No fill material shall be placed, spread or rolled during unfavorable weather conditions. When work is interrupted by rains, fill operations shall not be resumed until field tests indicate that moisture content and density of fill are satisfactory.
- B. Excessively wet fill material shall be bladed and aerated per Article "Subgrade Preparation".

1.15 TESTING

- A. General: Refer to Section 01 4523 - TESTING AND INSPECTION SERVICES, AND STRUCTURAL TESTS AND INSPECTIONS LIST, DSA-103.
- B. Geotechnical Engineer: Owner is retaining a Geotechnical Engineer to determine compliance of fill with Specifications, and to direct adjustments in fill operations. Costs of Geotechnical Engineer will be borne by Owner; except those costs incurred for re-tests or re-inspection will be paid by Owner and backcharged to Contractor.
 - 1. If Contractor elects to process or mine onsite materials for use as Suitable Fill, Aggregate Sub Base, Aggregate Base, Rock, Crushed Rock or sand the cost of all testing of this material shall be paid for by the Contractor.
 - 2. Testing of import fill for compliance with Department of Toxic Substance Control (DTSC) shall be paid for by the Contractor.

**EARTHWORK
SECTION 31 0000
3595001000**

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Engineered Fill Materials: All fill shall be of approved local materials supplemented by imported fill if necessary. "Approved" local materials are defined as local soils tested and approved by Geotechnical Engineer free from debris, and concentrations of clay and organics; and contain rocks no larger than 3-inches in greatest dimension. The soil and rock should be thoroughly blended so that all rock is surrounded by soil. This may require mixing of the soil and rock with a dozer prior to placement and compaction. Clods, rocks, hard lumps or cobbles exceeding 3-inches in final size shall not be allowed in the upper 6 inches of any fill. Native clay or clayey soils will not be permitted within the upper 12 inches of building pad areas or paved areas.
- B. Imported Engineered Fill Material: Imported fill may be required to complete work. Proposed import fill material shall meet the above requirements; shall be similar to the native soils. Import fill shall meet the above requirements; shall have plasticity index of 20 or less; an Expansion Index of 15 or less; be free of particles greater than 3-inch (3") in largest dimension; be free of contaminants and have corrosion characteristics within the acceptable limits. All import fill material shall be tested and approved by Soils Engineer prior to transportation to the site. Proposed fill material shall comply with DTSC guidelines to include Phase 1 environmental site assessment and related tests. Refer to the October 2001 DTSC Information Advisory for clean imported fill material.
1. DTSC TESTING: Site work contractor is to coordinate testing with an analytical lab, hired by the owner, licensed by the State of California for the DTSC testing. The costs associated with testing will be paid by the contractor.
 2. DTSC testing shall include documentation as to the previous land use, location, and history. Soils shall be analyzed for all compounds of concern to ensure the imported soil is uncontaminated and acceptable. Testing shall be performed per the recommendations included in DTSC Imported Fill Advisory (http://www.dtsc.ca.gov/Schools/upload/SMP_FS_Cleanfill-Schools.pdf). Soils shall be tested prior to import to the project site.
 3. Lab shall determine geographically which tests and analysis comparison will be appropriate for the testing. (CAM 17 / Title 22); (RWQCB) Regional Water Quality Control Board; or (OEHHA) Office of Environmental Health Hazard Assessment.
 4. Frequency of testing shall be conducted in accordance with DTSC's Imported Fill Advisory as follows;

Fill Material Sample Schedule	
Area Of Individual Borrow Area	Sampling Requirements
2 Acres or less	Minimum of 4 samples
2 to 4 Acres	Minimum of 1 sample every ½ acre
4 to 10 Acres	Minimum of 8 samples

**EARTHWORK
SECTION 31 0000
3595001000**

Greater than 10 Acres	Minimum of 8 locations with 4 subsamples per location
-----------------------	---

Volume of Borrow Area Stockpile	
Up to 1,000 Cubic Yards	1 sample per 250 cubic yards
1,000 to 5,000 Cubic Yards	4 samples for the first 1000 cubic yards + 1 sample per each additional 500 cubic yards
Greater than 5,000 Cubic Yards	12 samples for the first 5,000 cubic yards + 1 sample per each additional 1,000 cubic yards

5. Reports/ Documentation
 - a. Results of the testing analysis shall be sent to the Owner; Architect; Project Inspector, Project Civil Engineer, DTSC, and DSA. Letter shall reference DSA file and application numbers.
- C. Landscape Backfill Material:
 1. The top 3" of native topsoil stripped from the site may be used for landscape backfill material.
- D. Water: Furnish all required water for construction purposes, including compaction and dust control. Water shall be potable.
- E. Aggregate Base: Provide Class 2 3/4" Aggregate Base conforming to standard gradation as specified in Cal Trans Standard Specifications, Section 26,-1.02A.
- F. Decomposed Granite: Decomposed Granite shall be well graded mixture of fine to 1/8" particles in size with no clods. The material shall be free of vegetation, other soils, debris and rock. The material shall be redish-tan to tan in color.
- G. Decomposed Granite Solidifier: PolyPavement or equal.

PART 3 - EXECUTION

3.1 INSPECTION LAYOUT AND PREPARATION

- A. Prior to installation of the work of this Section, carefully inspect and verify by field measurements that installed work of all other trades is complete to the point were this installation may properly commence
- B. Layout all work, establish grades, locate existing underground utilities, set markers and stakes, setup and maintain barricades and protection facilities; all prior to beginning

**EARTHWORK
SECTION 31 0000
3595001000**

actual earthwork operations. Layout and staking shall be done by a licensed Land Surveyor or Professional Civil Engineer.

- C. Verify that specified items may be installed in accordance with the approved design.
- D. In event of discrepancy, immediately notify Owner and the Architect. Do not proceed in discrepant areas until discrepancies have been fully resolved.

3.2 PERFORMANCE

A. GENERAL:

- 1. General: Do all grading, excavating and cutting necessary to conform finish grade and contours as shown. All cuts shall be made to true surface of subgrade.
- 2. Archaeological Artifacts: Should any artifacts of possible historic interest be encountered during earthwork operations, halt all work in area of discovery and immediately contact the Architect for notification of appropriate authorities.
- 3. Degree of Compaction: Percentage of maximum density, hereinafter specified as degree of compaction required, means density equivalent to that percentage of maximum dry density determined by ASTM D1557 Compaction Test method, and such expressed percentage thereof will be minimum acceptable compaction for specified work.
- 4. Moisture Content: Moisture content shall be as noted below and as called for on the plans. Moisture content shall be maintained until subgrade is covered by surfacing materials.

3.3 DEMOLITION, DISPOSAL AND DISPOSITION OF UNDESIRABLE MAN-MADE FEATURES

- A. All other obstructions, such as abandoned utility lines, septic tanks, concrete foundations, and the like shall be removed from site. Excavations resulting from these removal activities shall be cleaned of all loose materials, dish shaped, and widened as necessary to permit access for compaction equipment. Areas exposed by any required over-excavation should be scarified to a depth of 12", moisture-conditioned to near optimum moisture content, and recompacted to at least 95% of the maximum dry density.

3.4 TESTING AND OBSERVATION

- A. All grading and earthwork operations shall be observed by the Geotechnical Engineer or his representative, serving as the representative of the Owner.
- B. Field compaction tests shall be made by the Geotechnical Engineer or his representative. If moisture content and/or compaction are not satisfactory, Contractor will be required to change equipment or procedure or both, as required to obtain specified moisture or compaction. Notify Geotechnical Engineer at least 48 hours in advance of any filling operation.
- C. Earthwork shall not be performed without the notification or approval of the Geotechnical Engineer or his representative. The Contractor shall notify the Geotechnical Engineer at least two (2) working days prior to commencement of any aspect of the site earthwork.

- D. If the Contractor should fail to meet the compaction or design requirements embodied in this document and on the applicable plans, he shall make the necessary readjustments until all work is deemed satisfactory, as determined by the Geotechnical Engineer or Architect/Engineer.
- E. After each rain event Geotechnical Engineer shall test fill material for optimum moisture. Do not place any fill material until desired moisture is achieved.

3.5 CLEARING AND GRUBBING

- A. Prior to grading, remove all debris off-site. Remove trees and brush including the root systems. Holes resulting from tree and brush removal should be prepared and backfilled in accordance with paragraphs 3.7, 3.8, 3.9, and 3.10. This may require deepening and/or widening the holes to adequately remove disturbed soil and provide room for compaction equipment. Strip the surface of all organics. Strippings meeting the requirements of Section 32 9000 may be used in landscape areas only.

3.6 CUTTING

- A. Building pads that are located within a cut/fill transition area will have to be overexcavated to provide a semi-uniform fill beneath the building pad. The portions of building pads located in cut areas shall be overexcavated to provide no more than 1 foot difference in fill placed in the same building pad.
- B. Do all cutting necessary to bring finish grade to elevations shown on Drawings.
- C. When excavation through roots is necessary, cut roots by hand.
- D. Carefully excavate around existing utilities to avoid unnecessary damage. The contractor shall anticipate and perform hand work near existing utilities as shown on the survey, without additional claims or cost.

3.7 STRUCTURAL EXCAVATION

- A. General: Excavate to bear on firm material at contract depth shown on Structural Drawings.
- B. Footings: All footing excavations shall be of sufficient width for installation of formwork, unless earth will retain its position during concreting. All portions of footings above grade must be formed. In the event that footings are placed against earth, footing widths below grade shall be increased 2 inches from those shown on Drawings and positive protection shall be provided for top corners of trench.
- C. Unsuitable Ground: Any errors in structural excavation, soft ground, or clay soils found when excavating shall be reported to Architect. In no case shall work be built on any such soft or clayey unsuitable surface without direction from the Architect. Restore excavations to proper elevation with engineered fill material compacted to 95% of dry density.

EARTHWORK
SECTION 31 0000
3595001000

3.8 SUBGRADE PREPARATION

- A. Grade compact and finish all subgrades within a tolerance of 0.10' of grades as indicated on Drawings and so as not to pool water. Subgrade within building pads and concrete walks shall be within 0.05' of grades indicated.
- B. After clearing, grubbing and cutting, subsurface shall be plowed or scarified to a depth of at least 12", until surface is free from ruts, hummocks or other uneven features. Moisture condition to 2% above optimum moisture content and recompact to at least 95% of the maximum dry density as determined by ASTM Test Method D1557. If the existing soils are at a water content higher than specified, the contractor shall provide multiple daily aerations by ripping, blading, and/or discing to dry the soils to a moisture content where the specified degree of compaction can be achieved. After seven consecutive working days of daily aerations, and the moisture content of the soil remains higher than specified, the contractor shall notify the architect. If the existing soils have a moisture content lower than specified, the contractor shall scarify, rip, water and blade existing soil to achieve specified moisture content. The contractor shall make proper allowance in schedule and methods to complete this work.
- C. After subgrade for fill within building pad area or within paved areas has been cleared, plowed and scarified, it shall be disked or bladed until uniform and free from large clods, brought to 2% above optimum moisture content and compacted to not less than 95% of maximum dry density, as determined by ASTM Test Method D1557, and such expressed percentage thereof will be minimum acceptable density for specified work.
- D. Subgrade in areas to receive landscaping shall be compacted to (85%).
- E. Where Contractor over-excavates building pads through error, resulting excavation shall be recompacted as engineered fill at Contractor's expense.

3.9 PLACING, SPREADING AND COMPACTING FILL MATERIAL IN BUILDING PAD AND PAVEMENT AREAS

- A. Selected fill material shall be placed in layers which, when compacted, shall not exceed 6 inches in compacted thickness. Each layer shall be spread evenly and thoroughly mixed to insure uniformity in moisture content.
- B. Selected fill material shall be moisture-conditioned to specified moisture content. Selected fill material shall be unfrozen. When moisture content of fill material is below that specified, add water until proper moisture content is achieved. When moisture content is above that specified, aerate by blading or other methods mentioned in 3.08 B until moisture content is satisfactory.
- C. After each layer has been placed, mixed and spread evenly, it shall be thoroughly compacted to a minimum of 90% as determined by the ASTM D1557 Compaction Test. Compact each layer over its entire area until desired density has been obtained.
- D. Recomposition of Fill in Trenches and Compaction of Fill Adjacent to Walls: Where trenches must be excavated, backfill with material excavated. Place in lifts that when compacted do not exceed 6", moisture conditioned to (optimum)(2% above optimum)

moisture content, and compact to a minimum of 90% relative compaction in building pad and paved areas, and to 90% relative compaction in landscape areas.

- E. Jetting of fill materials will not be allowed.

3.10 FINAL SUBGRADE COMPACTION

- A. Building Pads: Upper 12" of all final building pad subgrades (including future buildings) shall be uniformly compacted at specified moisture content to at least 90% of maximum dry density, as determined by ASTM D1557 Compaction Test, regardless of whether final subgrade elevation is attained by filling, excavation, or is left at existing grade. After acceptance of final compaction test, contractor shall maintain the required moisture content of subgrade until concrete flatwork is placed.
- B. Paved Areas: Upper 12" of all final subgrades supporting pavement sections and all other flatwork shall be brought to specified moisture content and shall be uniformly compacted to not less than 95% of maximum dry density, regardless of whether final subgrade elevation is attained by filling, excavation, or is left at existing grade. After acceptance of final compaction test, contractor shall maintain the required moisture content of subgrade until concrete flatwork is placed.
- C. Other Fill and Backfill: Upper 12" of all other final subgrades or finish grades shall be compacted to 90% of maximum dry density.
- D. Gravel Fill: Do not place compacted gravel fill until after underground work and foundations are in place. Compact gravel fill with vibratory plate or similar equipment to preclude settlement.

3.11 PLACING, SPREADING, AND COMPACTION OF LANDSCAPE BACKFILL MATERIALS

- A. All landscaped areas shall receive topsoil. After subgrade under landscape area has been scarified and brought to 85% maximum dry density, top soil shall be placed evenly to depth of 12" at 85% of maximum dry density.
- B. Project Inspector must verify that materials are uniformly spread to minimum depth specified.

3.12 SLOPE CONSTRUCTION

- A. Cut slopes shall be constructed to no steeper than 2:1(horizontal:vertical). Fill slopes shall be constructed to no steeper than 2:1 (horizontal:vertical). Prior to placement of fill on an existing slope the existing slope shall be benched. The benches shall be in a ratio of 2 horizontal to 1 vertical. The face of the fill slopes shall be compacted as the fill is placed, or the slope may be overbuilt and then cut back to the design grade. Compaction by track walking will not be allowed.

3.13 FINISH GRADING

- A. At completion of project, site shall be finished graded, as indicated on Drawings. Finish grades shall be "flat graded" to grades shown on the drawing. Mounding of finish grades

**EARTHWORK
SECTION 31 0000
3595001000**

will not be allowed unless otherwise directed on the landscape drawings. Tolerances for finish grades in drainage swales shall be $\pm 0.05'$. Tie in new and existing finish grades. Leave all landscaped areas in finish condition for lawn seeding. Landscaped planters shall be graded uniformly from edge of planter to inlets. If sod is used for turf areas the finish grade on which it is placed shall be lowered to allow for sod thickness.

- B. All landscape areas shall be left free of rock or foreign material.
- C. All landscape areas shall be approved by Architect prior to any planting.

3.14 SURPLUS MATERIAL

- A. Excavated material not required for grading or backfill shall be removed from site at contractor's expense.

3.15 CLEANING

- A. Refer to Section 01 7700.
- B. Remove from fill all vegetation, wood, form lumber, casual lumber, and shavings, in contact with ground; buried wood will not be permitted in any fill.

END OF SECTION

*s:\master specifications\division 31 - earthwork\31 0000_earthwork.docx
Received from WCEI: June 7, 2018, Updated format: 9-3-21*

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Trench backfill materials.

1.2 RELATED REQUIREMENTS

- A. Section 01 5000, Temporary Facilities and Controls.
- B. Section 01 8113, Sustainable Design Requirements, for CAL-Green **[and Collaborative for High Performance Schools (CHPS)]** general requirements and procedures.
- C. Section 31 0000, Earthwork.
- D. Section 32 8000, Irrigation.
- E. Section 33 0000, Utilities
- F. Section 33 4000, Storm Drainage Utilities.

1.3 REREENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CAL Green), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- C. California Plumbing Code (CPC), edition as noted on the drawings.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Submittal Procedures:
 - 1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
 - 2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
 - 3. Sustainable Design Submittals shall comply with the additional requirements of Section 01 8113, Sustainable Design Requirements.
- B. Coordination:
 - 1. General Contractor shall coordinate work as herein specified, in accordance with drawings and as required to complete scope of work with all related trades.

TRENCHING AND BACKFILLING
SECTION 31 2333
3595001000

1.5 ACTION SUBMITTALS

- A. Provide supplier's descriptive literature for all products to demonstrate compliance with specified attributes:

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For contractor / Installer.

1.7 CLOSEOUT SUBMITTALS

- A. Guarantee: Submit subcontractor's guarantee.

1.8 QUALITY ASSURANCE

- A. Contractor / Installer shall have been in business for five (5) years providing/finishing similar size projects and complexity.
- B. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.
- C. All materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.

1.9 DELIVERY, STORAGE AND HANDLING

- A. Transport, store and handle in strict accord with the local jurisdiction.

1.10 FIELD CONDITIONS

- A. Contractor shall acquaint himself with all existing site conditions. If unknown active utilities are encountered during work, notify Architect promptly for instructions. Failure to notify will make Contractor liable for damage to these utilities arising from Contractor's operations subsequent to discovery of such unknown active utilities.
- B. Trench dewatering may be necessary. Contractor shall provide any and all tools, equipment and labor necessary for trench dewatering no matter what the source. Dewatering shall be continuous until all site utilities are installed and backfilled.

1.11 PROTECTION

- A. Adequate protection measures shall be provided to protect workers and passers-by on and off the site. Adjacent property shall be fully protected throughout the operations. Blasting will not be permitted. Prevent damage to adjoining improvements and properties both above and below grade. Restore such improvements to original condition should damage occur. Replace trees and shrubs outside building area disturbed by operations. Repair all trenches in grass areas with new sod (seeding not permitted) and "stake-off" for protection.

TRENCHING AND BACKFILLING
SECTION 31 2333
3595001000

- B. Contractor shall be solely and completely responsible for working conditions at the job site, including safety of all persons and property during performance of the work. This requirement shall apply continuously and shall not be limited to normal working hours.
- C. Any construction review of the Contractor's performance conducted by the Architect or Owner is not intended to include review of the adequacy of the Contractor's safety measures, in, on or near the construction site.
- D. Provide shoring, sheeting, sheet piles and or bracing to prevent caving, erosion or gulying of sides of excavation.
- E. Surface Drainage: Provide for surface drainage during period of construction in manner to avoid creating nuisance to adjacent areas. Keep all excavations free from water during entire progress of work, regardless of cause, source or nature of water.
- F. Adjacent streets and sidewalks shall be kept free of mud, dirt or similar nuisances resulting from earthwork operations.
- G. The site and adjacent influenced areas shall be watered as required to suppress dust nuisance.
- H. Trees: Carefully protect existing trees which are to remain.

1.12 TRENCH SAFETY PROVISIONS

- A. General Contractor shall be solely responsible for safety design, construction and coordination with agencies having jurisdiction. If such plan varies from shoring system standards established by Construction Safety Orders, plan shall be prepared by registered civil or structural engineer.
- B. Nothing herein shall be deemed to allow use of shoring, sloping or protective system less effective than that required by Construction Safety Orders of California State Division of Industrial Safety.
- C. When trenching through paved surface, provide steel trench plates to cover open trenches daily until trenches are backfilled.

1.13 SEASONAL LIMITS

- A. No backfill material shall be placed, spread or rolled during unfavorable weather conditions. When work is interrupted by heavy rains, full operations shall not be resumed until field tests indicate that moisture content and density of fill are satisfactory.
- B. Material above optimum moisture shall be processed per Section 31 0000, Part 3, Article "Subgrade Preparation".

1.14 TESTING

- A. General: Refer to Section 31 0000, Part 1, Article "Testing" and Part 3, Article "Testing and Observation".

TRENCHING AND BACKFILLING
SECTION 31 2333
3595001000

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Backfill materials: Pipeline and conduit trench backfill as shown on the plans and as specified below.
 - 1. ¾ inch crush rock.
 - 2. Native Materials: Soil native to Project Site, free of wood, organics, and other deleterious substances. Rocks shall not be greater than 3-inches.
 - 3. Sand: Fine granular material, free of organic matter, mica, loam or clay.
 - 4. Lean Mix Concrete: 3 sacks of cement per yard plus sand.
 - 5. Class 2 aggregate base, ¾" rock, per Caltrans Section 26-1.02B
 - 6. Controlled Density Fill: 3 sack slurry backfill.
- B. Water: Furnish all required water for construction purposes, including compaction and dust control. Water shall be potable.
- C. Provide other bedding and backfill materials as described and specified in Section 33 0000, Section 33 4000 and Divisions 22 and 26.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verification of Conditions:
 - 1. Examine areas and conditions under which work is to be performed.
 - 2. Identify conditions detrimental to proper or timely completion of work and coordinate with General Contractor to rectify.

3.2 INSTALLATION

- A. Perform work in accordance with pipe manufacturer's recommendations, as herein specified and in accordance with drawings.

3.3 TRENCHING

- A. Make all trenches open vertical construction with sufficient width to provide free working space at both sides of trench around installed item as required for caulking, joining, backfilling and compacting; not less than 12 inches wider than pipe or conduit diameter, unless otherwise noted.
- B. Carefully excavate around existing utilities to avoid unnecessary damage. The contractor shall anticipate and perform hand work near existing utilities as shown on the survey, without additional claims or cost.
- C. Trench straight and true to line and grade with bottom smooth and free of edges or rock points.

TRENCHING AND BACKFILLING
SECTION 31 2333
3595001000

- D. Where depths are not shown on the plans, trench to sufficient depth to give minimum fill above top of installed item measured from finish grade above the utility as follows:
1. Sewer pipe: depth to vary
 2. Storm drain pipe: depth to vary
 3. Water pipe - Fire Supply: 36 inches
 4. Water pipe – Domestic Supply: 30 inches

3.4 BACKFILL

- A. Pipe Trench Backfill is divided into three zones:
1. Bedding: Layer of material directly under the pipe upon which the pipe is laid.
 2. Pipe Zone: Backfill from the top of the bedding to 6 inches (compacted) over the top of the pipe.
 3. Upper Zone: Backfill between top of Pipe Zone and to surface of subgrade.
- B. Bedding: Type of material and degree of compaction for bedding backfill shall be as defined in the Details and Specifications.
- C. Pipe Zone and Upper Zone Backfill:
1. Type of material and degree of compaction Pipe Zone and Upper Zone Backfill shall be as required by Drawings, Details, & Specifications.
 2. Upper Zone Backfill shall not be placed until conformance of Bedding and Pipe Zone Backfill with specified compaction test requirements has been confirmed.
 3. Backfill shall be brought up at substantially the same rate on both sides of the pipe and care shall be taken so that the pipe is not floated or displaced. Material shall not be dropped directly on pipe.
- D. Backfill Compaction:
1. Backfill shall be placed in layers which, when compacted shall not exceed 6 inches in thickness. Each layer shall be spread evenly and thoroughly mixed to insure uniformity. Do not backfill over, wet, frozen or soft subgrade surfaces. Employ a placement method that does not disturb or damage foundation walls, perimeter drainage, foundation damp-proofing, waterproofing or protective cover.
 2. When moisture content of fill material is below that required to achieve specified density, add water until proper moisture content is achieved. When moisture content is above that required, aerate by blading or other methods until specified moisture content is met; see Section 31 0000, Part 3, Article "Subgrade Preparation".
 3. After each layer has been placed, mixed and spread evenly, it shall be thoroughly compacted to 95% of maximum dry density while at specified moisture content. Compact each layer over its entire area until desired density has been obtained.
 4. Compaction: All backfill operations shall be observed by the Inspector of Record and/or Geotechnical Engineer. Field density tests shall be made to check compaction of fill material. If densities are not satisfactory, Contractor will be

TRENCHING AND BACKFILLING
SECTION 31 2333
3595001000

required to change equipment or procedure or both, as required to obtain specified densities. Notify Inspector and Architect at least 24 hours in advance of any operation.

E. Backfill in Areas Previously Lime or Cement Treated

1. Where trenching occurs in areas that have been lime or cement treated, class 2 aggregate bases or approved controlled density backfill material shall be used for the top 12-inches minimum of the trench or thickness shall match the depth of treated material.

3.5 TRENCH AND SITE RESTORATION

- A. Finished surface of trenches shall be restored to a condition equal to, or better than the condition as existed prior to excavation work.

3.6 PROTECTION

- A. Protect existing surfaces, structures, and utilities from damage. Protect work by others from damage. In the event of damage, immediately repair or replace to satisfaction of Owner.
- B. Repair existing landscaped areas to as new condition. Replant trees, shrubs or groundcover with existing materials if not damaged or with new materials if required. Replace damaged lawn areas with sod, no seeding will be permitted.
- C. Replace damaged pavement with new compatible matching materials. Concrete walks to be removed to nearest expansion joint and entire panel replaced. Asphalt to be cut neatly and replaced with new materials.
- D. Any existing materials removed or damaged due to trenching to be returned to new condition.

3.7 SURPLUS MATERIAL

- A. Remove excess excavated material, unused materials, damaged or unsuitable materials from site.

3.8 CLEANING

- A. Refer to Section 01 7700.
- B. Contractor will keep the work areas in a clean and safe condition so his rubbish, waste, and debris do not interfere with the work of others throughout the project and at the completion of work.
- C. After completion of work in this section, remove all equipment, materials, and debris. Leave entire area in a neat, clean, acceptable condition.

TRENCHING AND BACKFILLING
SECTION 31 2333
3595001000

END OF SECTION

s:\master specifications\division 31 - earthwork\31 2333_trenching and backfilling.docx
Received from WCEI: October 20, 2012; Updated 9-2-21

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Concrete curbs and gutters.
2. Concrete pavement, sidewalks and ramps.
3. Steel reinforcing for flatwork and curbs.
4. Truncated domes.

1.2 RELATED REQUIREMENTS

- A. Section 01 6116, Volatile Organic Compound (VOC) Restrictions; for VOC limits pertaining to adhesives, sealants, fillers, primers, and coatings.
- B. Section 01 8113, Sustainable Design Requirements, for CAL-Green **[and Collaborative for High Performance Schools (CHPS)]** general requirements and procedures.
- C. Division 31, Earthwork.
- D. Section 32 1200, Asphalt Concrete Paving.

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CALGreen), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- C. American Concrete Institute (ACI):
1. 117: Specification for Tolerances for Concrete Construction and Materials and Commentary.
 2. 211.1: Standard Practice for Selecting Proportions for Normal, Heavyweight and Mass Concrete.
 3. 301: Specifications for Structural Concrete.
 4. 302.1R: Guide to Concrete Floor and Slab Construction.
 5. 305R: Guide to Hot Weather Concreting.
 6. 306R: Guide to Cold Weather Concreting.
 7. 308R: Guide to External Curing of Concrete.
 8. 318: Building Code Requirements for Structural Concrete and Commentary.
 9. 347R: Guide to Formwork for Concrete.
- D. ASTM International (ASTM):

1. A615/A615M: Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement.
 2. A706/A706M: Standard Specification for Deformed and Plain Low-Alloy Steel Bars for Concrete Reinforcement.
 3. C33/C33M: Standard Specification for Concrete Aggregates.
 4. C94/C94M: Standard Specification for Ready-Mixed Concrete.
 5. C143/C143M: Standard Test Method for Slump of Hydraulic-Cement Concrete.
 6. C150/C150M: Standard Specification for Portland Cement.
 7. C260/C260M: Standard Specification for Air-Entraining Admixtures for Concrete.
 8. C309: Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete.
 9. C330/C330M: Standard Specification for Lightweight Aggregates for Structural Concrete.
 10. C494/C494M: Standard Specification for Chemical Admixtures for Concrete.
 11. C618: Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete.
 12. C920: Standard Specification for Elastomeric Joint Sealants.
 13. C1107/C1107M: Standard Specification for Packaged Dry, Hydraulic Cement Grout (Non-Shrink).
 14. C1315: Standard Specification for Liquid Membrane-Forming Compounds Having Special Properties for Curing and Sealing Concrete.
 15. D1751: Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types).
 16. D5893/D5893M: Standard Specification for Cold Applied, Single Component, Chemically Curing Silicone Joint Sealant for Portland Cement Concrete Pavements.
- E. Concrete Reinforcing Steel Institute (CRSI):
1. Manual of Standard Practice.
 2. Placing Reinforcing Bars.
- F. State of California, Department of Transportation (Caltrans):
1. Division of Engineering Services:
 - a. California Test 342: Method of Test for Surface Skid Resistance with the California Portable Skid Test.
 2. Standard Specifications.
 - a. Section 51, Concrete Structures.
 - b. Section 52, Reinforcement.
 - c. Section 73, Concrete Curbs and Sidewalks.
 - d. Section 90, Concrete.
- G. US Government General Services Administration (GSA/SAE):

1. GSA/SAE AMS-STD-595A: Colors Used In Government Procurement.

1.4 ADMINISTRATIVE REQUIREMENTS

A. Submittal Procedures:

1. Action Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
3. Sustainable Design Submittals shall comply with the additional requirements of Section 01 8113, Sustainable Design Requirements.

1.5 ACTION SUBMITTALS

A. Shop Drawings: Joint pattern layout for walks and pavement.

B. Product Data:

1. A complete list of materials proposed to be used for the site concrete work including, but not limited to, sand, gravel, admixtures, surface treatments, coloring agents, sealers, cast-in-place accessories, forming and curing products, concrete mix designs, reinforcing materials, joint materials, curing materials, and detectable warning surface.
2. Manufacturer's descriptive literature for products proposed for use. Include installation instructions, and maintenance instructions.

C. Concrete Mix Design: The Contractor shall submit three copies of each proposed mix design for each class of concrete in accordance with ACI 301, Sections 3.9 "Proportioning on the Basis of Previous Field Experience or Trial Mixture," or 3.10 "Proportioning Based on Empirical Data." The Contractor shall submit a separate mix design for concrete to be placed by pumping, in addition to the mix design for concrete to be placed directly from the truck chute.

1. The following information shall be included in the concrete mix design:
 - a. Proportions of cement, fine and coarse aggregate, and water.
 - b. Water-cement ratio, 28-day compressive design strength, slump, and air content.
 - c. Type of cement and aggregate.
 - d. Special requirements for pumping.
 - e. Range of ambient temperature and humidity for which design is valid.
 - f. Special characteristics of mix, which require precautions in mixing, placing, or finishing techniques to achieve specified finished product.
2. Do not begin concrete production until mixes have been reviewed and approved by Engineer.
 - a. Review of mix design by the Architect and Engineer shall in no way relieve the subcontractor of his responsibility for the performance of the concrete.

D. Qualification Data: For manufacturer

- E. Delivery tickets as specified for ready-mixed concrete.
- F. Sustainable Design:
 - 1. General:
 - a. Submit information necessary to establish and document compliance with the California Green Building Standards Code.
 - b. Sustainable design submittals are in addition to other submittals.
 - 2. The following information shall be provided:
 - a. Adhesives and Sealants: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.
 - b. Paints and Coatings: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.

1.6 CLOSEOUT SUBMITTALS

- A. Guarantee: Submit subcontractor's guarantee.

1.7 QUALITY ASSURANCE

- A. Qualifications:
 - 1. Manufacturer of ready-mixed concrete products shall meet ASTM C94/C94M requirements for production facilities and equipment.
- B. Design, erect, support, brace and maintain formwork and shoring to safely support all loads that might be applied until such loads can be carried by concrete.
- C. The Contractor shall perform work in accordance with ACI 301.
- D. Use only new materials and products.
- E. Single-Source Responsibility: Use materials and products of one manufacturer whenever possible.
- F. Materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.
- G. Testing to determine compliance with the work of this Section will be the responsibility of the Contractor.
 - 1. Cement and reinforcing shall be tested in accordance with CBC Section 1910A. Testing of reinforcing may be waived in accordance with Section 1910A.2 when approved by the Engineer and DSA.
 - 2. Testing will be performed by an independent testing and inspecting agency in accordance with Section 01 4523, Testing and Inspection Services, and paid for by the Owner.
 - 3. Refer to Article FIELD QUALITY CONTROL in Part 3 of this Section for additional requirements.

4. Cost of retests and coring due to low strength or defective concrete will be paid by the Owner and back-charged to the Contractor.
- H. Sieve analysis from testing laboratories identifying rock/sand percentages within the concrete mix; or class 2 aggregate base shall have the current Project name and Project location identified on the report. Outdated analytical reports greater than 90 days old will not be accepted.
- I. Mockups: Provide on-site mockup panels for each type of exposed colored concrete flatwork showing texture and color before proceeding with finish to be used on this Project.
 1. Construct sample panels after review and approval of samples.
 2. Size: Minimum 5 feet square and have at least one longitudinal and one transverse joint unless a more specific note indicates otherwise on Drawings.
 3. Construct sample panels at location approved by Architect.
 4. Construct sample panels in ample time to allow for finishing and curing before requesting Architect to review.
 5. Follow procedures used on accepted samples.
 6. Include saw-cut and tooled joints to match method and appearance proposed for use in completed work.
 7. Prepare successive sample panels as required until finish, color, and appearance is approved by Architect.
 8. Do not remove sample panels until authorized in writing by the Architect and all concrete work has been approved.

1.8 DELIVERY, STORAGE AND HANDLING

- A. Deliver undamaged products to job in manufacturer's sealed containers and/or original bundles with tags and labels intact.
- B. Store materials in protected, dry conditions off of ground and in areas so as to not interfere with the progress of the Work.
- C. Transport, store and handle in strict accordance with the manufacturer's written recommendations.
- D. Store cement in weather tight building, permitting easy inspection and identification. Protect from dampness. Lumpy or stale cement will be rejected.
- E. Aggregates: Prevent excessive segregation, or contamination with other materials or other sizes of aggregate. Use only one supply source for each aggregate stock pile.

1.9 FIELD CONDITIONS

- A. Make and be responsible for all field dimensions necessary for proper fitting, slopes, and completion of work. Report discrepancies to Architect before proceeding.
- B. Do not place concrete during rain without adequate protection.

- C. The Contractor shall conform to ACI 306R when mixing and placing concrete during cold weather. Provide sufficient protection when daily temperatures drop below 40 degrees F.
- D. The Contractor shall conform to ACI 305R when mixing and placing concrete during hot weather. When air temperature exceeds 100 degrees F adjust concrete mix with retarding admixture in design mix, and adequately test and take additional measures as directed by concrete supplier.
- E. The Contractor shall maintain access for vehicular and pedestrian traffic as required for other construction activities. Use temporary striping, flagmen, barricades, warning signs, and warning lights as required.
- F. Placing in hot weather: Comply with ACI 305R. Concrete shall be delivered, placed and finished in a sufficiently short period of time to avoid surface dry checking.
 - 1. Concrete shall not exceed 85 degrees F at time of placement.
 - 2. Concrete shall be kept wet continuously after tempering until implementation of curing compound procedure in accordance with this specification.
 - 3. Evaporation Retarder: Apply evaporation retarder to concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 pounds per square foot per hour, before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.
- G. Placing in Cold Weather: Comply with ACI 306R. Protect from frost or freezing. No antifreeze admixtures are permitted.
 - 1. When placing concrete during freezing or near-freezing weather, mix shall have temperature of at least 50 degrees F but not more than 90 degrees F.
 - 2. Concrete shall be maintained at temperature of at least 50 degrees F for not less than 72 hours after placing or until it has thoroughly hardened.
 - 3. Provide necessary thermal coverings for any flat work exposed to freezing temperatures.

PART 2 - PRODUCTS

2.1 DESIGN AND PERFORMANCE CRITERIA

- A. Contractor shall comply with requirements applicable to this Section for concrete materials, admixtures, bonding materials, curing materials, surface sealers and others as required.
- B. Concrete walking surfaces shall have a coefficient of friction not less than 0.30 and will be subject to testing to verify compliance as specified in Article FIELD QUALITY CONTROL.
 - 1. The coefficient of friction will be measured by California Test 342 before pavement is opened to public traffic, but not sooner than 7 days after concrete placement.

2. Contractor shall notify the Architect and Project Inspector of pavement having a coefficient of friction less than 0.30.
- C. Sustainable Design:
1. VOC emissions for field-applied adhesives, sealants, and sealant primers must comply with limits specified in Section 01 6116.
 2. VOC emissions for field-applied paints and coatings must comply with limits specified in Section 01 6116.

2.2 FORMING MATERIALS

- A. Form Material: Steel, wood, or other suitable material of size and strength to resist movement during concrete placement and to retain horizontal and vertical alignment until removal. Use straight forms, free of distortion and defects. Use flexible spring steel forms or laminated boards to form radius bends as required. The forms shall be of a depth equal to the depth of curbing or sidewalk, and so designed as to permit secure fastening together at the tops. Coat forms with non-staining type coating that will not discolor or deface surface of concrete.
1. Concrete Exposed to View: 5/8-inch minimum APA B-B Plyform, steel or "Sonotube" forms by Sunoco, 888-875-8754, or equal.
 2. Concrete Concealed from View: 5/8-inch minimum APA B-B Plyform, steel or 1 x 8 DF, Number 2 Grade or better.
- B. Form Ties: Snap off metal of fixed length, leaving no metal within 1-1/2 inches of surface and no fractures, spalls or other surface defects larger than 1 inch diameter; manufactured by Burke, Dayton Superior, or equal.
- C. Spreaders: Metal. Wood is not permitted.
- D. Form Coating: Coat forms with non-staining material that will not discolor or deface surface of concrete or leave any residue on concrete that would interfere with surface coating as approved by the Architect.
- E. Chamfer Strips: Rigid polyvinyl chloride, 3/4-inch x 3/4-inch, in maximum possible lengths, manufactured by Burke, Greenstreak, Vulco, or equal.

2.3 REINFORCING MATERIALS

- A. Reinforcement Bars: New billet steel deformed bars conforming to requirements of ASTM A615/A615M or ASTM A706/A706M; Grade 60.
1. Bars for dowels installed through expansion joints or construction joints to existing sidewalks or concrete features shall be smooth or if deformed shall be sleeved on one end for slippage.
- B. Reinforcing Supports: Galvanized metal chairs or spacers or metal hangers, accurately placed 3 feet on center each way, staggered, with each support securely fastened to steel reinforcement in place.

1. Bottom bars in footings may be supported with 3-inch concrete blocks with embedded wire ties.
2. Concrete supports without wire ties will not be allowed.

2.4 CONCRETE MATERIALS

- A. Cement: Portland cement in accordance with ASTM C150/C150M, Type II, low alkali.
- B. Concrete Aggregates: Graded from coarse to fine in accordance with ASTM C33/C33M.
 1. Normal Weight Aggregates: Clean and free from deleterious coatings, clay balls, roots, and other extraneous materials, and in conformance with ASTM C33/C33M, except as otherwise specified. Combined grading shall meet limits of ASTM C33/C33M.
 - a. Size: Not be larger than one-fifth of the narrowest dimension between forms, or larger than three-fourths of the minimum clear spacing between reinforcing bars.
 2. Lightweight Aggregates:
 - a. General: Durable particles suitably processed, washed and screened without adherent coatings, free of materials with deleterious reactivity to alkali in cement, and conforming to ASTM C330/C330M.
 - b. Fine aggregate shall be natural sand, or sand prepared from stone or gravel, with grains free of silt, loam and clay.
- C. Water: Potable, clean, and in accordance with ASTM C94/C94M, free from injurious amounts of oil, acids, alkalis, salts, scale, organic materials or other deleterious matter, and in compliance with ACI 318 Section 26.4.1.3.
- D. Fly Ash: Western Fly Ash, conforming to ASTM C618 for Class N or Class F materials and in accordance with CBC Section 1903A.6.
 1. Class C is not permitted.
 2. Proportions: Not more than 15 percent (by weight) may be substituted for portland cement.

2.5 ADMIXTURES

- A. Water Reducing Admixture: Admixture to improve placing, reduce water cement ratio and ultimate shrinkage; "WRDA 64" by GCP Applied Technologies, or equal conforming to ASTM C494/C494M and ACI 318 Section 3.6.
 1. Water reducing admixture may be used subject to prior approval by the Architect, Engineer, and the Testing Lab.
 2. Proposed product and quantity shall be included in original design mix.
- B. Air-Entraining Admixture: "Daravair 1000" by GCP Applied Technologies or equal conforming to ASTM C260 and ACI 318, section 26.4.1.4.
 1. Proportion air entraining concrete to attain specified minimum 28-day compressive strength.

2. Total air entrainment in concrete shall be not less than 4 percent or more than 6 percent of the volume of concrete.
- C. Glare Reduction Colorant: Concentrated pigment dispersions designed to permanently color concrete; "Chromix L10 Base-Black" by Sika Corporation, or equal. *Was within 2.2 H.1*

2.6 CURING MATERIALS

- A. Clear Curing Compound: Water-based membrane-forming concrete curing compound in accordance with ASTM C309 and C1315; "Aqua Resin Cure Clear" by Burke CO, "1100" by W.R. Meadows, or equal.

2.7 ADDITIONAL MATERIALS AND COMPONENTS

- A. Concrete Bonding Agent: The following, or equal, conforming to ASTM C1059/C1059M.
 1. "Weld-Crete" by Larson Products Corporation, 800-633-6668.
 2. "Daraweld C" by GCP Applied Technologies, 877-423-6491.
- B. Patching Mortar: One-component, trowel applied, migrating-corrosion-inhibitor enhanced, polymer-modified, shrinkage-compensated, fiber reinforced, micro-silica enhanced, cementitious repair mortar for horizontal, vertical, and overhead applications; "Meadow-Crete GPS" by W.R. Meadows, or equal.
- C. Non-Shrink Grout: Premixed, non-metallic, no chlorides, non-staining and non-shrinking conforming to ASTM C1107/C1107M; "MasterFlow 713" by Master Builders Solutions, a division of BASF, 800-433-9517, or equal.
- D. Drainage Rock Base: 3/4-inch aggregate size conforming to Class 2 Aggregate Base as defined in Caltrans Standard Specifications Section 26, or equal clean free-draining gravel or crushed rock as recommended by the Geotechnical Engineer.
- E. Expansion Joint Material: Preformed 3/8-inch fiber material, with bituminous binder manufactured for use as concrete expansion joint material and conforming to ASTM D1751 and approved by Architect.
 1. Furnish joint fillers in one-piece lengths for full width being placed, wherever possible. Where more than one length is required, lace or clip joint-filler sections together.
- F. Joint Sealant for Expansion Joints in Concrete: Weather and UV resistant, single component, cold applied silicone sealant, Type S, conforming to ASTM D5893/D5893M; ASTM C920, Grade P, Class 25, Use T.
 1. Self-Leveling: "DOWSIL 890-SL Silicone Joint Sealant" by Dow Chemical Company, or equal.
 2. At Slopes Exceeding 5 Percent: Non-sagging; "DOWSIL 888 Silicone Joint Sealant" by Dow Chemical Company, or equal.
 3. Color: As standard with manufacturer.

- G. Pre-Formed Plastic Expansion Joint Caps: Polystyrene, with removable tops; "Snap Cap" by W. R. Meadows, Tex-Trude expansion caps, or equal.
- H. Truncated Domes: Vitrified Polymer Composite (VPC) cast-in-place detectable/tactile warning surface tiles complying with Americans with Disabilities Act (ADA) and the California Code of Regulations (CCR) Title 24, Part 2, Chapter 11B; "Armor-Tile", "Access Tile Tactile Systems," or equal.
 - 1. Color: Shall be yellow and approximate 33538 of GSA/SAE AMS-STD-595A in accordance with CBC Section 11B-705.1.1.3.1.
- I. Traffic Paint for Accessibility Striping at Stairs: VOC compliant, water-based, vinyl acrylic copolymer fast drying emulsion and specifically formulated as a traffic marking paint; "Setfast" with "Duckback" abrasive additive by Sherwin-Williams, "SAFE-STRIDE" by Wooster Products, Inc., or equal.
 - 1. Colors: As selected by Architect. [Yellow]
- J. Cast Abrasive Accessibility Strips and Stairs: Extruded aluminum with integral anchor and filled with abrasive granules in epoxy binder; Model ST-SF-N by Nystrom, Inc., 800-547-2635, Type T-24 by American Safety Tread Company, Inc., 800-245-4881, Type WP-24A by Wooster Products, Inc., 330-264-2844, or equal.
 - 1. Colors: As selected by Architect. [Yellow]

2.8 CONCRETE DESIGN AND CLASS

- A. Designed Strength and Classes of Concrete: The following mixes are not applicable to concrete items exceeding 4 feet in height above the adjacent grade.
 - 1. Class "B": Concrete shall have 1 inch maximum size aggregate, shall have 3000 pounds per square inch minimum at 28 day strength with a maximum water to cementitious ratio no greater than 0.50.
 - a. Location of Use: Exterior slabs, including walks, vehicular paved surfaces, manhole bases, poured-in-place drop inlets, curbs, valley gutters, curb and gutter, and other concrete of like nature.
 - 2. Class "D" concrete of 1 inch maximum size aggregate shall have 3500 pounds per square inch 28 day strength with a maximum water to cementitious materials ratio of 0.55.
 - a. Location of Use: Footings and retaining walls not attached to buildings, and planter walls, monument signs, and other site concrete not described for use in Class "B".
- B. Slump Limits: Provide concrete, at point of final discharge of proper consistency as tested in accordance with ASTM C143/C143M with slumps of 4 inches, plus or minus 1 inch.
- C. Mix Design: Concrete shall be designed for strength in accordance with provisions of CBC Section 1905A.

1. Should the Contractor desire to pump concrete, a modified mix design will need to be submitted for review.
 2. Fly ash may be used in concrete to improve workability in amounts up to 15 percent of the total cementitious weight.
- D. Air Entrainment: Provide at concrete paving / flatwork, including concrete ramps and stairs in accordance with local jurisdiction minimum requirements, but no less than 3 percent of the volume of concrete.
- E. Glare Reduction Additive:
1. General:
 - a. Provide at exterior concrete slabs, walks, ramps, stairs, including bleachers, and other exposed flatwork to eliminate glare.
 - b. Omit glare reduction colorant where color hardener, integral color, and stain treatment of concrete are scheduled.
 2. Quantity: As required to match approved sample but not exceed 2 pounds of colorant per cubic yard of concrete.
 3. Add colorant to mix in accordance with manufacturer's printed instructions.
- F. Coloring Agent:
1. Quantity: Add pigment as required to result in hardened concrete color consistent with approved sample but not exceeding maximum dosage per sack of cement as recommended by manufacturer based on total cementitious materials of mix design.
 2. Add pre-mixed colorant bags to mix in accordance with manufacturer's printed instructions.

2.9 MIXING OF CONCRETE

- A. Conform to requirements of CBC Chapter 19A.
- B. Concrete shall be mixed until there is uniform distribution of material and mass is uniform and homogenous; mixer must be discharged completely before the mixer is recharged.
- C. Concrete shall be Ready-Mixed Concrete: Mix and deliver in accordance with the requirements set forth in ASTM C94/C94M and ACI 301. Batch Plant inspection may be waived in accordance with CBC Section 1705A.3.3, when approved by the Project Engineer and DSA.
1. Furnish batch certificates for each batch discharged and used in the work.
 2. Approved Testing Laboratory shall check the first batching at the start of the work and furnish mix proportions to the Licensed Weighmaster.
 3. Licensed Weighmaster shall identify materials as to quantity and to certify to each load by ticket.
 4. Delivery tickets are to accompany each truck and shall be kept in the job superintendent's file. Delivery tickets must indicate the following information or be subject to rejection:

- a. Name of Project.
 - b. Supplier of concrete.
 - c. Truck identity and ticket serial number.
 - d. Date of delivery.
 - e. Brand of cement.
 - f. Cement content.
 - g. Strength classification.
 - h. Batching time.
 - i. Point of deposit.
 - j. Total amount of water.
 - k. Weight of aggregate.
 - l. Daily temperature.
 - m. Number of cubic yards in load.
 - n. Admixture content.
 - o. Name of Contractor.
 - p. Name of driver.
 - q. Time loaded and first mixing of concrete.
 - r. Reading of revolution counter.
 - s. Color additive.
5. Ticket shall be transmitted to Project Inspector by truck driver with load identified thereon. Project Inspector will not accept load without load ticket identifying mix and will keep daily record of pours, identifying each truck, its load and time of receipt, and will transmit two copies of record to DSA.
6. At end of project, Weighmaster shall furnish affidavit to DSA on form satisfactory to DSA, certifying that all concrete furnished is in conformance with proportions established by mix designs.
7. Placement of concrete shall occur as rapidly as possible after batching and in a manner which will assure that the required quality of the concrete is maintained. In no case may concrete be placed more than 90 minutes from batch time.
- a. When air temperature is between 85 and 90 degrees F, reduce maximum batching to discharge time from 90 minutes to 75 minutes.
 - b. When air temperature is above 90 degrees F, reduce maximum batching to discharge time to 60 minutes.
8. Water may be added to the mix only if neither the maximum permissible water-cement ratio nor the maximum slump is exceeded.
- a. The quantity of water used for each batch shall be accurately measured.
 - b. In no case shall more than 10 gallons of water be added to a full 9-yard load, or 1 gallon per yard on remaining concrete within the drum, providing load tag indicates at time of mixing at plant an allowance for additional water.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Confirm general layout, grade, and joint pattern layout with the Architect prior to placing concrete.
- B. Verify that gradients and elevations of the base are correct, and that the base is dry.
- C. Contractor shall report in writing to the Architect prevailing conditions that will adversely affect satisfactory execution of the work of this Section.
 - 1. Do not proceed with work until unsatisfactory conditions have been corrected.
- D. Forms and reinforcements are subject to approval by the Project Inspector as specified in Article FIELD QUALITY CONTROL.

3.2 PREPARATION

- A. Remove frost, water, and other foreign materials from form surfaces, reinforcement, and embedded items against which concrete will be placed.
- B. When the ambient temperature necessitates the use of cold or hot weather concreting, make provisions in advance of concrete placement.
- C. Before placing concrete, clean tools and equipment, and remove debris from areas to receive concrete.
- D. Clean reinforcing and other embedded items of coatings, oil, mud and soil that may impair bond with concrete.
- E. Slab-On-Grade: After subgrade has been approved by Geotechnical Engineer, install specified drainage rock base material to thickness shown. Rock base shall be implemented and compacted in accordance with the Geotechnical Report and recommendations of the Geotechnical Engineer.

3.3 INSTALLATION – FORMWORK

- A. Form material shall be straight, true, sound and able to withstand deformation due to loading and effects of moist curing. Materials which have warped or delaminated, or require more than minor patching of contact surfaces, shall not be reused.
- B. Build forms to shapes, lines, grades and dimensions indicated. Construct formwork to maintain tolerances required by ACI 301. Forms shall be substantial, tight to prevent leakage of concrete, and properly braced and tied together to maintain position and shape. Butt joints tightly and locate on solid backing. Chamfer corners where indicated. Form bevels, grooves and recesses to neat, straight lines. Construct forms for easy removal without hammering, wedging or prying against concrete.
- C. Space clamps, ties, hangers and other form accessories so that working capacities are not exceeded by loads imposed from concrete or concreting operations.

- D. Build openings into vertical forms at regular intervals if necessary to facilitate concrete placement, and at bottoms of forms to permit cleaning and inspection.
- E. Build in securely braced temporary bulkheads, keyed as required, at planned locations of construction joints.
- F. Before placement of reinforcing steel, coat faces of all forms to prevent absorption of moisture from concrete and to facilitate removal of forms. Apply specified material in conformance with manufacturer's written directions.
 - 1. Seal all cut edges.
 - 2. Before re-using form material, inspect, clean thoroughly, and recoat.
- G. Slope tie-wires downward to outside of wall.
- H. Brace, anchor and support all cast-in items to prevent displacement or distortion.
- I. During and immediately after concrete placing, tighten forms, posts and shores. Readjust to maintain grades, levels and camber.
- J. Concrete Paving, Curbs, Curb and Gutters, Ramps:
 - 1. Expansion Joints: Install at locations indicated, and so that maximum distance between joints is 20 feet for exterior concrete unless otherwise shown. Expansion joint material shall be full depth of concrete section. Recess for snap cap and sealant when required.
 - 2. Curbs, Valley Gutter, and Curb & Gutter: Install expansion joints at 60 feet on center, except when placing adjacent to concrete walks, the expansion joints shall align with the expansion joints shown for the concrete walks. Expansion joint material shall be full depth of concrete section. Recess for snap cap and sealant when required.
 - 3. Isolation Joints: 3/8-inch felt between walls and exterior slabs or walks so that paved areas are isolated from all vertical features, unless specifically noted otherwise on plans.
 - 4. Exterior Concrete Paving: Install expansion joints at 20 feet on center maximum, both directions, unless shown otherwise on plans.
 - 5. Ramps: Whether shown or not, all ramps shall have control joints and expansion joints.
 - a. Control joints on ramps shall be aligned and placed in between the vertical posts for the handrails. The curbs, if required shall have control joints that align with the handrail posts.
 - b. Expansion joints shall be placed at the upper, intermediate, and bottom landings.
- K. Inspection: Refer to Article FIELD QUALITY CONTROL.

3.4 INSTALLATION – REINFORCING

- A. General: Reinforcing shall be accurately placed at locations indicated on the drawings within required tolerances and providing required clearances. Reinforcement shall be

secured prior to placement of concrete such that tolerances and clearances are maintained. Coverage shall be in accordance with Section 1907A.7 of the CBC.

1. Reinforcement must be in place before concreting is begun.
 2. Keep a person on the job to maintain position of reinforcing as concrete is placed.
 3. All expansion and construction joints in concrete shall have dowels of size and spacing as shown on the Drawings, or as approved by Architect.
 4. Give notice whenever pipes, conduits, sleeves, and other construction interferes with placement; obtain method of procedure to resolve interferences.
- B. Additional reinforcing steel shall be placed around all utility boxes, valve boxes, manhole frames and covers that are located within the concrete placements.
1. The bars shall be placed so that there will be a minimum of 1-1/2-inch clearance and a maximum of 3-inch clearance. The reinforcing steel shall be placed mid-depth of concrete slab.
- C. At right angles or intersections of concrete walks, additional 2 feet x 2 feet #5, 90 degree bars shall be added at all inside corners for additional crack control. The bars shall be placed 2 inches from concrete forms and supports, at mid-depth of slab.
- D. Reinforcing steel shall be adequately supported by approved devices on centers close enough to prevent any sagging.
- E. Placing Tolerances:
1. In accordance with ACI 301 or CRSI/WCRSI Recommended Practice for Placing Reinforcing Bars, unless otherwise shown.
 2. Clear distance between parallel bars in a layer shall be no less than 1 inch, the maximum bar diameter shall not exceed 1-1/2 times the maximum size of coarse aggregate.
- F. Splices:
1. General: Unless otherwise shown on drawings, splice top reinforcing at midspan between supports, splice bottom reinforcing at supports, and stagger splices. Bar laps shall be wired together. Reinforcing steel laps shall be as follows:
 - a. Length of Lap Splices in Concrete:
 - 1) No. 4 bar: 24 inches minimum.
 - 2) No. 5 Bar: Not less than 62 bar diameters.
 - 3) No. 6 Bar: 56 inches minimum.
 - 4) No. 7 Bars and Larger: Not less than 93 bar diameters.
 - b. All splices shall be staggered at 5 feet minimum from adjacent splices.
- G. Inspection: Refer to Article FIELD QUALITY CONTROL.

3.5 PLACING OF CONCRETE – GENERAL

- A. Adjacent finish surfaces shall be protected at all times during the concrete pour and finishing. Verify that all formwork is tight and leak-proof before concrete is poured. Finish work defaced during the concrete pour and finishing shall be replaced at no extra cost to Owner.
- B. Remove wood chips, sawdust, dirt, loose concrete and other debris just before concrete is to be poured. Use compressed air for inaccessible areas. Remove all standing water from excavations.
- C. Transport concrete from mixer to place of final deposit as rapidly as practicable by methods which will prevent separation or loss of ingredients. Deposit as close as practicable in final position to avoid re-handling or flowing. Partially hardened concrete must not be deposited in work. Concrete shall not be wheeled directly on top of reinforcing steel.
- D. Keep excavations free of standing water, but moisture condition sub-grade before concrete placement.
- E. Placing: Once started, continue concrete pour continuously until section is complete between predetermined construction joints. Prevent splashing of concrete onto adjacent forms or reinforcement and remove such accumulation of hardened or partially hardened concrete from forms or reinforcement before work proceeds in that area. Free fall of concrete shall not to exceed 4'-0" in height. If necessary, provide lower openings in forms to inject concrete and to reduce fall height.
- F. Remove form spreaders as placing of concrete progresses.
- G. Place footings as monolithic and in one continuous pour.
- H. Compacting: Concrete shall be compacted by mechanical vibrators.
 - 1. Concrete shall be thoroughly worked around reinforcement and embedded fixtures and into corners of forms.
 - 2. Vibrating shall not be applied to concrete which has already begun to initially set or be continued so long as to cause segregation of materials.

3.6 REMOVAL OF FORMS

- A. Remove without damage to concrete surfaces.
 - 1. Sequence and timing of form removal shall insure complete safety of concrete structure.
 - 2. Forms shall remain in place for not less than the following periods of time. These periods represent cumulative number of days during which temperature of air in contact with concrete is 60 degrees F and above.
 - a. Vertical Forms of Foundations, Walls and All Other Forms Not Covered Below: 5 days.
 - b. Concrete Paving Edge Screeds or Forms: 7 days.

3. Concrete shall not be subjected to superimposed loads (structure or construction equipment) until it has attained its full design strength and not for a period of at least 21 days after placing. Concrete systems shall not be subjected to construction loads in excess of design loads.
- B. Patching: Install specified patching mortar per manufacturer's recommendations. Repairs to defective concrete which affect the strength of any structural concrete member or component are subject to approval by the architect and DSA.

3.7 CONCRETE PAVING

- A. Concrete paving shall be formed and finished to required line and grades true and flat with a maximum tolerance of 1/8-inch in 10 feet for flatness and to slopes indicated.
- B. Concrete vibrator shall be used to assist concrete placement. Contractor shall have spare concrete vibrator on site during concrete placement.
- C. Thoroughly water and soak the subgrade of exterior concrete paving, curbs, curb and gutters, with multiple daily waterings for at least three days or as required to achieve required moisture content prior to the concrete pour in order to place the subgrade soils in full expansion.
 1. Provide damming as required to keep standing water within the formed area and to allow for proper saturation and full expansion of the subgrade soils.
 2. Remove standing water before concrete placement.
- D. Construction Joints:
 1. Keep exposed concrete face of construction joints continuously moist from time of initial set until placing of concrete; thoroughly clean contact surface by chipping entire surface not earlier than 5 days after initial pour to expose clean hard aggregate solidly embedded, or by approved method that will assure equal bond, such as green cutting.
 2. If contact surface becomes contaminated with soil, sawdust or other foreign matter, clean entire surface and re-chip entire surface to assure proper adhesion.

3.8 FINISHING

- A. Concrete Paving: Finish surface as required by ACI 302.1R using manual and vibrating screeds to place concrete level and smooth.
 1. Under no circumstances shall water be added to the top surface of freshly placed concrete.
 2. Use "jitterbugs" or other special tools designed for the purpose of forcing the course aggregate below the surface leaving a thick layer of mortar 1 inch in thickness.
 3. After tamping the concrete, wood float surface to a true and even plane.
 4. After floating with a wood bull float, make 2 passes with a steel Fresno trowel to start sealing the concrete surface.

5. While concrete is still wet but sufficiently hardened to bear a persons' weight on knee boards, start troweling with a steel hand trowel or a machine trowel in larger areas. Use sufficient pressure to bring moisture to surface.
 6. After surface moisture has disappeared, finish concrete utilizing steel, hand or power trowel.
 7. Completed surface shall be free from trowel marks, depressions, ridges or other blemishes. Tolerance for flatness shall be 1/8-inch in 10 feet.
 8. Provide final finish as follows, unless otherwise indicated:
 - a. Medium Broom Finish: Typical finish to be used at all exterior walks, stairs and ramps. Brooming direction shall run perpendicular to slope to form non-slip surface.
- B. Curb Finish: Steel trowel.
- C. Joints and Edges:
1. Mark-off exposed joints, where indicated, with 1/4-inch radius x 1 inch deep jointer or edging tool. Joints shall be clean, cut straight and parallel or square with respect to concrete walk edge.
 2. Tool edges of control joints, walk edges, and wherever concrete walk adjoins other material or vertical surfaces. Expansion joints shall be constructed as detailed on plans.
 3. The expansion joints shall be full depth as shown in the Drawings. Failure to do so will result in non-compliance and shall be immediately machine cut by the Contractor at its expense.

3.9 CURING

- A. Formed Concrete:
1. Keep forms and top on concrete between forms continuously wet until removal of forms, 7 days minimum.
 2. Maintain exposed concrete in a continuous wet condition for 14 days following removal of forms.
- B. Concrete Paving, Curb, Curb and Gutter, Valley Gutter:
1. Cure utilizing curing compound. If applicable, the Contractor shall verify that the approved curing compound is compatible with the approved colorant system.
 2. Curing compound shall be applied in a wet puddling application. Spotty applications shall be reason for rejection and possibly concrete removal and replacement at the contractor's expense with no compensation from the Owner.
- C. No curing compound shall be applied to areas scheduled to receive resilient track surface including, curbs, ramps, runways, and similar items.

3.10 DEFECTIVE CONCRETE

- A. General:

1. Determination of defective concrete shall be made by the Architect or Engineer whose opinion shall be final in identifying areas to be replaced, repaired or patched.
2. As directed by Architect, cut out and replace defective concrete.
 - a. Defective concrete shall be removed from the site.
 - b. No patching is to be done until surfaces have been examined by Architect and permission to begin patching has been provided.
 - c. Permission to patch an area shall not be considered waiver of right by the Owner to require removal of defective work, if patching does not, in opinion of Architect, satisfactorily restore quality and appearance of surface.
 - d. Remove and replace concrete if repair to an acceptable condition is not feasible.

B. Defective Concrete Is:

1. Concrete that does not match the approved mix design for the given installation type.
2. Concrete not meeting specified 28-day strength.
3. Concrete which contains rock pockets, voids, spalls, transverse cracks, exposed reinforcing, or other such defects which adversely affect strength, durability or appearance.
4. Concrete which is incorrectly formed, out of alignment or not plumb or level, or outside of the maximum tolerance for flatness and slopes indicated.
5. Concrete containing embedded wood or debris.
6. Concrete having large or excessive patched voids which were not completed under Architect's direction.
7. Concrete not containing required embedded items.
8. Concrete with excessive shrinkage, transverse cracking, crazing, curling; or defective finish.
9. Concrete that is unsuitable for placement or has set in truck drum for longer than 90 minutes from the time it was batched.
10. Concrete where expansion joint filler that is not isolating the full depth of the concrete section, and not recessed as required for backer rod and sealant where required.
11. Concrete that is excessively wet or excessively dry and will not meet the minimum or maximum slump required per mix design.
12. Finished concrete with oil stains from equipment use, and or rust spots that cannot be removed.
13. Concrete with control joints (weakened planed joints) that do not meet the required minimum depth shown on the drawings.
14. Concrete not meeting slip-resistance requirements.

C. Flatwork: The Owner reserves the right to survey the flatwork, to determine if flatwork is outside of the maximum tolerance for flatness and slopes as indicated.

1. If the flatwork is found to be out of tolerance, then the Contractor is required to replace concrete at no additional expense to the Owner.
2. Determination of flatwork flatness, surveying and remedial work must be completed far enough in advance so that the project schedule is maintained, delays are avoided, and the new flatwork or flatwork repairs are properly cured.
3. The Contractor will be responsible for reimbursing the Owner for costs associated with re-surveying to verify compliance of work remediated by the Contractor.

3.11 SEALANT

- A. Apply sealant in compliance with manufacturer's instructions, using hand guns or pressure equipment with proper nozzle size, on clean, dry, properly prepared substrates.
- B. Force sealants into joint against sides of joint to make uniform. Avoid pulling of the sealant from the sides. Fill sealant space completely with sealant.
- C. Finished joints shall be straight, uniform, smooth, and neatly finished.
- D. Remove any excess sealant from adjacent surfaces of joints utilizing the manufacturer's recommended solvent and cleaning processes. Leave the work in a neat, clean condition.

3.12 FIELD QUALITY CONTROL

- A. Inspection of Forms and Reinforcing:
 1. Approval of forms and reinforcing steel must be received from Project Inspector prior to pouring concrete.
 2. Notice of readiness to place first pour shall be given to Project Inspector, DSA, Architect, and Engineer not less than 48 hours prior to placement of concrete to allow for inspection.
 3. Pouring of concrete shall not proceed prior to completing requested adjustments to forms and reinforcing and without approval of Project Inspector.
- B. Testing of Concrete:
 1. Frequency and Samples for Testing:
 - a. Four identical cylinder samples for strength tests of each class of concrete placed each day shall be taken not less than once a day, or not less than once for each 50 cubic yards of concrete, or not less than once for each 2,000 square feet of surface area for slabs or walls.
 - b. In addition, samples for strength tests for each class of concrete shall be taken for seven-day tests at the beginning of the concrete work or whenever the mix or aggregate is changed.
 2. Testing:
 - a. Slump: Each truck's concrete shall be tested for slump before concrete is placed.
 - b. Strength:

- 1) Tests for strength will be conducted by Testing Agency on one cylinder at 7 days and two cylinders at 28 days. The fourth remaining cylinder will be available for testing at 56 days if the 28-day cylinder test results do not meet the required design strength.
 - 2) On a given project, if the total volume of concrete is such that the frequency of specified testing would provide less than five strength tests for a given class of concrete, tests shall be made from at least five randomly selected batches or from each batch if fewer than five batches are used.
- C. Slip-Resistance Testing: Owner's Testing Agency will perform testing on flatwork to verify compliance with specified slip-resistance.
1. The coefficient of friction will be measured by California Test 342 before pavement is opened to public traffic, but not sooner than 7 days after concrete placement
 2. Where paving is determined to have a coefficient of friction less than 0.30, Contractor is to repair and/or replace these surfaces at no cost to Owner.

3.13 CLEANING

- A. Upon completion of work of this Section promptly remove from the working area all scraps, debris and surplus material of this Section.
- B. Clean excess material from surface of all concrete walks and utility structures.
- C. Power wash concrete surfaces to remove stains, dried mud, tire marks, and rust spots.
- D. Comply with any additional requirements of additive manufacturer for colored concrete.

3.14 PROTECTION

- A. Graffiti-resistant Coating:
 1. Surface Preparation: Prepare concrete surface to receive graffiti-resistant coating specified in Section 09 9623, Graffiti-Resistant Coatings, where indicated.
 2. Concrete must be clean, dry, and free of efflorescence and dust.
- B. Protect work and materials of this Section prior to and during installation, and protect the installed work and materials of other trades.
- C. In the event of damage during construction, make all repairs and replacements necessary to the approval of the Architect, at no additional cost to the Owner.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Chain link fences
 - 2. Gates and gate hardware.

1.2 RELATED REQUIREMENTS

- A. Section 01 6116, Volatile Organic Compound (VOC) Restrictions, for VOC limits pertaining to adhesives, sealants, fillers, primers, and coatings.
- B. Section 01 8113, Sustainable Design Requirements, for CAL-Green general requirements and procedures.
- C. Section 32 1600, Site Concrete.
- D. Section 08 7100, Door Hardware, for padlocks.

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CAL Green), edition as noted on the drawings, as adopted by the California Division of the State Architect (DSA).
- C. Chain Link Fence Manufacturers' Institute (CLFMI):
 - 1. Products Manual.
- D. ASTM International (ASTM):
 - 1. A153: Zinc Coating (Hot Dip) on Iron and Steel Products.
 - 2. A392: Zinc Coated Steel Chain Link Fence Fabric.
 - 3. A653/A653M: Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
 - 4. A780/A 780M: Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings.
 - 5. C33/C33M: Standard Specification for Concrete Aggregates.
 - 6. C94: Ready-mixed Concrete.
 - 7. C150/C150M: Standard Specification for Portland Cement.
 - 8. F668: Poly Vinyl Chloride (PVC) Coated Steel Chain Link Fence Fabric.
 - 9. F934: Standard Colors for Poly Vinyl Chloride (PVC) Coated Chain Link.
 - 10. F969: Standard Practice for Construction of Chain-Link Tennis Court Fence.

CHAIN LINK FENCES AND GATES
SECTION 32 3113
3595001

11. F1083: Pipe, Steel, Hot-Dipped Zinc Coated (Galvanized) Welded, for Fence Structures.

1.4 ADMINISTRATIVE REQUIREMENTS

A. Submittal Procedures:

1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
3. Sustainable Design Submittals shall comply with the additional requirement of Section 01 8113, Sustainable Design Requirements.

1.5 ACTION SUBMITTALS

- A. Shop Drawings: Submit showing all parts, connections and anchorages, adjacent materials, fully dimensioned and noted. Indicate plan layout, spacing of components, post foundation dimensions, hardware anchorage and schedule of components.
- B. Products Data: Submit list and complete descriptive data of all products proposed for use. Include manufacturer's specifications, published warranty or guarantee, installation instructions, and maintenance instructions.
- C. Samples:
1. Chain-link fabric, approximately 12 inches square, in selected color.
 2. Hardware and fittings if requested by Architect.

1.6 INFORMATIONAL SUBMITTALS

- A. Sample of manufacturer's warranty.
- B. Sustainable Design:
1. General:
 - a. Submit information necessary to establish and document compliance with the California Green Building Standards Code.
 - b. Sustainable design submittals are in addition to other submittals.
 2. The following information shall be provided:
 - a. Paints and Coatings: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.

1.7 CLOSEOUT SUBMITTALS

- A. Warranty/Guarantee: Submit executed warranty and Subcontractor's guarantee.

1.8 QUALITY ASSURANCE

- A. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.
- B. Use materials and products of one manufacturer whenever possible.
- C. All materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.

1.9 DELIVERY, STORAGE AND HANDLING

- A. Deliver undamaged products to job in manufacturer's sealed containers and/or original bundles with tags and labels intact.
- B. Store materials in protected, dry conditions off of ground and in areas so as to not interfere with the progress of the work.
- C. Transport, store and handle in strict accord with the manufacturer's written recommendations.

1.10 FIELD CONDITIONS

- A. Make and be responsible for all field dimensions necessary for proper fitting and completion of work. Report discrepancies to Architect before proceeding.

1.11 WARRANTY

- A. Manufacturer: In addition to the Contractor's and Subcontractor's Guarantee, furnish Owner with manufacturer's fully executed written warranty for chain link fencing against defects in materials and workmanship, including the following:
 - 1. Windscreen: 3 years.

PART 2 - PRODUCTS

2.1 DESIGN AND PERFORMANCE CRITERIA

- A. Industry Standards: Materials and installation shall conform to the requirements of the Chain Link Fence Manufacturers Institute (CLFMI) "Product Manual."
- B. Regulatory Requirements: Pedestrian gates and related hardware shall comply with applicable codes, including provisions for accessibility required by CBC and the Americans with Disabilities Act "Designs for Accessible Design." Comply with the most stringent.
- C. Use new components **[,except existing fence indicated to be relocated,]** free from defects affecting service and appearance.
- D. Sizes specified or shown are minimum.

CHAIN LINK FENCES AND GATES

SECTION 32 3113

3595001

- E. Provide ferrous material except as otherwise indicated or specified.
- F. Sustainable Design:
 - 1. VOC emissions for field-applied paints and coatings must comply with limits specified in Section 01 6116.

2.2 WORKMANSHIP

- A. Galvanizing: Hot dip galvanize ferrous materials after fabrication. Repair zinc coating damaged in shop or during field erection by re-coating with hot repair compound, Re Galv, Galvalloy, Galveweld-alloy, or equal, applied in accord with manufacturer's recommendations.

2.3 MATERIALS

- A. Vinyl Coated Chain Link Fabric: Steel wire with no less than 1.20 ounce of zinc coating per square foot of surface area, covered with color coating of polyvinyl chloride no less than 15 mils thick fusion method with breaking strength of 1200 pounds (Class 2b), and complying with ASTM F668.
 - 1. Typical:
 - a. Wire Diameter: 9 gage, coated size.
 - b. Mesh Opening: 2 inches.
 - 2. Edges: Knuckle fabric at bottom and at top selvage.
 - 3. Fabric widths shall be one piece.
 - 4. Color of PVC Coating: In compliance with ASTM F934, black.
- B. Security Fabric: 16 gauge galvanized sheet metal in conformance with ASTM A653/A653M, 1.3 pounds per square foot, with round hole perforations; McNichols item number 1431141638 as specified and the basis of design, or equal.
 - 1. Perforations shall be 3/16" holes on a 1/4" stagger.
 - 2. Open Area: 51 percent.
 - 3. Finish: Prime and paint as specified in Section 09 9100, Painting, prior to installation.
- C. Security Fabric U-Edging: 14 gauge. galvanized hot rolled U shaped edging, 1 inch tall face x 3/8 inch opening width; McNichols quality U-Edging, item number 4003801410 as specified and the basis of design, or equal.
- D. Round Steel Pipe Fence Framework:
 - 1. Round steel pipe and rail, Schedule 40 standard weight pipe, in accordance with ASTM F1083, 1.8 oz/sq. ft (550 g/sq. m) hot dip galvanized zinc exterior and 1.8 oz/sq. ft (550 g/sq. m) hot dip galvanized zinc interior coating.
 - a. Regular Grade: Minimum steel yield strength 30,000 psi (205 MPa)
 - b. High Strength Grade: Minimum yield strength 50,000 psi (344 MPa)

- E. Line Posts:
 - 1. Without Slats or Windscreen: Regular Grade.
 - a. To 8'-0" High Maximum: 2-3/8 inch outside diameter pipe at 3.65 pounds per linear foot.
- F. End, Corner and Pull Posts: End, corner and pull posts shall also comply with gate post requirements, where occurs.
 - 1. Without Slats or Windscreen: Regular Strength.
 - a. To 8'-0" High Maximum: 2-7/8 inch outside diameter pipe at 5.79 pounds per linear foot.
- G. Gate Posts, Single Leaf: Gate posts shall also comply with End, Corner and Pull Post requirements.
 - 1. To 6 Feet Wide: 2-7/8 inch outside diameter pipe at 5.79 pounds per linear foot.
- H. Post caps: Cast or malleable iron ball or acorn shape; with opening for top rail.
- I. Top Rail, Bottom Rails, and Braces: 1-5/8" outside diameter pipe at 2.27 pounds per linear foot., or 1-5/8 inch x 1-1/4 inch roll formed section, 14 gauge.
 - 1. Brace Assembly:
 - a. Equally spaced between top rail and bottom fabric selvage and run from end, gate, or corner post to first line posts with suitable malleable iron fittings.
 - b. Truss from line post to end, gate, or corner post with 3/8 inch round rod.
- J. Coating for Fencing Components, Including Posts: Polyester powder coating, 3 to 4 mils thick, applied by the electrostatic spray process and baked at 450-500 degrees until cured; with 55 to 70 gloss.
 - 1. Color: Black.
- K. Bands: 14 gauge x 1 inch wide steel spaced 15 inches on center. for securing stretcher bars to end and gate posts.
 - 1. Bands may be used in conjunction with special fitting for securing rails to end and gate posts.
 - 2. Chamfer to ease projecting edges of bands.

2.4 GATES

- A. Frames:
 - 1. Gate Leaves to 6 Feet Wide: 1-5/8 inch outside diameter pipe at 2.27 pounds per linear foot.
 - 2. Gate Leaves Over 6 Feet Wide: 2 inch outside diameter pipe at 2.72 pounds per linear foot.

CHAIN LINK FENCES AND GATES

SECTION 32 3113

3595001

3. Provide additional horizontal and vertical pipe or tube as necessary to assure proper gate operation and attachment of fabric and hardware.
- B. Diagonal Bracing: Provide adjustable length 3/8 inch truss rods on non-welded gate frames and welded gate frames where corner rigidity is insufficient to insure no sag.
- C. Fabric: As specified for fence.
- D. Gate Assembly:
 1. Weld or assemble gate frame with malleable or pressed steel fittings and rivets to provide rigid connections.
 2. Install fabric with stretcher bars at vertical edges, which may also be used at top and bottom edges.
 3. Securely attach stretcher bars and fabric to frame on all sides at 15 inches on center.
 4. Attach hardware with rivets or by other means which will provide security against removal.
- E. Gate Hardware:
 1. General: Hardware at disabled accessible gates shall meet accessibility, including mounting, of the ADA and CBC. Comply with the most stringent.
 2. Hinges: Malleable iron, pressed or forged steel, non-liftoff type, easy noiseless operation and long wear, offset to permit 180 degree gate opening.
 - a. Provide 1-1/2 pair hinges for each leaf over 6 feet nominal height.
 - b. Ball and socket hinges not acceptable.
 3. Fork Latch: Malleable iron, drop fork latch which permits operation of the gate from either side, with padlock eye provided as integral part of latch.
 4. Panic / Lever Hardware: At gates to receive panic hardware or lever locksets, provide galvanized iron lockset boxes, backing plates or mounting plates as required for permanent, vandal resistant mounting.
 5. Kick Plates: 10 inches tall x width of gate x 14 gauge minimum, smooth uninterrupted surfaced, galvanized steel.
 - a. Mount on the bottom edge of gate at the push side. Mount on both sides at two-way swing gates.
 - b. Bottom edge of plate shall be not more than 3 inches above the top of the walk.
 - c. Plate shall be welded to the fence frame and shall allow the gate to be opened by a wheelchair footrest without creating a trap or hazardous condition.
 - d. Provide at pedestrian gates that are within the disabled accessible path of travel
 6. Gate Stop and Holder: Malleable iron.
 - a. Stop shall automatically engages gate frame and holds it in open position.
 - b. Provide at vehicle gates.

7. Double Gates: Provide cane bolt and ground set keeper with locking device and padlock eyes designed as integral part of latch, requiring one padlock for locking both leaves.

2.5 ADDITIONAL MATERIALS AND COMPONENTS

- A. Galvanizing Repair: Zinc coating damaged in shop or during field erection shall be by re-coated using a hot repair compound; "Regalv" repair stick by Rotometals, San Leandro, CA, or equal, applied in accordance with manufacturer's recommendations.
- B. Concrete:
 1. Materials:
 - a. Portland cement, ASTM C 150.
 - b. Aggregate: ASTM C33.
 - c. Water: Potable and free from substances harmful to concrete.
 2. Mix materials to obtain low slump concrete with 28 day compressive strength of 2,500 psi.
 - a. Maximum Size Aggregate: 1-1/2 inch.
 - b. Re-tempering not permitted.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. General:
 1. Execute work in accord with best trade practice for industrial fence installations.
 2. Make welds neat and secure, grind off excess exposed metal.
 3. Securely set posts plumb in alignment at proper depth and height, and rigid bracing where needed; install fabric under tension and securely tie to posts, rails and braces.
 4. Gates shall move freely without sag.
- B. Setting Posts:
 1. General: Space posts as indicated but not more than 10 feet on center.
 2. Pour and tamp concrete leaving no voids.
 - a. Check posts for vertical and top alignment and hold in position.
 - b. Dome top of concrete and trowel smooth to shed water away from post.
 - c. Align posts in footings as follows:
 3. Without Slats or Windscreen: Footings for End, corner and pull posts shall also comply with gate post requirements, where occurs.
 - a. Line Posts to 8'-0" High Maximum: 1'-0" diameter, 3'-3" minimum embedment.

CHAIN LINK FENCES AND GATES

SECTION 32 3113

3595001

- b. End, Corner and Pull Posts to 8'-0" High Maximum: 1'-0" diameter, 4'-3" minimum embedment.
- 4. Single Leaf Gates: Footings for gate posts shall also comply with End, Corner and Pull Post requirements.
 - a. To 6 Feet Wide: 12 inch diameter, 36 inch embedment.
- C. Where posts occur adjacent to structures or other work where concrete foundations may conflict with post footing, block out to allow post installation or use off-set post. Hold post 4 inches clear from face of structure.
- D. Fabric: Leave about 1-1/2 inches between ground and bottom barbs.
 - 1. Pull fabric taut and tie to posts, rails **[and tension wires]**.
 - 2. Install fabric on security side of fence.
 - 3. Fabric shall remain under tension after pulling force is released.
- E. Gates:
 - 1. Install gates plumb, level and secure, with full swing or slide without interference.
 - 2. Install ground set items in substantial concrete mass for adequate anchorage.
- F. Tie Wires:
 - 1. Install with one tight turn to hold fabric firmly to frame.
 - 2. Bend ends of wire inward to prevent hazard to persons or apparel.
- G. Fasteners:
 - 1. Install nuts for tension band and hardware bolts on side of fence opposite fabric side.
 - 2. Spoil ends of bolts to prevent removal of nuts.

3.2 ADJUSTING

- A. Repair exposed zinc coatings damaged in shop or during field erection using specified repair system and in compliance with ASTM A 780,
- B. Adjust gated hardware for smooth operation and lubricate where necessary.

END OF SECTION

*p:\sacramento\3595 tracy unified school district\001-000_villalovoz es new shade structures\08 specifications\06 spec\04 final\bohn\32 3113_chain link fences and gates.docx
Last Updated: February 25, 2022*

PART 1 - GENERAL

1.1 SUMMARY

A. Scope of Work:

1. Furnish all labor, materials, tools, equipment, and transportation required to perform and complete the installation of an automatic sprinkler irrigation system, including all piping, sprinkler heads, controls, connections, testing, etc. as shown on the Drawings and as specified herein. The water source for this project is potable water.
2. Utilize and accept as standards manufacturer's recommendations and/or installation details for any information not specifically detailed on the Drawings.

1.2 RELATED REQUIREMENTS

- A. Section 01 6116, Volatile Organic Compound (VOC) Restrictions, for VOC limits pertaining to adhesives, sealants, fillers, primers, and coatings.
- B. Section 01 8113, Sustainable Design Requirements, for CAL-Green general requirements and procedures.
- C. Section 31 0000, Earthwork.
- D. Section 31 2333, Trenching and Backfilling.
- E. Section 32 9000, Landscaping.

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CALGreen), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).

1.4 ADMINISTRATIVE REQUIREMENTS

A. Submittal Procedures:

1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
3. Sustainable Design Submittals shall comply with the additional requirements of Section 01 8113, Sustainable Design Requirements

**IRRIGATION
SECTION 32 8000
3595001**

B. Pre-Installation Meeting:

1. Request and hold a pre-installation meeting prior to beginning the work of this Section. Parties required to be in attendance are the Landscape Contractor, Project Inspector, Owner's Representative, and the Landscape Architect.

1.5 ACTION SUBMITTALS

- A. Product names are used as standards; provide proof as to equality of any proposed material and do not use other materials or methods unless approved in writing by the Owner's Representative. Submit no more than one request for substitution for each item. The decision of the Owner's Representative is final.
- B. Use equipment capacities specified herein as the minimum acceptable standards.
- C. List materials in the order in which they appear in Specifications; include substitutions. Submit the list for approval by the Owner's Representative.
- D. Make any mechanical, electrical, or other changes required for installation of any approved, substituted equipment to satisfaction of Owner's Representative and without additional cost to Owner. Approval by Owner's Representative of substituted equipment and/or dimensional drawing does not waive these requirements.
- E. Do not construe approval of material as authorization for any deviations from Specifications unless attention of Owner's Representative has been directed to specified deviations.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data for the following:
 1. For landscape contractor.
- B. Sample of manufacturers' warranty.
- C. Record of Pre-Installation Meeting.
- D. Sustainable Design:
 1. General:
 - a. Submit information necessary to establish and document compliance with the California Green Building Standards Code.
 - b. Sustainable design submittals are in addition to other submittals.
 2. The following information shall be provided:
 - a. Adhesives and Sealants: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.
 - b. Paints and Coatings: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.

1.7 CLOSEOUT SUBMITTALS

- A. Warranty/Guarantee: Submit executed warranty and subcontractor's guarantee.
- B. Maintenance and Operating Instructions:
 - 1. Furnish operating maintenance instructions bound in a hardback binder and indexed. Start compiling data upon approval of list of materials. Do not request final inspection until booklets are approved by Owner's Representative.
 - 2. Incorporate the following information in these sets:
 - a. Complete operating instructions for each item of irrigation equipment.
 - b. Typewritten maintenance instructions for each item of irrigation equipment.
 - c. Manufacturer's bulletins which explain installation, service, replacement parts, and maintenance.
 - d. Service telephone numbers and/or addresses posted in an appropriate place as designated by Owner's Representative.
- C. Record Drawings.

1.8 QUALITY ASSURANCE

- A. Qualifications: Work must be complete by a licensed Landscape Contractor. Provide proof of five years' continuous experience in landscaping and irrigation of projects of similar size.
- B. Certification: Ensure that the contractor installing the Central Control System is trained and certified in the installation of the Central Control System. The training and certification must have been completed within two years prior to the installation date.
- C. Work Force: Ensure that an experienced foreman is present at all times during installation. Keep the same foreman and workers on the job from commencement to completion.
- D. Reviews: Specifically request reviews of all items listed in Article INSPECTION REQUIREMENTS, prior to progressing to the next level of work.
- E. Standards:
 - 1. Provide work and material in full accordance with the rules and regulations of the National Electric Code; the Uniform Plumbing Code; and other applicable state or local laws or regulations.
 - 2. Furnish, without extra charge, additional material and labor required to comply with these rules and regulations, though the work may not be specifically indicated in the Specifications or Drawings.
 - 3. Where the Specification requirements exceed those of the above-mentioned codes and regulations, comply with the requirements in the Specifications.

**IRRIGATION
SECTION 32 8000
3595001**

1.9 DELIVERY, STORAGE AND HANDLING

- A. Transport, store and handle in strict conformance with the manufacturer's written recommendations.
- B. Deliver undamaged products to job in manufacturer's sealed containers and/or original bundles, with tags and labels intact. All material containers or certificates shall be clearly marked by manufacturer as to contents for inspection.
- C. Store materials in original undamaged packages and containers, inside well-ventilated area protected from weather, moisture, soilage, extreme temperatures, and humidity. Lay flat, blocked off ground.
- D. Use all means necessary to protect irrigation system materials before, during, and after installation and to protect related work and material.
- E. Handle plastic pipe carefully, especially protecting it from prolonged exposure to sunlight. Store pipe on beds that are the full length of the pipe, and keep pipe flat.

1.10 FIELD CONDITIONS

- A. Information on Drawings relative to existing conditions is approximate. During progress of construction, make deviations necessary to conform to actual conditions, as approved by Owner's Representative, without additional cost to Owner. Accept responsibility for any damage caused to existing services. Promptly notify Owner's Representative if services are found which are not shown on Drawings.
- B. Protect existing trees-to-remain as specified in "Existing Tree Protection" in Article PREPARATION, in Part 3 of this Section.
- C. Protect existing utilities within construction area. Repair damages to utility lines that occur as a result of operations of this work.
- D. Verify dimensions at building site and check existing conditions before beginning work. Make changes necessary to install work in harmony with other crafts after receiving approval by Owner's Representative.

1.11 INSPECTION REQUIREMENTS

- A. Obtain verification from Project Inspector for the following at the appropriate times during construction and prior to further progression of work in this Section:
 - 1. Pressure testing of all mainlines and lateral lines (See "Hydrostatic Tests – Open Trench" in Article FIELD QUALITY CONTROL, in Part 3 of this Section),
 - 2. Trench depth,
 - 3. Sleeves under pavement,
 - 4. Flushing of all mainlines and lateral lines,
 - 5. Backfill and pipe bedding,

6. Layout of heads,
 7. Operation of system and coverage adjustments (with Landscape Architect) after system is fully automated and operational, backfill of trenching is completed, and surface has been restored to original grades.
- B. In case of failure to obtain any verification by the Project Inspector as required above, remove and replace work as necessary to obtain the verification at no additional cost to the Owner.

1.12 WARRANTY AND GUARANTEE

- A. Manufacturer: In addition to the Contractor's and Subcontractor's Guarantee, furnish Owner with manufacturer's available fully executed written warranty against defects in materials and workmanship.
- B. Subcontractor Guarantee: Shall include damage by leaks and settlement of irrigation trenches.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Use materials as specified; any deviation from the Specifications must first be approved by the Owner's Representative in writing.

2.2 DESIGN AND PERFORMANCE CRITERIA

- A. Sustainable Design:
1. VOC emissions for field-applied adhesives, sealants, and sealant primers must comply with limits specified in Section 01 6116.
 2. VOC emissions for field-applied paints and coatings must comply with limits specified in Section 01 6116.

2.3 MATERIALS

- A. Automatic Control Valves: As indicated on Drawings.
- B. Gate Valve: As indicated on Drawings.
- C. Pipe and Fittings:
1. PVC pipe: As indicated on Drawings.
 2. PVC fittings three-inch (3") size and smaller: High impact, standard weight, Schedule 40, molded PVC as manufactured by George Fischer, Lasco, Spears, or approved equal.

IRRIGATION
SECTION 32 8000
3595001

3. PVC fittings four-inch (4") size and larger: High impact, standard weight, Class 200 gasketed, molded PVC as manufactured by George Fischer, Lasco, Spears, or approved equal.
 4. All plastic pipe and fittings: Continuously and permanently marked with manufacturer's name, type of material, IPS size, schedule, NSF approval, and code number.
 5. Threaded PVC pipe and nipples: IPS Schedule 80 when necessary to use threaded connections to gauges, valves, or control valves. Threaded adapters may be used in place of nipples when making pipe to valve connections.
 6. Use 45-degree fittings for changes in depth of pipe, and at transition from main line to automatic control valves.
 7. Piping above ground: Schedule 40 galvanized steel with cast-iron fittings.
- D. PVC Primer: Weld-On P-70 Purple Primer or approved equal.
- E. PVC Glue: Weld-On 711 Gray heavy bodied PVC Cement or approved equal.
- F. Sprinkler Heads: As indicated on Drawings.
- G. Quick Coupler Valves: As indicated on Drawings.
- H. Sleeves: As indicated on Drawings.
- I. All Valve Boxes and Covers: Manufactured, green with "Irrigation – Non-Potable" permanently embossed on cover. Carson, Rainbird or approved equal.
- J. Reduced Pressure Backflow Preventer: As indicated on Drawings.
- K. Automatic Sprinkler Control Wire:
1. Connections between remote control valves and controller: UF-14 direct burial polyethylene (PE) insulated wire, Paige Electric P7079D or approved equal. Common wire to be white, and lead wire to be colored. If multiple controllers are used, a different color is to be used for each controller's lead wire. (Use red for the first controller). Spare wires are to be yellow.
 2. UL Listed waterproof sealing pack for wire connections: 3M DBR/Y-6, or approved equal.
 3. Provide adequate working space around electrical equipment in compliance with local codes and ordinances.
 4. Electrical, other than low voltage, such as power wiring, conduit, fuses, thermal overloads and disconnect switches, is included under Division 26 of these Specifications.
- L. Unions And Flanges:
1. Steel unions and flanges two inches (2") and smaller: 150 lb. screwed black (brass to iron seat) or galvanized malleable iron (ground joint).

2. Steel unions and flanges two and one-half inches (2 ½") and larger: 150 lb. black flange union, flat-faced, full gasket.
 3. Gaskets: One-sixteenth inch (1/16") thick rubber Garlock No. 122, Johns-Manville or approved equal.
 4. Flange Bolts: Open-hearth bolt steel, square heads with cold pressed hexagonal nuts, cadmium plated in ground. Provide copper-plated steel bolts and nuts or brass bolts and nuts for brass flanges.
- M. Sand for Trench Backfill: Natural sand, free of roots, bark, sticks, rags, or other extraneous material

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Prior to commencement of the work of this Section, obtain written verification from the project Civil Engineer that the rough grade in landscape areas is in conformance with Section 31 0000 - Earthwork.
- B. Examine conditions of work in place before beginning work; report defects.

3.2 PREPARATION

- A. Scheduling: Notify the Project Inspector prior to commencing and/or continuing the work of this Section. Remove and replace, at no cost to Owner, any work required as a result of failure to give the appropriate notification.
- B. Measurements: Take field measurements; report variance between plan and field dimensions.
- C. Protection: Maintain warning signs, shoring and barricades as required. Prevent injury to, or defacement of, existing improvements. At no additional cost to Owner, repair or replace items damaged by installation operations.
- D. Existing Tree Protection:
 1. Avoid unnecessary root disturbance, compaction of soils within drip line, or limb breakage.
 2. Do not store material or dispose of any material other than clean water within the drip line.
 3. Provide adequate irrigation during construction.
 4. Replace any tree damaged during construction with a tree of equal size and value at no additional cost to Owner.
 5. Adjust trench locations in field to minimize damage to existing elements and plant roots of trees-to-remain at no additional cost to Owner.

IRRIGATION
SECTION 32 8000
3595001

- E. Surface Preparation: Prior to beginning sprinkler irrigation work, complete placement of topsoil as specified in Section 31 0000 – Earthwork. Notify Project Inspector of irregularities if any.

3.3 AUTOMATIC CONTROLLER

- A. Connect automatic control valves to controller(s) in sequence as shown on Drawings.
- B. Install all exposed wires to a minimum of twenty-four inches (24") beyond controller within a UL approved rigid conduit.

3.4 GRADING

- A. Install all irrigation features to their finished grade and at depths indicated. Complete and /or accommodate all rough grading and/or finish grading before commencing with trenching.

3.5 LAYOUT

- A. Lay out work as accurately as possible to Drawings. Drawings are generally diagrammatic to extent that swing joint offsets and fittings are not shown. Record all changes on the Record Drawings.
- B. Do not willfully install the irrigation system as shown on Drawings when it is obvious, in the field, that obstructions or other discrepancies exist which may not have been considered in the design. Notify Owner's Representative of discrepancies before proceeding.

3.6 EXCAVATING AND TRENCHING

- A. General: Perform excavations as required for installation of work included under this Section, including shoring of earth banks to prevent cave-ins. Restore surfaces, existing underground installations, etc., damaged or cut as result of this work to their original condition and in a manner approved by the Landscape Architect.
- B. Width:
 - 1. Make trenches wide enough to allow a minimum of six inches (6") between parallel pipelines and three inches (3") between side of pipe and side of trench. Do not allow stacking of pipe within trench.
 - 2. Allow a minimum clearance of twelve inches (12") in any direction from parallel pipes of other trades.
- C. Preparation of Excavations: Remove rubbish and rocks from trenches. Bed pipe on a minimum of three inches (3") of clean, rock-free soil to provide a firm, uniform bearing for entire length of pipeline. If clean, rock-free soil is not available, use sand for pipe bedding. See Backfill and Compacting for the remainder of the trench backfill.

- D. Minimum depth of cover: Unless shown otherwise, provide the following minimums:
 - 1. Mainline: twenty-four inches (24") cover.
 - 2. Lateral line: twelve inches (12") cover for spray heads, and eighteen inches (18") cover for rotor heads.
- E. Conflicts with other trades:
 - 1. Hand-excavate trenches where potential conflict with other underground utilities exist.
 - 2. Where other utilities interfere with irrigation trenching and piping work, adjust the trench depth as instructed by Owner's Representative.

3.7 BACKFILL AND COMPACTING

- A. General: Do not begin until hydrostatic tests are completed and when system is operating and after required tests and inspections have been made.
- B. Backfill directly around the pipe: Cover pipe with a minimum of three inches (3") of clean, rock-free soil. If clean, rock-free soil is not available, use sand for three inches (3") of backfill above the pipe. The remainder of the trench backfill material can be native soil or material described below. Do not allow wedging or blocking of pipe.
- C. For backfill of trenches under paving areas:
 - 1. See Section 31 0000 – Earthwork for compaction rates and material
 - 2. See Section 31 2333 – Trenching and Backfilling for trench backfill procedure.
- D. For backfill of trenches in landscape areas:
 - 1. Place backfill in six-inch (6") layers and compact with an acceptable mechanical compactor.
 - 2. Compact backfill material in landscape areas to eighty-five percent (85%) maximum dry density of the soil.
 - 3. If settlement occurs along trenches, make adjustments in pipes, valves, and sprinkler heads, soil, sod or paving as necessary to bring the system, soil, sod or paving to the proper level or the permanent grade, without additional cost to the Owner.
- E. Excess Soil: Remove all rocks, debris, and excess soil that results from sprinkler irrigation trenching operations, landscape planting, and soil preparation operations off site at no additional cost to the Owner. If soil meets topsoil requirements in Section 31 0000 – Earthwork, it may be used for finish grading.
- F. Finishing: Dress-off areas to eliminate construction scars.

**IRRIGATION
SECTION 32 8000
3595001**

3.8 CONTROL WIRES

- A. General: Install control wires beneath sprinkler main line whenever possible; tape wires to mainline pipe. Provide one spare wire for each controller.
- B. Slack Wire: Provide eighteen inches (18") of slack wire for each wire connected to automatic control valve. Slack wire shall be coiled and left in the valve box. Tape wires in bundles every ten feet (10'); do not tape wires in sleeves.
- C. Expansion and Contraction: Snake wire in trench to allow for contraction of wire.
- D. Wire Passing Under Existing or Future Paving or Construction: Encase in PVC Schedule 40 or galvanized steel conduit extending at least twelve inches (12") beyond edges of paving or construction.
- E. Wire Connections: Install wire connections in a waterproof sealing pack.
- F. Wire Splicing: Permit splicing only on runs exceeding 500 feet. Locate all splices within valve boxes.
- G. Wire Termination: Install wire in a valve box with eighteen inches (18") of slack wire coiled and individually capped with approved waterproof sealing pack.
- H. Spare Wire: Install two (2) spare wires along each wire path. If there is more than one wire path from the controller, the contractor to install two (2) spare wires per path. Provide eighteen inches (18") of slack wire at each automatic control valve.

3.9 FLUSHING LINES

- A. Thoroughly flush lines prior to installing valves, performing hydrostatic testing, or installing sprinklers. Divert water to prevent washouts.

3.10 AUTOMATIC CONTROL AND QUICK COUPLER VALVES

- A. Install where shown and where practical; place no closer than twelve inches (12") to walk edges, building walls, or fences. Refer to detail for example.
- B. Thoroughly flush mainline before installing valve.
- C. Install valves in ground cover areas where possible.

3.11 PIPING

- A. General: Install in conformance with reference standards, manufacturer's written directions, as shown on Drawings and as herein specified.
- B. Workmanship:
 - 1. General: Install sprinkler irrigation equipment in planted areas throughout the site.
 - 2. Coordination: Organize location of sleeves with other trades as required.

C. Pipe Line Assembly:

1. General:
 - a. Cutting: Cut pipe square; remove rough edges or burrs.
 - b. Solvent-welded Connections: Use materials and methods recommended by the pipe manufacturer.
 - c. Brushes: Use non-synthetic brushes to apply solvents and primer.
 - d. Cleaning: Clean pipe and fittings of dirt, moisture, and debris prior to applying solvent or primer.
 - e. Assembly: Allow pipe to be assembled and welded on the surface or in the trench.
 - f. Expansion and Contraction: Snake pipe from side to side of trench to allow for expansion and contraction.
 - g. Location: Locate pipes as shown on Drawings except where existing supply valves, utilities or obstructions prohibit or where slight changes are approved to better suit field conditions.
2. Flexible Elastometric Seal Joints:
 - a. General: Assemble in strict conformance with the pipe manufacturer's instruction.
 - b. Rubber Rings: Use rubber rings specific for water service systems.
 - c. Cleaning: Thoroughly clean ring and groove of dirt, moisture and debris using a clean, dry cloth. Do not use solvents, lubricants, cleaning fluids or other material for cleaning.
 - d. Seating: Properly seat ring in groove.
 - e. Spigot:
 - 1) General: Clean spigot-end of pipe as in "Cleaning" above prior to applying lubricant recommended by pipe manufacturer.
 - 2) Seating: Insert spigot into bell and seat to full depth required.
3. Connections:
 - a. Threaded Plastic Pipe Connection:
 - 1) Use Teflon tape or pipe joint compound.
 - 2) When assembling to threaded pipe, take up joint no more than one full turn beyond hand-tight.
 - b. Metal Valves and Plastic Pipe: Use threaded plastic male adapters.
 - c. Metal to Metal Connections:
 - 1) Use specific joint compound or gasket material for type of joint made. Where pipe of dissimilar metals are connected, use dielectric fittings.
 - 2) Where assembling, do not allow more than three full threads to show when joint is made up.
 - d. Where assembling soft metal (brass or copper) or plastic pipe, use strap-type friction wrench only; do not use a metal-jawed wrench.
 - e. Threading:

**IRRIGATION
SECTION 32 8000
3595001**

- 1) Do not permit the use of field-threading of plastic pipe or fittings. Use only factory-formed threads.
 - 2) Use factory-made nipples wherever possible. Permit the use of field-cut threads in metallic pipe only where absolutely necessary. When field-threading, cut threads accurately on axis with sharp dies.
 - 3) Use pipe joint compound for all threaded joints. Apply compound to male thread only.
4. Sleeves and conduits:
- a. Use sleeves of adequate size to accommodate retrieval for repair of wiring or piping and extend a minimum of twelve inches (12") beyond edges of walls or paving.
 - b. Provide removable, non-decaying plug at end of sleeve to prevent entrance of soil.
5. Unions: Locate unions for easy removal of equipment or valve.
6. Capping: Plug or seal opening as lines are installed to prevent entrance materials that would obstruct pipe. Leave in place until removal is necessary for completion of installation.

3.12 SPRINKLER HEADS

- A. Sprinkler heads: Locate as shown on the Drawings except where existing conditions prohibit, or slight changes are approved to achieve as good or better coverage under the same conditions. Do not allow sprinkler head spacing to exceed the maximum shown on the Drawings. Plumb heads.
- B. Handling, Assembly of Pipe, Fittings, and Accessories: Allow only skilled tradesmen to handle and assemble pipe, fittings and equipment. Keep interior of pipes, fittings and accessories clean at all times. Close ends of pipe immediately after installation; leave closure in place until removal is necessary for completion of installation. Do not permit bending of pipe.
- C. Flushing: Remove end heads and operate system at full pressure until all rust, scale, and sand is removed. Divert water to prevent ponding or damage to finished work.
- D. Coverage: Accept responsibility for full and complete coverage of irrigated areas to satisfaction of Landscape Architect and make necessary adjustments to better suit field conditions at no additional costs to Owner.

3.13 FIELD QUALITY CONTROL

- A. Visual Inspection: Verify that all pipe is homogenous throughout and free from visual cracks, holes, or foreign materials. Inspect each length of pipe. All materials are subject to impact test at the discretion of the Landscape Architect.

B. Hydrostatic Tests – Open Trench:

1. Center-load piping with a small amount of backfill to prevent arching or slipping under pressure.
2. Request the presence of the Project Inspector in writing at least forty-eight hours in advance of testing.
3. At no additional cost to Owner, test in the presence of the Project Inspector.
4. Apply continuous static water pressure of 100 psi when welded plastic joints have cured at least twenty-four hours, and with the risers capped, as follows: test main lines and submains for four hours; test lateral lines for two hours.
5. Repair leaks resulting from tests; and repeat tests.
6. Test to determine that all sprinkler heads function according to manufacturer's data and give full coverage according to intent of Drawings. Replace any sprinklers not functioning as specified with ones that do, or otherwise correct system to provide satisfactory performance.

C. Continuity Testing: Test locating device and control wires for continuity prior to and after back-filling operations.

3.14 CLEAN-UP

- A. Remove debris resulting from work of this Section.**

3.15 ADJUSTMENTS AND MAINTENANCE

- A. Adjusting System:** Prior to acceptance, satisfactorily adjust and regulate entire system. Set watering schedule on controller appropriate to types of plants and season of year. Adjust remote control valves to operate sprinkler heads at optimum performance based on pressure and simultaneous demands through supply lines.
- B. System Layout:** Provide reduced prints of Record Document irrigation plans, laminated in four (4) mil. plastic, of size to fit controller door. Enlarge remote-control valve designations as necessary for legibility. Color-code areas covered by each station. Affix plans to inside of controller door.
- C. Instructions:** Upon completion of work, instruct maintenance personnel on operation and maintenance procedures for entire system.
- D. Flow Charts:** Record and prepare an accurate flow-rate chart for each automatic control valve.

3.16 RECORD DRAWINGS

- A. As specified in Section 01 3300, Submittal Procedures, and the following:**
1. Regularly update plans of the system and any changes made to the system throughout the project. Record all changes on this plan before trenches are back-filled.

IRRIGATION
SECTION 32 8000
3595001

2. Record complete as-built information and submit the Record Drawings to the Architect before applying for payment for work installed.
3. Show the following on the Record Drawings accurately to scale and dimensioned from two permanent points of reference:
 - a. and spares Distance of mainline from nearby hardscape.
 - b. Location of automatic control valves, quick couplers, and gate valves.
 - c. Location and size of all sleeves.
 - d. Location of automatic control wires.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Soil Preparation and Fertilization
 - 2. Planting
 - 3. Sodding
 - 4. Weed Control
 - 5. Mulch
 - 6. Clean-up
 - 7. Landscape Maintenance Period
- B. Work not included in this Section: Landscape elements such as concrete walks, fencing, outdoor lighting, rough grading, and clearing are not a part of this Section unless shown on the landscape Drawings.

1.2 RELATED REQUIREMENTS

- A. Section 01 8113, Sustainable Design Requirements, for CAL-Green **[and Collaborative for High Performance Schools (CHPS)]** general requirements and procedures.
- B. Section 31 0000, Earthwork.
- C. Section 32 8000, Irrigation

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CALGreen), edition as noted on the drawings, as adopted by the California Division of the State Architect (DSA).
- C. EPA - Federal Insecticide, Fungicide and Rodenticide Act.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Submittal Procedures:
 - 1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.

LANDSCAPING
SECTION 32 9000
3595001

2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
- B. Pre-Installation Meeting: Request and hold a pre-installation meeting prior to beginning the work of this Section. Parties required to be in attendance are the Landscape Contractor, Project Inspector, Owner's Representative, and Landscape Architect.
- C. Pre-scheduled On-site Project Meetings: Hold regularly-scheduled (monthly or bimonthly as determined by the Landscape Architect) on-site project meetings with the Landscape Architect, Project Inspector and Owner's Representative. Dates and times will be jointly agreed upon.

1.5 ACTION SUBMITTALS

- A. Plant Material: Within fifteen (15) days after award of contract, locate plant materials required for construction. Ensure that trees and shrubs are contract- grown from a certified nursery. Notify Owner's Representative of plant material "tied off" for review at selected nursery. If specified material is not obtainable, submit the following to Owner's Representative: proof of non-availability, proposal for use of equivalent material, photographs of alternative choices of plant material. Include clear, written description of type, size, condition, and general character of plant material.
- B. Data Sheets:
 1. Provide product data for each type of landscape material indicated in the Drawings and Specifications.
 2. Letter from the manufacturer stating that the soil amendment material submitted for use on this project has no metal fragments or foreign objects.
- C. Samples: Submit samples of the following materials to Landscape Architect for approval:
 1. Soil amendment: (3) one-quart zip-locked plastic bags.
 2. Bark Mulch: (3) one-quart zip-locked plastic bags.
 3. Imported Topsoil: (3) one-quart zip-locked plastic bags.
- D. Provide soils analysis reports prepared by a qualified soils laboratory in accordance with the Soils Testing Requirements under "Soil Testing" in Article SOIL TESTING, in Part 3 of this section.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For landscape contractor.
- B. Prior to planting, submit copies of all trucking or packaging tags for all soil amendment, fertilizer and other additives to Landscape Architect so the quantities can be verified.
- C. Record of Pre-Installation Meeting.

1.7 CLOSEOUT SUBMITTALS

- A. Guarantee: Submit Subcontractor's guarantee.
- B. Record Drawings.

1.8 QUALITY ASSURANCE

- A. Qualifications: Work must be completed by a licensed Landscape Contractor. Provide proof of five years of continuous experience in landscaping and irrigation of projects of similar size (+/- 20% of the construction cost) and scope for education campuses. Landscape Contractor to have a minimum of two projects either completed or in construction in the last five years.
- B. Work Force: Ensure that an experienced foreman is present at all times during installation. Keep the same foreman and workers on the job from commencement to completion.
- C. Reviews: Specifically request reviews of all items listed below in Article INSPECTION REQUIREMENTS prior to progressing to the next level of work. The Owner's Representative reserves the right to inspect and reject material, both at place of growth and at site, before and/or after planting, for compliance with requirements for name, variety, size and quality.
- D. Reference Standards: Meet or exceed Federal, State and County laws requiring inspection of all plants and planting materials for plant disease and insect control.
- E. Plant Material:
 - 1. Conform to the current edition of Horticultural Standards for quality of Number 1 grade nursery stock as adopted by the American Association of Nurserymen. Conform to sizes specified on plant legend. Select plants which have a natural shape and appearance.
 - 2. Select only plants that are true to name, and tag one of each bundle or lot with the name of the plant in accordance with the standards of practice of the American Association of Nurserymen. In all cases, botanical names shall take precedence over common names.
 - 3. Tag each plant of a patented variety with the variety and identification number, where applicable, as it is delivered to the job site.
 - 4. Select only plants which have been nursery-grown in accordance with good horticultural practices and which have been grown under climatic conditions similar to those in the locality of the project for at least one year.
 - 5. Select only plants which are typical of their species or variety; have normal habits of growth; are sound, healthy, vigorous, well-branched and densely-foliated when in leaf; are free of disease, insect pests, eggs or larvae; and have a healthy and well-developed root system.

LANDSCAPING
SECTION 32 9000
3595001

6. Select only container stock that has been grown in the containers in which delivered for at least six (6) months, but not over two (2) years. Provide samples to show that there are no root-bound conditions.
7. Do not use plants that are severely pruned or headed-back to meet size requirements.
8. Do not plant container-grown plants that have cracked or broken balls of earth when taken from the container. Remove canned stock carefully from cans after containers have been cut on two sides with tin snips or other approved cutter.
9. At any time prior to final acceptance, be prepared to replace any plants that are rejected by the Owner's Representative because of physical damage to the plant.
10. Do not remove container-grown stock from containers before time of planting.
11. Stake shrubs with one-inch by one-inch by eighteen-inch (1"x1"x18") stakes in such manner that the stakes are not visible, and tie to upright position if they lean and/or are not growing in a vertical position.
12. Furnish quantities necessary to complete the work as shown on the Drawings and, if necessary, make up for any discrepancies in the quantities given in the Plant List at no additional cost to Owner.

1.9 DELIVERY, STORAGE AND HANDLING

- A. Packaged Materials: Deliver packaged materials in original, unopened containers showing weight, certified analysis, name and address of manufacturer, and indication of conformance with state and federal laws if applicable.
- B. Coordinate a time for the Landscape Architect to inspect the plants upon their delivery to the project site.
- C. Bulk Materials:
 1. Do not dump or store bulk materials near structures, utilities, walkways or pavements, or on existing turf areas or plants.
 2. Provide erosion-control measures to prevent erosion or displacement of bulk materials, discharge of soil-bearing water runoff, and airborne dust reaching adjacent properties, water conveyance systems, or walkways.
 3. Accompany each delivery of bulk fertilizers and soil amendments with appropriate certificates.

1.10 FIELD CONDITIONS

- A. Planting Season Limits: Do not plant when grounds are wet or temperature is below 25° F. Do not proceed with any soil preparation and fertilization if all planting cannot be completed within Planting Season Limit.

1.11 INSPECTION REQUIREMENTS

- A. Landscape Architect reserves the right to examine and reject plant material both at place of growth and at site, before and after planting, for compliance with requirements of name, variety, size, and quality.
- B. Obtain verification from Project Inspector for the following at the appropriate times during construction and prior to further progression of work in this Section:
 - 1. Rough grading is to tolerances specified in Section 31 0000 – Earthwork.
 - 2. The placement of landscape backfill material is as specified in this Section.
 - 3. Prior to the commencement of planting operations specified in this Section, the coverage and operation of the sprinkler irrigation system are as specified in Section 32 8000 - IRRIGATION.
 - 4. Required Test: For each load of soil amendment delivered to the site, spread at least two cubic yards (2 cy) of material onto a paved surface approximately two inches (2") deep. Pass a magnetic rake over the material in two directions. If any metal is found, test the entire load in the same manner. Perform all testing in the presence of the Project Inspector.
 - 5. Soil amendments, fertilizer, and bark mulch and materials have been delivered to the site by the supplier, the invoices from the supplier indicate the project name and quantities delivered, and the Project Inspector has received copies of all such documents.
 - 6. Prior to planting, amendments and conditioners have been incorporated as per pre-planting recommendations, and planting areas have been made ready to receive planting.
- C. In case of failure to obtain any verification by the Project Inspector as required above, remove and replace work as necessary to obtain the verification at no additional cost to the Owner.

1.12 PROTECTION

- A. Provide protection for persons and property throughout progress of work. Use temporary barricades as required. Proceed with work in such manner as to minimize spread of dust and flying particles and to provide safe working conditions for personnel. Store materials and equipment where directed.
- B. Existing Construction: Execute work in an orderly and careful manner to protect paving, work of other trades, and other improvements.
- C. Existing Utilities: Provide protection for existing utilities within construction area. At no additional cost to Owner, repair any damages to utility lines that occur as a result of this work.

LANDSCAPING
SECTION 32 9000
3595001

- D. Landscaping: Protect landscape work and materials from damage due to landscape operations, operations by other contractors and trades, and trespassers. Maintain protection during installation and maintenance periods.

1.13 PLANTING SCHEDULE

- A. Install, establish, and maintain all lawn areas for a minimum of ninety (90) days prior to date of substantial completion. Coordinate schedule with other work and overall project schedule. Failure to install lawn areas by this date shall result in assessment of liquidated damages.
- B. Proceed with work in an orderly and timely manner to complete installation of landscaping within contract limits.

1.14 LANDSCAPE MAINTENANCE PERIOD REQUIREMENTS

- A. Beginning of Landscape Maintenance Period:
 - 1. General: Landscape Maintenance Period does not begin until all work is installed and either the sod has been placed, as determined by Landscape Architect, in writing.
 - 2. On-site Inspection: When all work is complete, request and hold a meeting to include the Landscape Architect, Project Inspector, Architect and Owner's Representative who must together authorize and determine the start date for the landscape maintenance period. Coordinate and give notice of the date and time of the on-site meeting to all parties at least forty-eight (48) hours in advance.
 - 3. Acceptability: In cases where the lawn has reached adequate fullness and germination in some areas but not all, and authorization has not been given to begin the maintenance period, proceed with mowing, trimming, spraying, etc., as necessary prior to the beginning of the maintenance period.
- B. Duration of Landscape Maintenance Period:
 - 1. The Landscape Maintenance Period shall continue for a minimum of ninety (90) calendar days. During this time, continuously maintain all areas involved until final acceptance of the work by the Owner's Representative. See Landscape Maintenance Period procedure in Article LANDSCAPE MAINTENANCE, in Part 3 of this Section.

1.15 GUARANTEE

- A. The guarantee period for lawn and plant material shall be the duration of the landscape maintenance period, from commencement until final acceptance of the work of this Section.
- B. During the guarantee period, repair and/or replace plants and lawn not in satisfactory growing condition, as determined by Owner's Representative, without additional cost to Owner. Plants are to be replaced in accordance with Article LANDSCAPE MAINTENANCE in Part 3 of this Section, using plants of the same kind and size specified in plant list.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Use material in new and perfect condition as specified. Any deviations or substitutions from the Specification and Drawings must first be approved by Owner's Representative in writing prior to use.

2.2 SOIL PREPARATION MATERIALS

- A. Topsoil: Fertile; friable; natural loam surface soil; reasonably free of subsoil, clay lumps, brush, weeds and other litter; and free of roots, stumps, stones/rocks, and other extraneous or toxic matter harmful to plant growth.
- B. Soil Amendment: One-percent nitrogen-impregnated bark product with a ninety-percent (90%) bark base and zero to one-quarter inch (0-1/4") particle size, or approved equivalent. Do not spread until testing requirements have been satisfied.
- C. Fertilizer/Soil Conditioner: Gro-Power Plus or approved equal.
- D. Fertilizer for Trees and Shrubs: Seven-gram Gro-Power Planting Tablets (12-8-8 NPK) or approved equal.
- E. Vitamin B-1: "Superthrive", "Liquinox Start", "Cal-Liquid", or approved equal.

2.3 MISCELLANEOUS LANDSCAPE MATERIALS

- A. Bark Mulch: Untreated, shredded cedar.
- B. Tree-staking System: As indicated on Drawings.
- C. Pre-Emergent Weed Control: Oxadiazon, "Treeflan", "Ronstar 2G", "Surflan" (Elano Products Company), or approved equal.

**LANDSCAPING
SECTION 32 9000
3595001**

2.4 PLANT MATERIAL:

- A. Nursery Plant Stock:
 - 1. As indicated on Drawings. Do not remove container-grown stock from containers until planting time. Plants shall be true to name.
 - 2. Healthy, shapely, well-rooted, not pot-bound, free from insect pests or plant diseases and properly "hardened off" before planting. Replace plants that are not alive or are not in satisfactory growing condition, as determined by the Landscape Architect, without additional cost to Owner. The Landscape Architect may reject plants before and/or after planting.
 - 3. Labeled. Label at least one tree and one shrub of each species with a securely-attached, waterproof tag bearing legible designation of botanical and common name.
- B. Lawn Sod: Eighty percent (80%) Perennial Ryegrass and twenty percent (20%) Kentucky Bluegrass.

PART 3 - EXECUTION

3.1 SITE CONDITIONS

- A. Examine the site, verify grade elevations, and observe conditions under which work is to be performed. Do not proceed with work until unsatisfactory conditions have been corrected in a manner acceptable to the Owner's Representative.
- B. Proceed with complete landscape work as rapidly as portions of the site become available, working within seasonal limitations for each kind of landscape work required.
- C. Determine location of underground utilities and perform work in a manner which will avoid possible damage. Hand-excavate, as required, to minimize possibility of damage to underground utilities. Maintain grade stakes set by others until removal is mutually agreed upon by parties concerned.
- D. When conditions detrimental to sod or plant growth are encountered, such as rubble fill, adverse drainage condition, or other obstructions, notify the Owner's Representative before planting.

3.2 SOIL TESTING

- A. Coordinate soil testing in an expeditious and timely manner as required for on-site topsoil materials. Contract with a soil laboratory and include cost of sampling and testing in contract price. Take one (1) sample for every 5,000 square feet of landscape area up to a maximum of six (6) samples under the direction of and in the presence of the Owner's Representative.

- B. Submit each sample, according to the quantity of soil required by testing laboratory, to a competent laboratory approved by the Owner's Representative.
- C. Provide analysis of soil samples for pH, salinity, ammonia, phosphate, potassium, calcium, magnesium, boron, and sodium levels. Provide appraisal of chemical properties, including particle size determination, and recommendations for types and quantities of amendments and fertilizers.

3.3 PREPARATION

- A. Clearing of Vegetation:
 - 1. If live perennial weeds exist on site at the beginning of work, spray with a non-selective systemic contact herbicide as recommended and applied by an approved licensed landscape pest control advisor and applicator. Leave sprayed plants intact for at least 15 days.
 - 2. Clear and remove existing weeds by mowing or grubbing off all plant parts at least one-quarter inch ($\frac{1}{4}$ ") inch below surface of soil over entire areas to be planted.
- B. Soil preparation:
 - 1. Loosen soil in all planting areas, and on slopes flatter than 3:1 gradient, to a depth of six to eight inches (6" - 8") below finish grade. All debris, foreign matter, and stones shall be removed prior to the placing of any fertilizers or conditioners. Soil preparation is for all shrub planting beds and sodded lawn areas.
 - 2. Conduct the required soil tests and instruct the lab to include a minimum of the following soil improvements in the recommendation on the soils report.
 - a. Soil Amendment: Two cubic yards (2 cy) per 1,000 square feet.
 - b. Gro-Power Plus: One hundred fifty pounds (150 lbs) per 1,000 square feet.
 - c. If the lab recommends less than six cubic yards (6 cy) of soil amendment, the excess bid amount shall be applied to the cost of any additional recommended soil improvements, or returned to the Owner as a credit
 - 3. Apply amendments as follows, using rates recommended by the soils testing laboratory (the rates of amendments shown below are for bidding purposes only):
 - a. Fertilizer/Soil Conditioner: Broadcast 150 pounds of Gro Power Plus per 1,000 square feet in all planting areas and rototill to a depth of six to eight inches (6" - 8"). Remove from the site any rock and debris brought to the surface by cultivations. "Cultipack" all areas to receive sod.
 - b. Apply soil amendment to all planting areas at the rate of six cubic yards (6 cy) per 1,000 sf and rototill into the top six to eight inches (6" – 8").
 - 4. Upon completion of finish grading, request an review and obtain approval of Landscape Architect prior to commencement of planting.

LANDSCAPING
SECTION 32 9000
3595001

C. Finish Grading for all Planting areas

1. Refer to Earthwork Specification Section for Rough Grading.
2. Grade to elevations and contours shown on Drawings. Fill low spots with landscape backfill material and grade to surface drain in manner indicated on Drawings.
3. Finish-grade so that the entire area within the contract lines has a natural and pleasing appearance as specified and as directed by Landscape Architect.
4. Adjust sprinkler heads one-half inch above finish grade in preparation to receive sod. Reset sprinkler heads flush to grade after turf has germinated.
5. Flag the sprinkler heads and valve markers.

D. Planting Pits for Trees:

1. Excavate pits with vertical sides and with bottom of excavation slightly raised at center to provide proper drainage.
2. Set container-grown stock in center of pit on earth pedestal. Separate roots and/or prune roots as directed by Landscape Architect. In hot weather, pre-wet pit. Loosen outside roots from sides and bottom of root ball. When set, place additional backfill around base and sides of root ball. Work each layer to settle backfill and eliminate voids and air pockets. Water after placing final layer of backfill.
3. Loosen hard subsoil in bottom of excavation. Extend excavation as required to insure proper drainage from plant pits.
4. Fill excavated planting pits with water to half the depth of pit. Pits should drain within four hours (4 hrs). If planting pits do not drain, notify Project Inspector immediately. Do not proceed with planting until Landscape Architect has resolved a method to provide drainage.

E. Planting Pits for Shrubs/Groundcover:

1. Excavate pits and trenches with vertical sides and with bottom of excavation slightly raised at center to provide proper drainage.
2. Loosen hard subsoil in bottom of excavation. Extend excavation as required to insure proper drainage from plant pits.
3. Fill excavated planting pits with water to half the depth of pit. Pits should drain within four hours (4 hrs). If planting pits do not drain, notify Project Inspector immediately. Do not proceed with planting until Landscape Architect has resolved a method to provide drainage.

3.4 PLANTING

A. Lawn Sod:

1. Cultivate all lawn areas to a depth of six inches (6"). If cultivation does not break lumps, pull a spike-toothed harrow over the area behind the tractor.
2. Give all lawn areas that are to be sodded a smooth finish to prevent pockets. Do not allow any abrupt changes of surface. Prior to installation of sod, roll the grade with a 200-pound water-ballast roller. Request that the lawn grade be inspected and approved by the Landscape Architect prior to sodding to determine its suitability for planting. Obtain such approval prior to commencing sodding operations.
3. Do not take heavy objects (except lawn rollers) over lawn areas after they have been prepared for planting.
4. Completely lay the sod within twelve hours (12 hrs) of delivery. Do not leave sod on pallets in the hot sun longer than necessary.
5. Unroll sod carefully. Lay sod tight without any visible open joints, and without overlapping; stagger end joints twelve inches (12") minimum. Do not stretch or overlap sod pieces. Do not place sod in pieces smaller than twenty-four inches (24") in length by width of roll.
6. When new sod is to match existing turf, cut the edge of the existing turf in a series of straight lines that will accept new sod rolls in full width of the sod roll. Make the transition of grade between existing turf and new sod to be seamless with no change in elevation.
7. Immediately after laying sod, roll lawn areas with a 200-pound water-ballast roller.
8. Trim sod to conform to lawn shapes designated in Drawings.
9. On slopes of six inches (6") per foot and steeper, lay sod perpendicular to slope and secure every row with wooden pegs at a maximum of two feet (2') on center. Drive pegs flush with soil portion of sod.
10. Ensure that finished appearance is that of one continuous lawn.
11. Do not lay whole lawn before watering. When a conveniently large area has been sodded, water lightly to prevent drying. Continue to lay sod and to water until installation is complete.
12. All sod areas must be approved by Landscape Architect.
13. Water the complete lawn surface thoroughly. Moisten soil at least eight inches (8") deep. Repeat sprinkling at regular intervals to keep sod moist at all times until rooted. After sod is established, decrease frequency and increase amount of water per application as necessary.

LANDSCAPING
SECTION 32 9000
3595001

B. Shrubs:

1. Lay out individual shrub locations and areas for multiple plantings. Stake the locations, outline the areas, and secure the Owner's Representative's acceptance before beginning the planting work. Make minor adjustments as requested.
2. Scarify root ball prior to planting. Plant in holes twice the diameter of the root ball and to a depth equal to the container's height. Place the shrub and/or groundcover so the top of the root ball is one inch (1") higher than the surrounding grade. Set container-grown stock in center of pit. In hot weather, pre-wet the pit. When set, place additional backfill around base and sides of root ball. Work each layer to settle backfill and eliminate voids and air pockets. Thoroughly compact lower half of backfill in plant pit. See staking or guying detail. Water after planting. Provide a berm or watering basin for each tree. Add Vitamin B-1, in the proper solution as recommended by the manufacturer, to the second watering of the basin.
3. Place fertilizer planting tablets in root zone and alongside each plant. Follow manufacturer's instructions for number of tablets to use for each container size.
4. See Drawings for additional information.
5. Grooming and Staking of Trees:
 - a. Prune, thin-out and shape trees in accordance with standard horticultural practice. Prune trees to retain required height and spread. Unless otherwise directed by Landscape Architect, do not cut tree leaders, and remove only injured or dead branches from flowering trees.
 - b. Paint cuts over one-half inch ($\frac{1}{2}$ ") in size with standard tree paint or compound, covering exposed, living tissue. Use paint that is waterproof, antiseptic, adhesive, elastic and free of kerosene, coal tar, creosote, and other substances harmful to plants. Do not use shellac.
 - c. Stake or guy trees immediately after planting, as indicated on Drawings.
6. Grooming of Shrubs:
 - a. Prune, thin-out and shape shrubs in accordance with standard horticultural practice. Prune shrubs to retain natural character and to accomplish their use in landscape design. The required plant size is its size after pruning.
 - b. Remove and replace excessively pruned or malformed new plants resulting from improper pruning.

- C.** Request review by the Landscape Architect after locating, but prior to planting all trees. Under the direction of the Landscape Architect, make slight adjustments to plant material location as necessary to reflect original intention of Drawings.

3.5 WEED CONTROL

- A. Apply pre-emergent weed control to all planting areas (except lawn) after completion of all planting and one complete watering. Follow manufacturer's directions. To prevent washing away of weed control, do not over-water after its application. Do not allow any weed control into lawn areas. Treat any existing noxious weeds, such as Johnson grass, with Roundup in successive treatments until all roots are destroyed, then remove all grass and roots. Notify Owner's Representative of time of installation for verification of application.

3.6 BARK MULCH

- A. Apply mulch at the rate of three inches (3") deep to all planting areas, exclusive of lawn, after the planting and weed control are completed. Twelve inches (12") from planter edges, taper full depth of mulch to meet adjacent grades. Do not place mulch within three inches (3") of trunk or stems.

3.7 CLEAN-UP

- A. During construction, keep the site free of rubbish and debris, and clean up the site promptly when notified to do so. Take care to prevent spillage on streets from hauling and immediately clean up any such spillage and/or debris deposited on streets due to the work of this Section.
- B. During all phases of the construction work, take all precautions to abate dust nuisance by clean-up, sweeping, sprinkling with water, or other means as necessary.
- C. Paving: Maintain cleanliness of paving areas and other public areas used by equipment, and immediately remove spillage; remove rubbish, debris, and other material resulting from landscaping work, leaving site in a safe and clean condition.

3.8 LANDSCAPE MAINTENANCE

- A. The Landscape Maintenance Period will begin when all the Landscape Maintenance Period Requirements have been met (See Part 1 of these Specifications).
- B. Cleaning: Maintain cleanliness on paving areas and other public areas used by equipment and immediately remove all spillage. Remove from project site all rubbish and debris found thereon and all material and debris resulting from landscaping work, leaving the site in a safe and clean condition.
- C. Maintenance:
 - 1. Sprinkler Irrigation System:
 - a. Check system weekly for proper operation. Flush lateral lines out after removing last sprinkler head or two at each end of lateral. Adjust all heads as necessary for unimpeded coverage.

**LANDSCAPING
SECTION 32 9000
3595001**

- b. Set and program automatic controllers for seasonal water requirements. Provide the Owner's Representative with keys to the controllers and instructions on how to turn off system in case of emergency.
 - c. Repair all damages to sprinkler irrigation system as part of the contract work. Make repairs within one watering period or one week, whichever is the least amount of time.
2. Turf Areas:
- a. Begin mowing turf when grass has reached a height of three inches (3") and cut to a height of one-half inches to two inches (1 ½" - 2"). Mow at least weekly after the first cut. Turf must be well-established and free of bare spots and weeds, to satisfaction of Landscape Architect, prior to final acceptance. Do not mow lawns when the soil is not able to support maintenance equipment. Repair wheel marks and ruts caused by the maintenance equipment at no additional cost to the Owner.
 - b. Pick up grass clippings and remove from the site and premises.
 - c. Trim edges at least twice monthly for neat appearance. Vacuum or blow clippings off walks.
 - d. Water the lawns at such frequency as weather conditions require to replenish soil moisture below the root zone. Normally, a total of one and one-half inches (1 ½") of water is needed weekly in hot weather.
 - e. Fertilize the lawn areas at the beginning of the Landscape Maintenance Period and at the completion of the Landscape Maintenance Period. Use a fertilizer with the following characteristics:
 - 1) Slow release, Best 16-6-8, or approved equal, at the rate of 6.25 lbs per 1,000 square feet from March through October.
 - 2) Calcium Nitrate (15-0-0) at the rate of 6.5 lbs per 1,000 square feet from November through February.
 - f. Broadcast fertilizer using a mechanical spreader; do not apply by hand-broadcasting. Sweep all fertilizer off hardscape into adjacent planters.
 - g. Weekly as needed and as directed, re-sod lawn areas with material that matches previously installed material. Use sod to repair any bare areas. Repair areas to receive sod as follows:
 - 1) Mark out areas to receive new sod repair.
 - 2) Cut straight lines that will accept sod the full width of the roll and a minimum of twenty-four inches (24") in length.
 - 3) Transition the grade between existing turf and new sod seamlessly, with no change in elevation.

3. Shrubs:
 - a. Water enough that moisture penetrates throughout root zone and only as frequently as necessary to maintain healthy growth.
 - b. Construct and/or remove water basins around each plant, depending on the time of the year and as directed.
 - c. Do not prune unless directed by the Landscape Architect.
 - d. Replace any dead, dying or vandalized plant material on a weekly basis throughout the Landscape Maintenance Period.
 4. Insecticide and Herbicide Application:
 - a. If needed, control weeds with selective herbicides and sprays. In areas where crabgrass has infested the lawn, apply pre-emergent herbicides such as Dacthal by Amvac, Balan, or Betasan by Gowan for control prior to crabgrass germination. Control insect pests if necessary.
 - b. Use only a licensed Pest Control Operator to apply herbicides and sprays and to maintain a log for applications indicating material, timing, and rate.
- D. Final Acceptance of the Landscape Maintenance Period: request on-site meeting forty-eight hours (48 hrs.) in advance with the Landscape Architect and Owner's Representative to determine the end of the Landscape Maintenance Period.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Domestic water piping system.
 - 2. Fire protection piping systems.
 - 3. Sewer piping system

1.2 RELATED REQUIREMENTS

- A. Section 01 5000, Temporary Facilities and Controls.
- B. Section 01 6116, Volatile Organic Compound (VOC) Restrictions, for VOC limits pertaining to adhesives, sealants, fillers, primers, and coatings.
- C. Section 01 8113, Sustainable Design Requirements, for CAL-Green [and Collaborative for High Performance Schools (CHPS)] general requirements and procedures.
- D. Section 31 0000, Earthwork.
- E. Section 31 2333, Trenching and Backfilling.
- F. Section 32 1600, Site Concrete.

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CAL Green), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- C. California Plumbing Code, (CPC), edition as noted on the Drawings.
- D. California State Health and Safety Code Section 116875, Lead Free Public Water Systems.
- E. Local Jurisdiction: Any work within the street, highway or right-of-way shall be performed in accordance with the requirement of the governmental agencies having jurisdiction, and shall not begin until all of those governing authorities have been notified.
- F. ASTM International (ASTM):
 - 1. D422-63: Test Method for Particle Size Analysis of Soil.
 - 2. D698-00: Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures, Using 5.5 lb (2.49 Kg) Rammer and 12 inch (304.8 mm) Drop.

3. D1556-00: Test Method for Density of Soil in Place by the Sand-Cone Method.
4. D1557-02: Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 10 lb. (4.54 Kg) Rammer and 18 inch (457 mm) Drop.
5. D3017-05: Test Methods for Moisture Content of Soils and Soil-Aggregate Mixture by Nuclear Methods (Shallow Depth).
6. D4318-05: Test Method for Liquid Limit, Plastic Limit, and Plasticity Limit.

G. CALTRANS Standard Specifications.

H. CAL-OSHA, Title 8, Section 1590 (e).

I. NFPA 13, 24 and 25, per CFC chapter 80 and CBC chapter 35.

1.4 ADMINISTRATIVE REQUIREMENTS

A. Submittal Procedures:

1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
3. Sustainable Design Submittals shall comply with the additional requirements of Section 01 8113, Sustainable Design Requirements.

1.5 ACTION SUBMITTALS

- A. Provide supplier's descriptive literature for all products to demonstrate compliance with specified attributes.
- B. Substitution: Provide all data of proposed material being submitted as a substitution. Provide comparison with specified product data and identify all differences. Failure to provide comparison will be reason for rejection.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For contractor / installer.
- B. Provide sieve analysis from accredited testing lab on pipe bedding material. Analysis shall have a current date not older than project contract signing date.
- C. Sustainable Design:
1. General:
 - a. Submit information necessary to establish and document compliance with the California Green Building Standards Code.
 - b. Sustainable design submittals are in addition to other submittals.
 2. The following information shall be provided:
 - a. Adhesives and Sealants: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.

- b. Paints and Coatings: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.

1.7 CLOSEOUT SUBMITTALS

- A. Guarantee: Submit subcontractor's guarantee.
- B. Water Sterilization Test Report.

1.8 QUALITY ASSURANCE

- A. Contractor / Installer shall have been in business for five (5) years providing/finishing similar size projects and complexity.
- B. Contractor shall be solely responsible for all subgrades built. Any repairs resulting from inadequate compaction or incorrect grades will be the responsibility of the contractor.
- C. The representatives of the Owner's testing lab will not act as supervisor of construction, nor will they direct construction operations. Neither the presence of the Owner's testing lab representatives nor the testing by the Owner's testing lab shall excuse the contractors or subcontractors for defects or deficiencies discovered in their work during or following completion of the project. Correcting inadequate compaction is the sole responsibility of the contractor.
- D. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the drawings to be salvaged and re-used.
 - 1. Sun damaged or discolored PVC pipe will be rejected.
- E. All materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.

1.9 FEES, PERMITS, AND UTILITY SERVICES

- A. Obtain and pay for permits and service charges required for installation of Work. Arrange for required inspections and secure written approvals from authorities having jurisdiction.
- B. Upon completion of work within right-of-way, provide copies of written final approval to the Architect.

1.10 DELIVERY, STORAGE AND HANDLING

- A. Transport, store and handle in strict accord with the local jurisdiction and manufacturer's written recommendations
- B. Deliver undamaged products to job in manufacturer's sealed containers and/or original bundles with tags and labels intact.

1.11 EXISTING SITE CONDITIONS

- A. Contractor shall acquaint himself with all site conditions. If unknown active utilities are encountered during work, notify Architect promptly for instructions. Failure to notify will make Contractor liable for damage to these utilities arising from Contractor's operations subsequent to discovery of such unknown active utilities.
- B. Existing civil, mechanical and electrical improvements are shown on respective site plans to the extent known. Should the Contractor encounter any deviation between actual conditions and those shown, he is to immediately notify the Architect before continuing work.

1.12 PROTECTION

- A. Adequate protection measures shall be provided to protect workmen and passers-by on and off the site. Adjacent property shall be fully protected throughout the operations. Blasting will not be permitted. Prevent damage to adjoining improvements and properties both above and below grade. Restore such improvements to original condition should damage occur. Replace trees and shrubs outside building area disturbed by operations.
- B. In accordance with generally accepted construction practices, the Contractor shall be solely and completely responsible for working conditions at the job site, including safety of all persons and property during performance of the work. This requirement shall apply continuously and shall not be limited to normal working hours.
- C. Any construction review of the Contractor's performance conducted by the Geotechnical Engineer is not intended to include review of the adequacy of the Contractor's safety measures, in, on, or near the construction site.
- D. Provide shoring, sheeting, sheet piles and or bracing to prevent caving, erosion or gullyng of sides of excavation.
- E. Surface Drainage: Provide for surface drainage during period of construction in manner to avoid creating nuisance to adjacent areas. The contractor shall make a reasonable effort on a daily basis to provide pumps and all equipment necessary to keep all excavations and the site free from water during entire progress of work, regardless of cause, source, or nature of water.
- F. Adjacent streets and sidewalks shall be kept free of mud, dirt or similar nuisances resulting from earthwork operations.
- G. The site and adjacent influenced areas shall be watered as required to suppress dust nuisance. Dust control measures shall be in accordance with the local jurisdiction.
- H. Trees: Carefully protect existing trees that are to remain. Provide temporary irrigation as necessary to maintain health of trees.

1.13 SEASONAL LIMITS

- A. No fill material shall be placed, spread or rolled during unfavorable weather conditions. When work is interrupted by rains, fill operations shall not be resumed until field tests indicate that moisture content and density of fill are satisfactory.

1.14 RECORD DRAWINGS

- A. Keep a daily record of all pipe placed in ground, verified by Project Inspector.
- B. Upon completion of this Contract, furnish one tracing showing all outside utility lines, piping, etc., installed under this Contract. Locate and dimension all work with reference to permanent landmarks.
- C. All symbols and designations used in preparing "RECORD" drawings shall match those used in Contract drawings.
- D. Properly identify on as-builts and provide dimensions for all stubs for future connections. Provide concrete markers 6" dia. 12" deep, flush with finish grade at the ends of all stubbed pipes.
- E. Provide record drawings per Section 01 3300.

PART 2 - PRODUCTS

2.1 DESIGN AND PERFORMANCE CRITERIA

- A. Sustainable Design:
 - 1. VOC emissions for field-applied adhesives, sealants, and sealant primers must comply with limits specified in Section 01 6116.
 - 2. VOC emissions for field-applied paints and coatings must comply with limits specified in Section 01 6116.

2.2 MATERIALS - GENERAL

- A. Provide each item listed herein or shown on drawings of quality noted or approved equal. All material shall be new, full weight, standard in all respects and in first-class condition. Insofar as possible, all materials used shall be of same brand or manufacture throughout for each class of material or equipment. Materials shall be of domestic manufacture and shall be tested within Continental United States.
- B. Grade or quality of materials desired is indicated by trade names or catalog numbers stated herein.
- C. Dimensions, sizes, and capacities shown are minimum and shall not be changed without permission of Architect.
- D. All materials in this section used for any public water system or domestic water for human consumption shall be lead free.

1. For the purposes of this section, "lead free" means not more than 0.2 percent lead when used with respect to solder and flux and not more than 8 percent when used with respect to pipes and pipe fittings.
2. All pipe, pipe or plumbing fitting or fixtures, solder, or flux shall be certified by an independent American National Standards Institute (ANSI) accredited third party, including, but not limited to, NSF International, as being in compliance with this section.

E. All materials used for fire system piping shall be UL and FM approved.

2.3 VALVE BOXES

- A. Provide at each valve or cock in ground a Christy, Brooks, or equal to Christy G05CT, concrete valve box with cover marked for service, domestic water shall be marked "Water" and fire supply shall be marked "Fire". Furnish extension handles for each size square nut valve, and provide "fork" handle for each size of "wheel handle" valve as required. Do not locate valve boxes in walk, or covered passages, curbs, or curb & gutters, unless necessary. If valve location is within concrete or asphalt paved surface valve box shall be as detailed on plans for such condition. Provide valve box extensions as required to set bottom of valve box to bottom of piping in which valve is installed. Provide Owner with set of special wrenches and/or tools as required for operation of valves.

2.4 PIPES AND FITTINGS

- A. Sanitary Sewer: PVC sewer pipe and fittings with Ring-Tite joints, ASTM D3034 SDR35.
- B. Domestic water Lines 3 1/2" and smaller: Type K copper tubing, hard temper, with wrought copper fittings. Schedule 80 PVC, ASTM D 1784, ASTM D 1785.
- C. Water lines 4" and larger: AWWA C-900 Class 150/DR18 with rubber gasket joints.
- D. Fire lines 4" and larger: AWWA C-900 Class 200/DR14 with rubber gasket joints.
- E. Solder: Lead Free. 95/5; 95% Tin / 5% Antimony.
- F. Ductile Iron Pipe; AWWA Class 51, Cement Lined
- G. Ductile Iron Pipe Fittings; AWWA C110, C153, Ebba Iron, Star Romac, Sigma, or approved equal.
- H. PVC Mechanical Fittings; Ebba Iron, Star; Romac; Sigma or approved equal.
- I. Ductile Iron Pipe/PVC C-900 Pipe Restrained Fittings; Ebba Iron # 3800 Mega Coupling, Ebba Iron 1100CH Split Restrained Harness for pipe couplings. StarGrip Series 4000.
- J. Ductile Iron Pipe/PVC C900, C905 Restrained Degreedand Blind Cap Fittings,;
- K. Mega Lug; Sigma; Romac; or an approved equal

- L. Mechanical Fitting Bolts; Bolts and nuts shall be carbon steel with a minimum 60,000 psi tensile strength conforming to ASTM A 307, Grade A. Bolts shall be standard ANSI B1.1 Class 2A course threads. Nuts shall conform to ASTM A 563 and be standard ANSI B1.1, Class 2A course thread. All bolts and nuts shall be zinc coated.
- M. Fasteners Anti-Rust Coatings; After assembly, coat all fasteners with an Asphaltic Bituminous coatings conforming to latest adopted edition NFPA 24
- N. Ductile Iron Pipe Wrap; 8 mil polyethylene pipe wrap conforming to ANSI/AWWA C105/A21.5 standards.
- O. Pipe Insulation; Pipe exposed to atmospheric conditions ½" thru 4" NPT; Johns Manville rigid fiberglass insulation, Micro Lok HP; Owens Corning Fiberglas SSL II; Conforming to ASTM C 612, Type 1A or type 1B.
- P. Aluminum field applied pipe insulation jacket; comply with ASTM B209, ASTM C1729, ASTM C1371 Manufacturers; Childers Metals; ITW Insulation Systems Aluminum Jacketing; or an approved equal.
 - 1. Finish shall be flat mill finish
 - 2. Factory Fabricated Fitting Covers; 45 and 90 degree elbows, tee's, valve covers, end caps, unions, shall be of the same thickness and finish of jacket.
 - 3. The fittings shall be composed of 2-pieces
 - 4. Adhesives; per the manufacturers requirements
 - 5. Joint Sealant; shall be silicone, and shall be aluminum in color.
- Q. Sewer Forced Main; HDPE, DR 11, color gray with green stripe by JM Eagle or approved equal.

2.5 SANITARY SEWER MANHOLES

- A. Shall be constructed as shown on plan details.

2.6 CLEANOUTS

- A. Cleanouts of same diameter as pipe up to 8" in size shall be installed in all horizontal soil and waste lines where indicated and at all points of change in direction. Cleanouts shall be located not less than 18" from building so as to provide sufficient space for rodding. No horizontal run over 100 feet shall be without cleanout whether shown on drawings or not.
- B. All cleanout boxes shall be traffic rated with labeled lid, Christy G05CT or approved equal. Lid shall be vandal proof with stainless steel screws

2.7 UNIONS

- A. Furnish and install one union at each threaded or soldered connection to equipment and 2 unions, one on each side of valves on pipes ½" to 3".

- B. Locate unions so that piping can be easily disconnected for removal of equipment or valve. Provide type specified in following schedule:

Type of Pipe Union

Steel Pipe: 150 lb. Screwed malleable ground joint, brass, brass-to-iron seat, black or galvanized to match pipe.

Copper tubing: Brass ground joint with sweat connections.

PVC Sch 80 pipe: PVC union, FIPT X FIPT

2.8 VALVES

- A. Provide valves as shown and other valves necessary to segregate branches or units. Furnish valves suitable for service intended. Valves shall be properly packed and lubricated. Valves shall be non-rising stem. Place unions adjacent to each threaded or sweat fitting valve. Install valves with bonnets vertical. All valves shall be lead free.
- B. Valves ½" thru 2"; shall be made of bronze, full size of pipe and lead free. Nibco S-113-FL Series; American G-300 Series; Matco 511 FL Series; Apollo 102T-FL Series. Brass valves of brass parts within valves will not be accepted.
- C. Valves, 2 ½" thru 3" shall be class 150; Shall be made of bronze, full size of pipe; Jenkins Fig. 2310 J; Lunkinheimer Fig. 2153; Crane Fig. 437; Stockham Fig. B-128.
- D. Valves, Flanged; 4" thru 12" Ductile Iron Resilient Wedge Gate Valve; Nibco F 609 RW; American 2500 Series; Kennedy 8561; Mueller 2360 Series.

2.9 TAPPING SLEEVE

- A. Shall be used on pipe sizes 6" thru 12" and shall be made with stainless steel material including stainless steel bolts. Flanges shall be ductile iron or high carbon steel. Gaskets shall seal full circumference of pipe. Shall be manufactured for operating pressure of 200 psi, and shall pass test pressure of 300 psi. Romac SST series; Smithblair 662; Mueller H304; Ford "FAST" tapping sleeve.

2.10 SERVICE SADDLES

- A. Shall be used on pipe size 2" thru 4". Body shall be made from ductile iron with epoxy coating or bronze. Cascade Style CSC-1; A.Y. McDonald model 3891 AWWA/3892 FNPT; Smith-Blair #317; Ford S70, S71, S90, (style B).

2.11 TRACER WIRE

- A. No. 10 THW solid copper wire. Solder all joints

PART 3 - EXECUTION

3.1 DRAWINGS AND COORDINATION

- A. General arrangement and location of piping, etc., are shown on Drawings or herein specified. Install work in accord therewith, except for minor changes that may be necessary on account of other work or existing conditions. Before excavation, carefully examine other work that may conflict with this work. Install this work in harmony with other craft and at proper time to avoid delay of work.
- B. Verify invert elevations at points of connection to existing systems prior to any excavation. If invert elevations differ from that shown on drawings, notify Architect immediately.
- C. In advance of construction, work out minor changes if conflicts occur with electrical or mechanical. Relocate services to suit actual conditions and work of other trades to avoid conflict therewith. Any adjustments or additional fittings to make adjustments shall not be cause for additional costs to the owner.
- D. Execute any work or apparatus shown on drawings and not mentioned in specifications, or vice versa. Omission from Drawings or Specifications of any minor details of construction, installation, materials, or essential specialties does not relieve Contractor of furnishing same in place complete.
- E. Graded pipes shall take precedence. If conflict should occur while placing the domestic water and fire service piping, the contractor shall provide any and all fittings necessary to route the water lines over such conflicting pipes at no additional costs to the owner.

3.2 ACCESS

- A. Continuously check for clearance and accessibility of equipment or materials specified herein to be placed. No allowance of any kind shall be made for negligence on part of Contractor to foresee means of installing his equipment or materials into proper position.

3.3 EXCAVATING AND BACKFILLING

- A. Excavation and Bedding:
 - 1. General: Trench straight and true to line and grade with bottom smooth and free of irregularities or rock points. Trench width to be a minimum of 12" wider than outside diameter of pipe. Follow manufacturer's recommendations for use of each kind and type of pipe.
 - 2. Bedding: Provide a bedding as noted on drawing details for the full length of the pipe. Bedding shall have a minimum thickness beneath the pipe of 4" or 1/8 the outside diameter of the pipe, which ever is greater. Provide bell holes and depressions for pipe joints only of size required to properly make joint.
 - 3. If the trenches for the site utilities falls within areas to be lime treated, the piping shall be installed prior to any lime treatment operations, providing the elevation of the piping is below the treatment section.

UTILITIES
SECTION 33 0000
3595001000

- a. If trenching is necessary in areas that have been previously lime treated the contractor shall backfill the trench with class 2 aggregate base, with minimum section equal to the lime treated section and compacted to 95%.

B. Laying of Pipe:

- 1. General: Inspect pipe prior to placing. Sun damaged pipe will be rejected. Set aside any defective or damaged material. Do not place pipe in water nor place pipe when trenches or weather are unsuitable. Lay pipe bell up grade, true to line and grade.
 - a. Sewer pipe shall be laid in strict conformity to the prescribed line and grade, with grade bars set and each pipe length checked to the grade line. Three consecutive points on the same rate of slope shall be used at all times to detect any variation from a straight grade. In any case of discrepancy, work shall be stopped and the discrepancy immediately reported to the Owner's Representatives. In addition, when requested by the Owner's Representative, a string line shall be used in the bottom of the trench to insure a straight alignment of the sewer pipe between manholes. The maximum deviation from grade shall not be in excess of 1/4 inch. In returning the pipe to grade, no more than 1/4" depression shall result.
 - b. The Contractor shall expose the end of existing pipe to be extended, for verification of alignment and elevation, prior to trenching for any pipe which may be affected. All costs of such excavation and backfill shall be included in the price paid for the various items of work.
 - c. A temporary plug, mechanical type shall be installed on sewer pipe at the point of connection to existing facilities. If connecting to a public facility the plug shall conform to the requirements of the local jurisdiction. This plug shall remain in place until the completion of the balling and flushing operation.
- 2. Bell and Spigot Joints: Lubricate inside of bells and outside of spigots with soap solution. Wedge joints tight. Bell of bell and spigot pipe to be pointed up grade.

C. Backfilling:

- 1. General: Do not start backfill operations until required testing has been accomplished.
- 2. Compaction and Grading: Remainder of backfill shall be in accordance with Section 31 2333 – TRENCHING AND BACKFILLING.
- 3. If trenching in area previously lime or cement treated backfill top of trench section, same depth as lime or cement treatment with Class 2 Aggregate Base compacted to 95% minimum relative compaction.

3.4 INSTALLATION OF WATER PIPING

- A. Immediately cap or plug ends of, and opening in, pipe and fittings to exclude dirt until final connections made. Use reducing fittings where any change in pipe size occurs. Bushings shall not be used.

- B. General: Should existing conditions or other work prevent the running of pipes or the setting of equipment at the points indicated by drawings, changes as authorized by the Architect shall be made without additional cost to the Owner.
- C. All bolts used on mechanical fittings shall be thoroughly coated with an asphaltic bituminous coating conforming to 2022 NFPA (National Fire Protection Association) 10.3.5.2 and 10.8.3.5, CBC chapter 35 and CFC chapter 80.
- D. All buried metal shall be incased with 8 mil polyethylene wrap so that no soil is in contact with metal. Ends of polyethylene wrap shall be taped to provide seal with pipe.
- E. Do not install water lines in same trench with non-metallic sewer lines unless bottom of water pipe at all points is at least 12" above top of sewer line and water line is placed on solid shelf excavated at one side of common trench with a minimum of 12 inch horizontal separation.
- F. Under no circumstance shall a fitting be located directly under a structural footing without prior approval from the Architect.
- G. In locations where existing domestic pipe is rerouted, the new pipe shall be assembled using restrained fittings at all joints including factory pipe joints. Tapped restrained blind flanges shall be temporarily installed at each end of the assembled pipes until testing and chlorination is completed and approved.

3.5 CLOSING IN OF UNINSPECTED WORK

- A. Do not allow or cause work installed to be covered up or enclosed before it has been inspected, tested, and approved. Should work be enclosed or covered up before it has been approved, uncover work at own expense. After it has been inspected, tested and approved, make repairs necessary to restore work of other contractors to condition in which it was found at time of cutting.

3.6 CARE AND CLEANING

- A. Repair or replace broken, damaged, or otherwise defective parts, materials, and work. Leave entire work in new condition satisfactory to Architect. At completion, carefully clean and adjust equipment, fixtures and trim that are installed as part of this work. Leave systems and equipment in satisfactory new operating condition.
- B. Drain and flush piping to remove grease and foreign matter.
- C. Sewer piping shall be balled and flushed.
- D. Clean out and remove surplus materials and debris resulting from the work, including surplus excavated material.
- E. Flush fire service piping in the presence of the project inspector. Flushing shall be continued for a sufficient time as necessary to ensure all foreign material has been removed. Flow rate shall be equal to site fire flow requirements.

3.7 SEWER INTERNAL INSPECTIONS

- A. Upon completion of construction and prior to final inspection, the Contractor shall clean the entire new pipeline of all dirt and debris. Any dirt or debris in previously existing pipes or ditches in the area, which resulted from the new installation, shall also be removed. Pipes shall be cleaned by the controlled balling and flushing method. Temporary plugs shall be installed and maintained during cleaning operations at points of connection to existing facilities to prevent water, dirt, and debris from entering the existing facility.

3.8 TEST OF PIPING

- A. Pressure Test piping at completion of roughing-in, in accord with following schedule, and show no loss in pressure or visible leaks after minimum duration or four (4) hours at test pressures indicated.
- B. Chlorination tests shall be performed after all fixtures and any required mechanical devices are installed and the entire system is complete and closed up.
- C. In cases where new domestic water piping is assembled for re-routing of existing domestic water pipe, the contractor shall perform the following testing prior to connecting the new water pipe to the existing system.
 - 1. The pipe shall be pressure tested and per the test schedule.
 - 2. The pipe shall be pressure tested down within the trench.
 - 3. The contractor shall dig a temporary ditch below the existing pipe to drain to a sump that is lower than the bottom of the trench and to the side of the trench. The sump shall be 30% larger than the total volume of water within the testing pipe assembly.
 - 4. After pressure testing and chlorination has taken place and accepted, the contractor shall drain the pipe into the sump and pump the sump out as it is filling.
 - 5. The temporary test fittings at each end of the pipe assembly shall be removed and the final restrained couplings installed.
 - 6. The existing piping shall be cut and the water within the pipe shall drain below the pipe to the temporary sump. Pump the sump as it is being filled up. Take extreme caution not to contaminate the existing pipe with any contaminants within the trench.
 - 7. Before making the final coupling connections, the restrained couplings at each end of the new pipe shall be thoroughly swabbed inside the fitting with a solution of chlorine mixed with water at a rate of 1 part chlorine to 4 parts potable water.
 - 8. After final connections are made, a visual inspection shall be made after fittings are wiped off. If after 1 hr, no noticeable drips are noted the pipe can be backfilled.
 - 9. The contractor shall flush all water piping affected by chlorination until it is within acceptable levels approved by certified testing lab.

TEST SCHEDULE

<u>System Tested</u>	<u>Test Pressure PSIG Test With</u>
Public Water Mains	Per local jurisdiction requirements.
Private Domestic Water Piping:	150 Lbs. Water 4 hrs.
Fire Protection Piping:	200 Lbs. Water pressure, 4 hrs duration with no pressure loss.
Sanitary Sewer Piping:	Sewer system shall be tested for leakage per local jurisdiction requirements.

- D. Testing equipment, materials, and labor shall be furnished by contractor.

3.9 WATER SYSTEM STERILIZATION

- A. Public Water Mains: Shall be flushed and disinfected per the local jurisdiction requirements
- B. Clean and disinfect all site water systems connected to the domestic water systems in accordance with AWWA Standard C651 and as required by the local Building and Health Department Codes, and EPA.
 - 1. Clean and disinfect industrial water system in addition to the domestic water system.
 - 2. Disinfect existing piping systems as required to provide continuous disinfection upstream to existing valves. At Contractors option, valves may be provided to isolate the existing piping system from the new piping system.
- C. Domestic water sterilization shall be performed by a licensed "qualified applicator" as required by CAL-EPA Pesticide Enforcement Branch for disinfecting and sterilizing drinking water.
- D. Disinfecting Agent: Chlorine product that is a registered product with Cal-EPA for use in California potable water lines, such as Bacticide, CAL-EPA Registration No. 37982-20001.
- E. Contractor to provide a 1" service valve connected to the system at a point within 2'-0" of its junction with the water supply line. After sterilization is complete Contractor to provide cap at valve.
- F. Sterilization Procedure to be as follows:
 - 1. Flush pipe system by opening all outlets and letting water flow through the system until clear water flows from all outlets.

UTILITIES
SECTION 33 0000
3595001000

2. Inject disinfecting agent to provide a minimum chlorine residual concentration of at least 50 parts per million (ppm) of free chlorine at each outlet.
 3. Provide sign at all outlets which reads "Water Sterilization in Progress – Do not operate". Remove signs at conclusion of test.
 4. Close all outlets and valves, including valve connecting to water supply line and 1" service valve. Retain treated water in pipe for a minimum of twenty-four hours. Should chlorine residual at pipe extremities be less than 50 PPM at this time, pipe shall be re-chlorinated. As an option, the water systems may be filled with a water-chlorine solution containing a minimum of 200 PPM of chlorine and allowed to stand for three hours.
 5. After chlorination, flush lines of chlorinated water and refill from domestic supply. Continue flushing until residual chlorine is less than or equal to 0.2 ppm, or a residual the same as that of the test water.
- G. Chemical and bacteriological tests shall be conducted by a state-certified laboratory and approved by the local authorities having jurisdiction.
- H. Submit written report to Health Department as required by State Regulations. Provide a copy of report to Architect prior to completion of project.
- I. The costs of sterilization and laboratory testing shall be paid for by the contractor.

3.10 CLEANING

- A. Upon completion of work of this Section promptly remove from the working area all scraps, debris and surplus material of this Section.

END OF SECTION

s:\master specifications\division 33 - utilities\33 0000_utilities.docx
Formatting Updated: 9-13-21

PART 1 - GENERAL

1.1 SUMMARY

- A. Summary Includes:
 - 1. Storm drainage piping systems.

1.2 RELATED REQUIREMENTS

- A. Section 01 5000, Construction Facilities and Controls.
- B. Section 01 6116, Volatile Organic Compound (VOC) Restrictions, for VOC limits pertaining to adhesives, sealants, fillers, primers, and coatings.
- C. Section 01 8113, Sustainable Design Requirements, for CAL-Green **[and Collaborative for High Performance Schools (CHPS)]** general requirements and procedures.
- D. Section 31 0000, Earthwork.
- E. Section 31 2333, Trenching and Backfilling.
- F. Section 32 1200, Asphalt Concrete Paving.
- G. Section 32 1600, Site Concrete

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CAL Green), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- C. California Plumbing Code, (CPC), edition as noted on the Drawings.
- D. Local Jurisdiction: Any work within the street, highway or right-of-way shall be performed in accordance with the requirement of the governmental agencies having jurisdiction, and shall not begin until all of those governing authorities have been notified.
- E. ASTM International (ASTM):
 - 1. D 422-63 Test Method for Particle Size Analysis of Soil.
 - 2. D698-00 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures, Using 5.5 lb (2.49 Kg) Rammer and 12 inch (304.8 mm) Drop.
 - 3. D1556-00 - Test Method for Density of Soil in Place by the Sand-Cone Method.
 - 4. D1557-02 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 10 lb. (4.54 Kg) Rammer and 18 inch (457 mm) Drop.

STORM DRAINAGE UTILITIES
SECTION 33 4000
3595001000

5. D 3017-05 Test Methods for Moisture Content of Soils and Soil-Aggregate Mixture by Nuclear Methods (Shallow Depth).
6. D 4318-05 Test Method for Liquid Limit, Plastic Limit, and Plasticity Limit.

F. CALTRANS Standard Specifications.

G. CAL-OSHA, Title 8, Section 1590 (e).

1.4 ADMINISTRATIVE REQUIREMENTS

A. Submittal Procedures:

1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
3. Sustainable Design Submittals shall comply with the additional requirements of Section 01 8113, Sustainable Design Requirements.

1.5 ACTION SUBMITTALS

- A. Provide supplier's descriptive literature for all products to demonstrate compliance with specified attributes.
- B. Substitution: Provide all data of proposed material being submitted as a substitution. Provide comparison with specified product data and identify all differences. Failure to provide comparison will be reason for rejection.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: Contractor / installer.
- B. Provide sieve analysis from accredited testing lab on pipe bedding material. Analysis shall have a current date not older than project contract signing date.
- C. Sustainable Design:
1. General:
 - a. Submit information necessary to establish and document compliance with the California Green Building Standards Code.
 - b. Sustainable design submittals are in addition to other submittals.
 2. The following information shall be provided:
 - a. Adhesives and Sealants: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.
 - b. Paints and Coatings: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.

1.7 CLOSEOUT SUBMITTALS

- A. Guarantee: Submit subcontractor's guarantee.

1.8 QUALITY ASSURANCE

- A. Contractor / Installer shall have been in business for five (5) years providing/finishing similar size projects and complexity.
- B. Contractor shall be solely responsible for all subgrades built. Any repairs resulting from inadequate compaction are the responsibility of the contractor.
- C. The representatives of the Owner's testing lab will not act as supervisor of construction, nor will they direct construction operations. Neither the presence of the Owner's testing lab representatives nor the testing by the Owner's testing lab shall excuse the contractors or subcontractors for defects discovered in their work during or following completion of the project. Correcting inadequate compaction is the sole responsibility of the contractor.
- D. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.
 - 1. Sun damaged or discolored PVC pipe will be rejected.
- E. All materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.

1.9 DELIVERY, STORAGE AND HANDLING

- A. Transport, store and handle in strict accord with the local jurisdiction and manufacturer's written recommendations
- B. Deliver undamaged products to job in manufacturer's sealed containers and/or original bundles with tags and labels intact.

1.10 EXISTING SITE CONDITIONS

- A. Contractor shall acquaint himself with all site conditions. If unknown active utilities are encountered during work, notify Architect promptly for instructions. Failure to notify will make Contractor liable for damage to these utilities arising from Contractor's operations subsequent to discovery of such unknown active utilities.
- B. Existing civil, mechanical and electrical improvements are shown on respective site plans to the extent known. Should the Contractor encounter any deviation between actual conditions and those shown, he is to immediately notify the Architect before continuing work.

1.11 PROTECTION

- A. Adequate protection measures shall be provided to protect workmen and passers-by on and off the site. Adjacent property shall be fully protected throughout the operations.

STORM DRAINAGE UTILITIES
SECTION 33 4000
3595001000

Blasting will not be permitted. Prevent damage to adjoining improvements and properties both above and below grade. Restore such improvements to original condition should damage occur. Replace trees and shrubs outside building area disturbed by operations.

- B. In accordance with generally accepted construction practices, the Contractor shall be solely and completely responsible for working conditions at the job site, including safety of all persons and property during performance of the work. This requirement shall apply continuously and shall not be limited to normal working hours.
- C. Any construction review of the Contractor's performance conducted by the Geotechnical Engineer is not intended to include review of the adequacy of the Contractor's safety measures, in, on, or near the construction site.
- D. Provide shoring, sheeting, sheet piles and/or bracing to prevent caving, erosion or gullyng of sides of excavation.
- E. Surface Drainage: Provide for surface drainage during period of construction in manner to avoid creating nuisance to adjacent areas. The contractor shall make a reasonable effort on a daily basis to provide pumps and all equipment necessary to keep all excavations and the site free from water during entire progress of work, regardless of cause, source, or nature of water.
- F. Adjacent streets and sidewalks shall be kept free of mud, dirt or similar nuisances resulting from earthwork operations.
- G. The site and adjacent influenced areas shall be watered as required to suppress dust nuisance. Dust control measures shall be in accordance with the local jurisdiction.
- H. Trees: Carefully protect existing trees that are to remain.

1.12 SEASONAL LIMITS

- A. No fill material shall be placed, spread or rolled during unfavorable weather conditions. When work is interrupted by rains, fill operations shall not be resumed until field tests indicate that moisture content and density of fill are satisfactory.

1.13 TESTING

- A. General: Refer to Section 01 4523 – Testing and Inspection Services, and Structural Tests and Inspections List, DSA-103.
- B. Geotechnical Engineer: Owner is retaining a Geotechnical Engineer to determine compliance of fill with Specifications, and to direct adjustments in fill operations. Costs of Geotechnical Engineer will be borne by Owner; except those costs incurred for re-tests or re-inspection will be paid by Owner and backcharged to Contractor.

1.14 RECORD DRAWINGS

- A. Keep a daily record of all pipe placed in ground, verified by Project Inspector.

STORM DRAINAGE UTILITIES
SECTION 33 4000
3595001000

- B. Upon completion of this Contract, furnish one tracing showing all outside utility lines, piping, etc., installed under this Contract. Locate and dimension all work with reference to permanent landmarks.
- C. All symbols and designations used in preparing "RECORD" drawings shall match those used in Contract drawings.
- D. Properly identify all stubs for future connections, as to location and use, by setting of concrete marker at finished grade in the manner suitable to Architect.

PART 2 - PRODUCTS

2.1 DESIGN AND PERFORMANCE CRITERIA

- A. Sustainable Design:
 - 1. VOC emissions for field-applied adhesives, sealants, and sealant primers must comply with limits specified in Section 01 6116.
 - 2. VOC emissions for field-applied paints and coatings must comply with limits specified in Section 01 6116.

2.2 MATERIALS

- A. Pipe: Use one of the following, unless noted on the Drawings otherwise.
 - 1. Polyvinyl Chloride Pipe (PVC): SDR35 conforming to ASTM D3034 with elastomeric joints conforming to ASTM D3212 for pipe to 12". Sun damaged pipe will be rejected.
 - 2. High density polyethylene pipe (HDPE): The pipe shall be corrugated exterior/smooth interior pipe. 12" to 60" maximum diameter shall conform to AASHTO M294, water tight per ASTM D3212 with water tight gasket fittings.
- B. Perforated Pipe (for subdrains): Shall be ADS N12 pipe, 3 hole, ASTM F 405, AASHTO M 252; PCV ASTM D3034 SDR-35 storm drain pipe
- C. Manhole: Shall be as shown on the drawing details.
- D. Drop Inlet: Shall be as shown on the drawing details.
- E. Curb Inlet: Shall be as shown on the drawing details.
- F. Mortar: For pipe connections to concrete drainage structures, conform to ASTM C270 type N mortar. Place within one half hour after adding water.
- G. Crushed Rock: Imported washed crushed rock. Minimum 100% passing 3/4 inch sieve.
- H. Trench drain: Polycast, Polydrain or equal and as shown on drawings.
- I. Area Drains: Shall be as shown on the drawing details.

STORM DRAINAGE UTILITIES
SECTION 33 4000
3595001000

- J. Floor Drains: Shall be as shown on the drawing details.
- K. Clean-outs: Shall be as shown on the drawing details.
- L. Planter drains: Shall be as detailed on the drawing details.
- M. Filter Fabric: Mirafi 140N.

PART 3 - EXECUTION

3.1 INSPECTION LAYOUT AND PREPARATION

- A. Prior to installation of the work of this Section, carefully inspect and verify by field measurements that installed work of all other trades is complete to the point where this installation may properly commence
- B. Layout all work, establish grades, locate existing underground utilities, set markers and stakes, setup and maintain barricades and protection facilities; all prior to beginning actual earthwork operations. Layout and staking shall be done by a licensed Land Surveyor or Professional Civil Engineer.
- C. Verify that specified items may be installed in accordance with the approved design.
- D. In event of discrepancy, immediately notify Owner and the Architect. Do not proceed in discrepant areas until discrepancies have been fully resolved.

3.2 EXCAVATION AND BACKFILLING

- A. General: Installation shall be in strict conformance with referenced standards, the manufacturer's written directions, as shown on the drawings and as herein specified.
- B. Verify invert elevations at points of connection to existing systems prior to any excavation. If invert elevations differ from that shown on drawings, notify Architect immediately.
- C. Excavation and Bedding:
 - 1. General: Trench straight and true to line and grade with bottom smooth and free of irregularities or rock points. Trench width in accordance with pipe manufacturer's recommendations and as per the drawings. Follow manufacturer's recommendations for use of each kind and type of pipe.
 - 2. Bedding: Provide bedding as detailed on plans for the full length of the pipe. Bedding shall have a minimum thickness beneath the pipe of 4" or 1/8 the outside diameter of the pipe, whichever is greater. Provide bell holes and depressions for pipe joints only of size required to properly make joint.
 - 3. If the trenches for the site drainage fall within areas to be lime treated, the piping shall be installed prior to any lime treatment operations.
 - a. If additional piping is added to previously lime treated areas, the contractor shall backfill the trench with class 2 aggregate base and compact to 95%.

STORM DRAINAGE UTILITIES
SECTION 33 4000
3595001000

D. Laying of Pipe:

1. General: Inspect pipe prior to placing. Set aside any defective or damaged material. Do not place pipe in water nor place pipe when trenches or weather are unsuitable. Lay pipe upgrade, true to line and grade.
2. Bell and Spigot Joints: Lubricate inside of bells and outside of spigots with soap solution or as recommended by manufacture. Wedge joints tight. Bell of bell and spigot pipe to be pointed upgrade.
3. Pipe shall be bedded uniformly throughout its length.
4. Pipe elevation shall be within 0.02 feet of design elevation as shown on plans.
5. Off Site Work: All work beyond the property lines shall be done in strict conformance with the requirements of the governing agency.

E. Backfilling:

1. General: Do not start backfill operations until required testing has been accomplished.
2. Trenches and Excavations: Backfill with material as detailed on plans, filling both sides of the pipe at the same time, carefully tamping to hold pipe in place without movement. Refer to Section 31 2333 – TRENCHING AND BACKFILLING for fill above this layer.

F. Grouting of Pipes: Grout pipes smooth and water tight at drop inlet, manholes, and curb inlets. Grout back side of hood at curb inlets all grouting shall be smooth and consistent.

G. Off Site Work: All work beyond the property lines shall be done in strict conformance with the requirements of the local agency.

H. Cutting and Patching: Remove and replace existing surface features per applicable specification section (i.e. asphaltic concrete or concrete paving) where pipe is installed in areas of existing improvements.

3.3 TOLERANCES

A. Storm Drain structure grates

1. In landscape and lawn areas $\pm 0.05'$.
2. In sidewalk and asphalt pavement $\pm 0.025'$.
3. In curb and gutter application $\pm 0.0125'$.

B. Cleanout Boxes and Lids

1. In landscape areas; 0.10 higher than surrounding finish grade, $\pm 0.05'$.
2. In sidewalks and asphalt pavement; Flush with surrounding finish grade, $\pm 0.025'$.

3.4 DEWATERING

A. Contractor to provide trench dewatering as necessary, no matter what the source is, at no additional cost to the owner.

STORM DRAINAGE UTILITIES
SECTION 33 4000
3595001000

3.5 FLUSHING

- A. The Contractor shall thoroughly ball and flush the storm drain system to remove all dirt and debris. Discharge water to an approved location.

3.6 CLEANING

- A. Upon completion of work of this Section promptly remove from the working area all scraps, debris and surplus material of this Section.
- B. Clean the dirt, rocks, and debris from the drop inlets and storm drain manholes.

END OF SECTION

**Melville Jacobson Elementary
School - TK Portable Classroom
Building**

1750 W. Kavanagh Ave., Tracy, CA 95376

3595001

Tracy Unified School District

1875 W Lowell Ave., Tracy, CA 95376



April 17, 2024

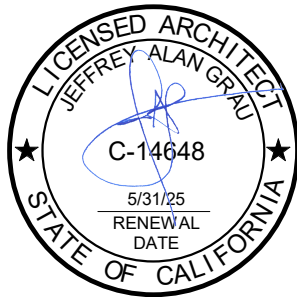
Melville Jacobson Elementary School - TK Portable Classroom Building
Tracy Unified School District
Tracy, California

February 28, 2024

HMC # 3595001

DSA Appl. #02-122129
DSA File #39-73

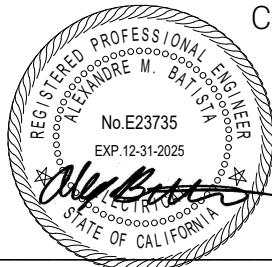
IDENTIFICATION STAMP DIV. OF THE STATE ARCHITECT		
APP: 02-122129 INC:		
REVIEWED FOR		
SS <input checked="" type="checkbox"/>	FLS <input checked="" type="checkbox"/>	ACS <input checked="" type="checkbox"/>
DATE: 04/17/2024		



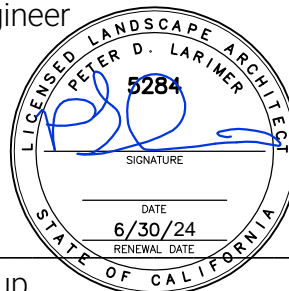
HMC ARCHITECTS
Architect



Warren Consulting Engineers
Civil Engineer



Optimized Energy & Facilities Consulting
Electrical Engineer



MTW Group
Landscape Architect

TABLE OF CONTENTS

DIVISION 00 - PROCUREMENT AND CONTRACTING REQUIREMENTS - NOT USED

DIVISION 01 - GENERAL REQUIREMENTS

SECTION	01 1100 - Summary of Work
	01 2513 - Product Options and Substitutions
	01 2600 - Changes in the Work
	01 2900 - Application for Payment and Conditional and Unconditional Waiver and Release Forms
	01 3119 - Project Meetings
	01 3213 - Scheduling of Work
	01 3300 - Submittal Procedures (Including Submittal Transmittal, Substitution Request, RFI, Electronic Data Request, Megger Grounding Test Certificate, Certification of Chlorination and Sterilization, Certification of Compliance for Building Materials)
	01 3513.23 - Site Standards
	01 3543 - Environmental Procedures
	01 4100 - Regulatory Requirements
	01 4213 - Abbreviations and Acronyms
	01 4216 - Definitions
	01 4219 - References
	01 4300 - Materials and Equipment
	01 4500 - Quality Control
	01 4523 - Testing and Inspection Services
	01 5000 - Temporary Facilities and Controls
	01 5013 - Construction Waste Management and Disposal
	01 5213 - Field Offices
	01 6116 - Volatile Organic Compound (VOC) Restrictions
	01 6600 - Product Delivery Storage and Handling
	01 7329 - Cutting and Patching
	01 7600 - Alteration Project Procedures
	01 7700 - Contract Closeout and Final Cleaning
	01 7823 - Operation and Maintenance Data
	01 7836 - Warranties (Including Contractor Standard Warranty Form, Subcontractor Standard Warranty Form, Special Extended Warranty Form)
	01 7839 - Record Documents
	01 8113 - Sustainable Design Requirements

DIVISION 02 - EXISTING CONDITIONS - NOT USED

DIVISION 03 - CONCRETE - NOT USED

DIVISION 04 - MASONRY - NOT USED

DIVISION 05 - METALS - NOT USED

DIVISION 06 - WOOD, PLASTICS, AND COMPOSITES - NOT USED

DIVISION 07 - THERMAL AND MOISTURE PROTECTION

SECTION	07 9200 - Joint Sealants
---------	--------------------------

DIVISION 08 - OPENINGS - NOT USED

DIVISION 09 - FINISHES

SECTION	09 9100 - Painting
---------	--------------------

DIVISION 10 - SPECIALTIES

SECTION	10 1116 - Markerboards
---------	------------------------

TABLE OF CONTENTS

10 1400 - Signage
10 2813 - Toilet Accessories
10 4416 - Fire Extinguishers and Cabinets

DIVISION 11 - EQUIPMENT - NOT USED

DIVISION 12 - FURNISHINGS

SECTION 12 2113 - Horizontal Louver Blinds
12 3216 - Manufactured Plastic-Laminate-Clad Casework
12 3623 - Plastic-Laminate-Clad Countertops

DIVISION 13 - SPECIAL CONSTRUCTION - NOT USED

DIVISION 14 - CONVEYING EQUIPMENT - NOT USED

DIVISION 21 - FIRE SUPPRESSION - NOT USED

DIVISION 22 - PLUMBING - NOT USED

DIVISION 23 - HEATING, VENTILATING AND AIR CONDITIONING (HVAC) - NOT USED

DIVISION 26 - ELECTRICAL

SECTION 26 0100 - Electrical Basic Requirements
26 0533 - Raceway and Boxes for Electrical Systems
26 2716 - Cabinets and Enclosures
26 2800 - Circuit Protective Devices
26 6116 - Fire Alarm

DIVISION 27 - COMMUNICATIONS

SECTION 27 1000 - Data Communications
27 5123 - Sound and Communications

DIVISION 28 - ELECTRONIC SAFETY AND SECURITY

SECTION 28 3100 - Intrusion Alarm System

DIVISION 31 - EARTHWORK

SECTION 31 0000 - Earthwork
31 2333 - Trenching and Backfilling

DIVISION 32 - EXTERIOR IMPROVEMENTS

SECTION 32 1600 - Site Concrete
32 3113 - Chain Link Fences and Gates
32 8000 - Irrigation
32 9000 - Landscaping

DIVISION 33 - UTILITIES

SECTION 33 0000 - Utilities
33 4000 - Storm Drainage Utilities

"All rights reserved. This Project Manual or any part hereof may not be duplicated without the written consent of Rainforth Grau Architects except in the form of excerpts or quotations for the purpose of review."

SUMMARY OF WORK

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Site Access Conditions and Requirements;
- B. Special Conditions.

1.02 SUMMARY OF WORK COVERED BY CONTRACT DOCUMENTS

- A. The Work of this Contract consists of the following at Melville Jacobson Elementary School:
 - (1) Selective demolition and construction for preparation of the site to receive 1 - 36'x40' relocatable building, including associated civil, architectural and electrical work as indicated in the drawings.

1.03 CONTRACTS

- A. Perform the Work under a single, fixed-price Contract.

1.04 WORK BY OTHERS

- A. Construction of 1 - 36'x40' classroom building by portable manufacturer

1.05 CODES, REGULATIONS, AND STANDARDS

- A. The codes, regulations, and standards adopted by the state and federal agencies having jurisdiction shall govern minimum requirements for this Project. Where codes, regulations, and standards conflict with the Contract Documents, these conflicts shall be brought to the immediate attention of the District and the Architect.
- B. Codes, regulations, and standards shall be as published effective as of date of bid opening, unless otherwise specified or indicated.

1.06 PROJECT RECORD DOCUMENTS

- A. Contractor shall maintain on Site one set of the following record documents; Contractor shall record actual revisions to the Work:
 - (1) Contract Drawings.
 - (2) Specifications.

- (3) Addenda.
 - (4) Change Orders and other modifications to the Contract.
 - (5) Reviewed shop drawings, product data, and samples.
 - (6) Field test records.
 - (7) Inspection certificates.
 - (8) Manufacturer's certificates.
- B. Contractor shall store Record Documents separate from documents used for construction. Provide files, racks, and secure storage for Record Documents and samples.
 - C. Contractor shall record information concurrent with construction progress.
 - D. Specifications: Contractor shall legibly mark and record at each product section of the Specifications the description of the actual product(s) installed, including the following:
 - (1) Manufacturer's name and product model and number.
 - (2) Product substitutions or alternates utilized.
 - (3) Changes made by Addenda and Change Orders and written directives.

1.07 EXAMINATION OF EXISTING CONDITIONS

- A. Contractor shall be held to have examined the Project Site and acquainted itself with the conditions of the Site and of the streets or roads approaching the Site.
- B. Prior to commencement of Work, Contractor shall survey the Site and existing buildings and improvements to observe existing damage and defects such as cracks, sags, broken, missing or damaged glazing, other building elements and Site improvements, and other damage.
- C. Should Contractor observe cracks, sags, and other damage to and defects of the Site and adjacent buildings, paving, and other items not indicated in the Contract Documents, Contractor shall immediately report same to the District and the Architect.

1.08 CONTRACTOR'S USE OF PREMISES

- A. If unoccupied and only with District's prior written approval, Contractor may use the building(s) at the Project Site without limitation for its operations, storage, and office facilities for the performance of the Work. If the District chooses to beneficially occupy any building(s), Contractor must obtain the District's written approval for Contractor's use of spaces and types of operations to be performed within the building(s) while so occupied. Contractor's access to the building(s) shall be limited to the areas indicated.

- B. If the space at the Project Site is not sufficient for Contractor's operations, storage, office facilities and/or parking, Contractor shall arrange and pay for any additional facilities needed by Contractor.
- C. Contractor shall not interfere with use of or access to occupied portions of the building(s) or adjacent property.
- D. Contractor shall maintain corridors, stairs, halls, and other exit-ways of building clear and free of debris and obstructions at all times.
- E. No one other than those directly involved in the demolition and construction, or specifically designated by the District or the Architect shall be permitted in the areas of work during demolition and construction activities.
- F. The Contractor shall install the construction fence and maintain that it will be locked when not in use. Keys to this fencing will be provided to the District.

1.09 PROTECTION OF EXISTING STRUCTURES AND UTILITIES

- A. The Drawings show above-grade and below-grade structures, utility lines, and other installations that are known or believed to exist in the area of the Work. Contractor shall locate these existing installations before proceeding with excavation and other operations that could damage same; maintain them in service, where appropriate; and repair damage to them caused by the performance of the Work. Should damage occur to these existing installations, the costs of repair shall be at the Contractor's expense and made to the District's satisfaction.
- B. Contractor shall be alert to the possibility of the existence of additional structures and utilities. If Contractor encounters additional structures and utilities, Contractor will immediately report to the District for disposition of same as indicated in the General Conditions.

1.10 UTILITY SHUTDOWNS AND INTERRUPTIONS

- A. Contractor shall give the District a minimum of three (3) days written notice in advance of any need to shut off existing utility services or to effect equipment interruptions. The District will set exact time and duration for shutdown, and will assist Contractor with shutdown. Work required to re-establish utility services shall be performed by the Contractor.
- B. Contractor shall obtain District's written approval as indicated in the General Conditions in advance of deliveries of material or equipment or other activities that may conflict with District's use of the building(s) or adjacent facilities.

1.11 STRUCTURAL INTEGRITY

- A. Contractor shall be responsible for and supervise each operation and work that could affect structural integrity of various building elements, both permanent and temporary.
- B. Contractor shall include structural connections and fastenings as indicated or required for complete performance of the Work.

PART 2 – PRODUCTS Not Used.

PART 3 – EXECUTION Not Used.

END OF DOCUMENT

PRODUCT OPTIONS AND SUBSTITUTIONS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. Instructions to Bidders;
- B. General Conditions, including, without limitation, Substitutions For Specified Items; and
- C. Special Conditions.

1.02 SUBSTITUTIONS OF MATERIALS AND EQUIPMENT

- A. Catalog numbers and specific brands or trade names followed by the designation "or equal" are used in conjunction with material and equipment required by the Specifications to establish the standards of quality, utility, and appearance required. Substitutions which are equal in quality, utility, and appearance to those specified may be reviewed subject to the provisions of the General Conditions.
- B. Wherever more than one manufacturer's product is specified, the first-named product is the basis for the design used in the work and the use of alternative-named manufacturers' products or substitutes may require modifications in that design. If such alternatives are proposed by Contractor and are approved by the District and/or the Architect, Contractor shall assume all costs required to make necessary revisions and modifications of the design resulting from the substitutions requested by the Contractor.
- C. When materials and equipment are specified by first manufacturer's name and product number, second manufacturer's name and "or approved equal," supporting data for the second product, if proposed by Contractor, shall be submitted in accordance with the requirements for substitutions. The District's Board has found and determined that certain item(s) shall be used on this Project based on the purpose(s) indicated pursuant to Public Contract Code section 3400(c). These findings, as well as the products and brand or trade names, have been identified in the Notice to Bidders.
- D. The Contractor will not be allowed to substitute specified items unless the request for substitution is submitted as follows:
 - (1) District must receive any notice of request for substitution of a specified item a minimum of ten (10) calendar days prior to bid opening.

- (2) Within 35 days after the date of the Notice of Award, the Contractor shall submit data substantiating the request(s) for all substitution(s) containing sufficient information to assess acceptability of product or system and impact on Project, including, without limitation, the requirements specified in the Special Conditions and the technical Specifications. Insufficient information shall be grounds for rejection of substitution.
- E. If the District and/or Architect, in reviewing proposed substitute materials and equipment, require revisions or corrections to be made to previously accepted Shop Drawings and supplemental supporting data to be resubmitted, Contractor shall promptly do so. If any proposed substitution is judged by the District and/or Architect to be unacceptable, the specified material or equipment shall be provided.
- F. Samples may be required. Tests required by the District and/or Architect for the determination of quality and utility shall be made at the expense of Contractor, with acceptance of the test procedure first given by the District.
- G. In reviewing the supporting data submitted for substitutions, the District and/or Architect will use for purposes of comparison all the characteristics of the specified material or equipment as they appear in the manufacturer's published data even though all the characteristics may not have been particularly mentioned in the Contract Documents. If more than two (2) submissions of supporting data are required, the cost of reviewing the additional supporting data shall be borne by Contractor, and the District will deduct the costs from the Contract Price. The Contractor shall be responsible for any re-design costs occasioned by District's acceptance and/or approval of any substitute.
- H. The Contractor shall, in the event that a substitute is less costly than that specified, credit the District with one hundred percent (100%) of the net difference between the substitute and the originally specified material. In this event, the Contractor agrees to execute a deductive Change Order to reflect that credit. In the event Contractor furnishes a material, process, or article more expensive than that specified, the difference in the cost of that material, process, or article so furnished shall be borne by Contractor.
- I. In no event shall the District be liable for any increase in Contract Price or Contract Time due to any claimed delay in the evaluation of any proposed substitute or in the acceptance or rejection of any proposed substitute.

PART 2 – PRODUCTS Not Used.

PART 3 – EXECUTION Not Used.

END OF DOCUMENT

DOCUMENT 01 26 00

CHANGES IN THE WORK

CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE PROVISIONS IN THE AGREEMENT, GENERAL CONDITIONS, AND SPECIAL CONDITIONS, IF USED, RELATED TO CHANGES AND/OR REQUESTS FOR CHANGES.

END OF DOCUMENT

DOCUMENT 01 29 00

**APPLICATION FOR PAYMENT AND
CONDITIONAL AND UNCONDITIONAL WAIVER AND RELEASE FORMS**

**CONTRACTOR SHALL COMPLY WITH ALL PROVISIONS IN THE GENERAL
CONDITIONS RELATED TO APPLICATIONS FOR PAYMENT AND/OR PAYMENTS.**

**CONDITIONAL WAIVER AND RELEASE
ON PROGRESS PAYMENT
(CIVIL CODE SECTION 8132)**

NOTICE: THIS DOCUMENT WAIVES THE CLAIMANT'S LIEN, STOP PAYMENT NOTICE, AND PAYMENT BOND RIGHTS EFFECTIVE ON RECEIPT OF PAYMENT. A PERSON SHOULD NOT RELY ON THIS DOCUMENT UNLESS SATISFIED THAT THE CLAIMANT HAS RECEIVED PAYMENT.

Name of Claimant: _____

Name of Customer: _____

Job Location: _____

Owner: _____

Through Date: _____

Conditional Waiver and Release

This document waives and releases lien, stop payment notice, and payment bond rights the claimant has for labor and service provided, and equipment and material delivered, to the customer on this job through the Through Date of this document. Rights based upon labor or service provided, or equipment or material delivered, pursuant to a written change order that has been fully executed by the parties prior to the date that this document is signed by the claimant, are waived and released by this document, unless listed as an Exception below. This document is effective only on the claimant's receipt of payment from the financial institution on which the following check is drawn:

Maker of Check: _____

Amount of Check: \$_____

Check Payable to: _____

Exceptions

This document does not affect any of the following:

- (1) Retentions.
- (2) Extras for which the claimant has not received payment.
- (3) The following progress payments for which the claimant has previously given a conditional waiver and release but has not received payment:

Date(s) of waiver and release: _____

Amount(s) of unpaid progress payment(s): \$_____

TRACY UNIFIED SCHOOL DISTRICT

**APPLICATION FOR PAYMENT AND
CONDITIONAL AND UNCONDITIONAL
WAIVER AND RELEASE FORMS
DOCUMENT 01 29 00-2**

- (4) Contract rights, including (A) a right based on rescission, abandonment, or breach of contract, and (B) the right to recover compensation for work not compensated by the payment.

Claimant's Signature: _____

Claimant's Title: _____

Date of Signature: _____

**UNCONDITIONAL WAIVER AND RELEASE
ON PROGRESS PAYMENT
(CIVIL CODE SECTION 8134)**

NOTICE TO CLAIMANT: THIS DOCUMENT WAIVES AND RELEASES LIEN, STOP PAYMENT NOTICE, AND PAYMENT BOND RIGHTS UNCONDITIONALLY AND STATES THAT YOU HAVE BEEN PAID FOR GIVING UP THOSE RIGHTS. THIS DOCUMENT IS ENFORCEABLE AGAINST YOU IF YOU SIGN IT, EVEN IF YOU HAVE NOT BEEN PAID. IF YOU HAVE NOT BEEN PAID, USE A CONDITIONAL WAIVER AND RELEASE FORM.

Name of Claimant: _____

Name of Customer: _____

Job Location: _____

Owner: _____

Through Date: _____

Unconditional Waiver and Release

This document waives and releases lien, stop payment notice, and payment bond rights the claimant has for labor and service provided, and equipment and material delivered, to the customer on this job through the Through Date of this document. Rights based upon labor or service provided, or equipment or material delivered, pursuant to a written change order that has been fully executed by the parties prior to the date that this document is signed by the claimant, are waived and released by this document, unless listed as an Exception below. The claimant has received the following progress payment: \$_____

Exceptions

This document does not affect any of the following:

- (1) Retentions.
- (2) Extras for which the claimant has not received payment.
- (3) Contract rights, including (A) a right based on rescission, abandonment, or breach of contract, and (B) the right to recover compensation for work not compensated by the payment.

Claimant's Signature: _____

Claimant's Title: _____

Date of Signature: _____

**CONDITIONAL WAIVER AND RELEASE
ON FINAL PAYMENT**
(CIVIL CODE SECTION 8136)

NOTICE: THIS DOCUMENT WAIVES THE CLAIMANT'S LIEN, STOP PAYMENT NOTICE, AND PAYMENT BOND RIGHTS EFFECTIVE ON RECEIPT OF PAYMENT. A PERSON SHOULD NOT RELY ON THIS DOCUMENT UNLESS SATISFIED THAT THE CLAIMANT HAS RECEIVED PAYMENT.

Name of Claimant: _____

Name of Customer: _____

Job Location: _____

Owner: _____

Conditional Waiver and Release

This document waives and releases lien, stop payment notice, and payment bond rights the claimant has for labor and service provided, and equipment and material delivered, to the customer on this job. Rights based upon labor or service provided, or equipment or material delivered, pursuant to a written change order that has been fully executed by the parties prior to the date that this document is signed by the claimant, are waived and released by this document, unless listed as an Exception below. This document is effective only on the claimant's receipt of payment from the financial institution on which the following check is drawn:

Maker of Check:

Amount of Check: \$_____

Check Payable to: _____

Exceptions

This document does not affect any of the following: _____

Disputed claims for extras in the amount of: \$_____

Claimant's Signature: _____

Claimant's Title: _____

Date of Signature: _____

**UNCONDITIONAL WAIVER AND RELEASE
ON FINAL PAYMENT**
(CIVIL CODE SECTION 8138)

NOTICE TO CLAIMANT: THIS DOCUMENT WAIVES AND RELEASES LIEN, STOP PAYMENT NOTICE, AND PAYMENT BOND RIGHTS UNCONDITIONALLY AND STATES THAT YOU HAVE BEEN PAID FOR GIVING UP THOSE RIGHTS. THIS DOCUMENT IS ENFORCEABLE AGAINST YOU IF YOU SIGN IT, EVEN IF YOU HAVE NOT BEEN PAID. IF YOU HAVE NOT BEEN PAID, USE A CONDITIONAL WAIVER AND RELEASE FORM.

Name of Claimant: _____

Name of Customer: _____

Job Location: _____

Owner: _____

Unconditional Waiver and Release

This document waives and releases lien, stop payment notice, and payment bond rights the claimant has for all labor and service provided, and equipment and material delivered, to the customer on this job. Rights based upon labor or service provided, or equipment or material delivered, pursuant to a written change order that has been fully executed by the parties prior to the date that this document is signed by the claimant, are waived and released by this document, unless listed as an Exception below. The claimant has been paid in full.

Exceptions

This document does not affect any of the following: _____

Disputed claims for extras in the amount of: \$_____

Claimant's Signature: _____

Claimant's Title: _____

Date of Signature: _____

PROJECT MEETINGS

PART 1 – GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions; and
- B. Special Conditions.

1.02 PROGRESS MEETINGS:

- A. Contractor shall schedule and hold regular weekly progress meetings after a minimum of one week's prior written notice of the meeting date and time to all Invitees as indicated below.
- B. Location: Contractor's field office.
- C. The Contractor shall notify and invite the following entities ("Invitees"):
 - (1) District Representative.
 - (2) Contractor.
 - (3) Contractor's Project Manager.
 - (4) Contractor's Superintendent.
 - (5) Subcontractors, as appropriate to the agenda of the meeting.
 - (6) Suppliers, as appropriate to the agenda of the meeting.
 - (7) Construction Manager, if any.
 - (8) Architect
 - (9) Engineer(s), if any and as appropriate to the agenda of the meeting.
 - (10) Others, as appropriate to the agenda of the meeting.
- D. The District's and/or the Architect's Consultants will attend at their discretion, in response to the agenda.
- E. The District representative, the Construction Manager, and/or another District Agent shall take and distribute meeting notes to attendees and other concerned parties. If exceptions are taken to anything in the meeting notes,

those exceptions shall be stated in writing to the District within five (5) working days following District's distribution of the meeting notes.

1.03 PRE-INSTALLATION/PERFORMANCE MEETING:

- A. Contractor shall schedule a meeting prior to the start of each of the demolition work phases. Contractor shall invite all Invitees to this meeting, and others whose work may affect or be affected by the quality of the demolition work.
- B. Contractor shall review in detail prior to this meeting, the manufacturer's requirements and specifications, applicable portions of the Contract Documents, Shop Drawings, and other submittals, and other related work. At this meeting, invitees shall review and resolve conflicts, incompatibilities, or inadequacies discovered or anticipated.
- C. Contractor shall review in detail Project conditions, schedule, requirements for performance, application, installation, and quality of completed Work, and protection of adjacent Work and property.
- D. Contractor shall review in detail means of protecting the completed Work during the remainder of the construction period.

PART 2 - PRODUCTS Not Used.

PART 3 - EXECUTION Not Used.

END OF DOCUMENT

SCHEDULING OF WORK

PART 1 – GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions;
- B. Special Conditions;
- C. Summary of Work; and
- D. Submittals.

1.02 SECTION INCLUDES

- A. Scheduling of Work under this Contract shall be performed by Contractor in accordance with requirements of this Section.
 - (1) Development of schedule, cost and resource loading of the schedule, monthly payment requests, and project status reporting requirements of the Contract shall employ computerized Critical Path Method ("CPM") scheduling ("CPM Schedule").
 - (2) CPM Schedule shall be cost loaded based on Schedule of Values as approved by District.
 - (3) Submit schedules and reports as specified in the General Conditions.
- B. Upon Award of Contract, Contractor shall immediately commence development of Initial and Original CPM Schedules to ensure compliance with CPM Schedule submittal requirements.

1.03 CONSTRUCTION SCHEDULE

- A. Within ten (10) days of issuance of the issuance Notice to Proceed and before request for first progress payment, the Contractor shall prepare and submit to the Project Manager a construction progress schedule conforming to the Milestone Schedule below.
- B. The Construction Schedule shall be continuously updated, and an updated schedule shall be submitted with each application for progress payment. Each revised schedule shall indicate the work actually accomplished during the previous period and the schedule for completion of the remaining work.

C. Milestone Schedule:

ACTIVITY DESCRIPTION

REQUIRED COMPLETION

CONSTRUCTION STARTS

05-26-2022

PHASE 1 DEMOLITION

PHASE 2 DEMOLITION

FINAL PROJECT COMPLETION

1.04 QUALIFICATIONS

- A. Contractor shall employ experienced scheduling personnel qualified to use the latest version of [i.e., Primavera Project Planner]. Experience level required is set forth below. Contractor may employ such personnel directly or may employ a consultant for this purpose.
- (1) The written statement shall identify the individual who will perform CPM scheduling.
 - (2) Capability and experience shall be verified by description of construction projects on which individual has successfully applied computerized CPM.
 - (3) Required level of experience shall include at least two (2) projects of similar nature and scope with value not less than three fourths ($\frac{3}{4}$) of the Total Bid Price of this Project. The written statement shall provide contact persons for referenced projects with current telephone and address information.
- B. District reserves the right to approve or reject Contractor's scheduler or consultant at any time. District reserves the right to refuse replacing of Contractor's scheduler or consultant, if District believes replacement will negatively affect the scheduling of Work under this Contract.

1.05 GENERAL

- A. Progress Schedule shall be based on and incorporate milestone and completion dates specified in Contract Documents.
- B. Overall time of completion and time of completion for each milestone shown on Progress Schedule shall adhere to times in the Contract, unless an earlier (advanced) time of completion is requested by Contractor and agreed to by District. Any such agreement shall be formalized by a Change Order.
- (1) District is not required to accept an early completion schedule, i.e., one that shows an earlier completion date than the Contract Time.
 - (2) Contractor shall not be entitled to extra compensation in event agreement is reached on an earlier completion schedule and Contractor completes its Work, for whatever reason, beyond completion date shown in its early completion schedule but within the Contract Time.

- (3) A schedule showing the work completed in less than the Contract Time, and that has been accepted by District, shall be considered to have Project Float. The Project Float is the time between the scheduled completion of the work and the Completion Date. Project Float is a resource available to both District and the Contractor.
- C. Ownership Project Float: Neither the District nor Contractor owns Project Float. The Project owns the Project Float. As such, liability for delay of the Completion Date rests with the party whose actions, last in time, actually cause delay to the Completion Date.
 - (1) For example, if Party A uses some, but not all of the Project Float and Party B later uses remainder of the Project Float as well as additional time beyond the Project Float, Party B shall be liable for the time that represents a delay to the Completion Date.
 - (2) Party A would not be responsible for the time since it did not consume the entire Project Float and additional Project Float remained; therefore, the Completion Date was unaffected by Party A.
- D. Progress Schedule shall be the basis for evaluating job progress, payment requests, and time extension requests. Responsibility for developing Contract CPM Schedule and monitoring actual progress as compared to Progress Schedule rests with Contractor.
- E. Failure of Progress Schedule to include any element of the Work, or any inaccuracy in Progress Schedule, will not relieve Contractor from responsibility for accomplishing the Work in accordance with the Contract. District's acceptance of schedule shall be for its use in monitoring and evaluating job progress, payment requests, and time extension requests and shall not, in any manner, impose a duty of care upon District, or act to relieve Contractor of its responsibility for means and methods of construction.
- F. Software: Use [i.e, District Project Planner for Windows, latest version]. Such software shall be compatible with Windows operating system. Contractor shall transmit contract file to District on compact disk at times requested by District.
- G. Transmit each item under the form approved by District.
 - (1) Identify Project with District Contract number and name of Contractor.
 - (2) Provide space for Contractor's approval stamp and District's review stamps.
 - (3) Submittals received from sources other than Contractor will be returned to the Contractor without District's review.

1.06 INITIAL CPM SCHEDULE

- A. Initial CPM Schedule submitted for review at the pre-construction conference shall serve as Contractor's schedule for up to ninety (90) calendar days after the Notice to Proceed.

- B. Indicate detailed plan for the Work to be completed in first ninety (90) days of the Contract; details of planned mobilization of plant and equipment; sequence of early operations; procurement of materials and equipment. Show Work beyond ninety (90) calendar days in summary form.
- C. Initial CPM Schedule shall be time scaled.
- D. Initial CPM Schedule shall be cost and resource loaded. Accepted cost and resource loaded schedule will be used as basis for monthly progress payments until acceptance of the Original CPM Schedule. Use of Initial CPM Schedule for progress payments shall not exceed ninety (90) calendar days.
- E. District and Contractor shall meet to review and discuss the Initial CPM Schedule within seven (7) calendar days after it has been submitted to District.
 - (1) District's review and comment on the schedule shall be limited to Contract conformance (with sequencing, coordination, and milestone requirements).
 - (2) Contractor shall make corrections to schedule necessary to comply with Contract requirements and shall adjust schedule to incorporate any missing information requested by District. Contractor shall resubmit Initial CPM Schedule if requested by District.
- F. If, during the first ninety (90) days after Notice to Proceed, the Contractor is of the opinion that any of the Work included on its Initial CPM Schedule has been impacted, the Contractor shall submit to District a written Time Impact Evaluation ("TIE") in accordance with Article 1.12 of this Section. The TIE shall be based on the most current update of the Initial CPM Schedule.

1.07 ORIGINAL CPM SCHEDULE

- A. Submit a detailed proposed Original CPM Schedule presenting an orderly and realistic plan for completion of the Work in conformance with requirements as specified herein.
- B. Progress Schedule shall include or comply with following requirements:
 - (1) Time scaled, cost and resource (labor and major equipment) loaded CPM schedule.
 - (2) No activity on schedule shall have duration longer than fifteen (15) work days, with exception of submittal, approval, fabrication and procurement activities, unless otherwise approved by District.
 - (a) Activity durations shall be total number of actual work days required to perform that activity.
 - (3) The start and completion dates of all items of Work, their major components, and milestone completion dates, if any.

- (4) District furnished materials and equipment, if any, identified as separate activities.
- (5) Activities for maintaining Project Record Documents.
- (6) Dependencies (or relationships) between activities.
- (7) Processing/approval of submittals and shop drawings for all material and equipment required per the Contract. Activities that are dependent on submittal acceptance or material delivery shall not be scheduled to start earlier than expected acceptance or delivery dates.
 - (a) Include time for submittals, re-submittals and reviews by District. Coordinate with accepted schedule for submission of Shop Drawings, samples, and other submittals.
 - (b) Contractor shall be responsible for all impacts resulting from re-submittal of Shop Drawings and submittals.
- (8) Procurement of major equipment, through receipt and inspection at jobsite, identified as separate activity.
 - (a) Include time for fabrication and delivery of manufactured products for the Work.
 - (b) Show dependencies between procurement and construction.
- (9) Activity description; what Work is to be accomplished and where.
- (10) The total cost of performing each activity shall be total of labor, material, and equipment, excluding overhead and profit of Contractor. Overhead and profit of the General Contractor shall be shown as a separate activity in the schedule. Sum of cost for all activities shall equal total Contract value.
- (11) Resources required (labor and major equipment) to perform each activity.
- (12) Responsibility code for each activity corresponding to Contractor or Subcontractor responsible for performing the Work.
- (13) Identify the activities which constitute the controlling operations or critical path. No more than twenty-five (25%) of the activities shall be critical or near critical. Near critical is defined as float in the range of one (1) to (10) days.
- (14) Twenty (20) workdays for developing punch list(s), completion of punch-list items, and final clean up for the Work or any designated portion thereof. No other activities shall be scheduled during this period.
- (15) Interface with the work of other contractors, District, and agencies such as, but not limited to, utility companies.

- (16) Show detailed Subcontractor Work activities. In addition, furnish copies of Subcontractor schedules upon which CPM was built.
 - (a) Also furnish for each Subcontractor, as determined by District, submitted on Subcontractor letterhead, a statement certifying that Subcontractor concurs with Contractor's Original CPM Schedule and that Subcontractor's related schedules have been incorporated, including activity duration, cost and resource loading.
 - (b) Subcontractor schedules shall be independently derived and not a copy of Contractor's schedule.
 - (c) In addition to Contractor's schedule and resource loading, obtain from electrical, mechanical, and plumbing Subcontractors, and other Subcontractors as required by District, productivity calculations common to their trades, such as units per person day, feet of pipe per day per person, feet of wiring per day per person, and similar information.
 - (d) Furnish schedule for Contractor/Subcontractor CPM schedule meetings which shall be held prior to submission of Original CPM schedule to District. District shall be permitted to attend scheduled meetings as an observer.
- (17) Activity durations shall be in Work days.
- (18) Submit with the schedule a list of anticipated non-Work days, such as weekends and holidays. The Progress Schedule shall exclude in its Work day calendar all non-Work days on which Contractor anticipates critical Work will not be performed.
- C. Original CPM Schedule Review Meeting: Contractor shall, within sixty (60) days from the Notice to Proceed date, meet with District to review the Original CPM Schedule submittal.
 - (1) Contractor shall have its Project Manager, Project Superintendent, Project Scheduler, and key Subcontractor representatives, as required by District, in attendance. The meeting will take place over a continuous one (1) day period.
 - (2) District's review will be limited to submittal's conformance to Contract requirements including, but not limited to, coordination requirements. However, review may also include:
 - (a) Clarifications of Contract Requirements.
 - (b) Directions to include activities and information missing from submittal.
 - (c) Requests to Contractor to clarify its schedule.

- (3) Within five (5) days of the Schedule Review Meeting, Contractor shall respond in writing to all questions and comments expressed by District at the Meeting.

1.08 ADJUSTMENTS TO CPM SCHEDULE

- A. Adjustments to Original CPM Schedule: Contractor shall have adjusted the Original CPM Schedule submittal to address all review comments from original CPM Schedule review meeting and resubmit network diagrams and reports for District's review.
 - (1) District, within ten (10) days from date that Contractor submitted the revised schedule, will either:
 - (a) Accept schedule and cost and resource loaded activities as submitted, or
 - (b) Advise Contractor in writing to review any part or parts of schedule which either do not meet Contract requirements or are unsatisfactory for District to monitor Project's progress, resources, and status or evaluate monthly payment request by Contractor.
 - (2) District may accept schedule with conditions that the first monthly CPM Schedule update be revised to correct deficiencies identified.
 - (3) When schedule is accepted, it shall be considered the "Original CPM Schedule" which will then be immediately updated to reflect the current status of the work.
 - (4) District reserves right to require Contractor to adjust, add to, or clarify any portion of schedule which may later be discovered to be insufficient for monitoring of Work or approval of partial payment requests. No additional compensation will be provided for such adjustments, additions, or clarifications.
- B. Acceptance of Contractor's schedule by District will be based solely upon schedule's compliance with Contract requirements.
 - (1) By way of Contractor assigning activity durations and proposing sequence of Work, Contractor agrees to utilize sufficient and necessary management and other resources to perform work in accordance with the schedule.
 - (2) Upon submittal of schedule update, updated schedule shall be considered "current" CPM Schedule.
 - (3) Submission of Contractor's schedule to District shall not relieve Contractor of total responsibility for scheduling, sequencing, and pursuing Work to comply with requirements of Contract Documents, including adverse effects such as delays resulting from ill-timed Work.

- C. Submittal of Original CPM Schedule, and subsequent schedule updates, shall be understood to be Contractor's representation that the Schedule meets requirements of Contract Documents and that Work shall be executed in sequence indicated on the schedule.
- D. Contractor shall distribute Original CPM Schedule to Subcontractors for review and written acceptance, which shall be noted on Subcontractors' letterheads to Contractor and transmitted to District for the record.

1.09 MONTHLY CPM SCHEDULE UPDATE SUBMITTALS

- A. Following acceptance of Contractor's Original CPM Schedule, Contractor shall monitor progress of Work and adjust schedule each month to reflect actual progress and any anticipated changes to planned activities.
 - (1) Each schedule update submitted shall be complete, including all information requested for the Original CPM Schedule submittal.
 - (2) Each update shall continue to show all Work activities including those already completed. These completed activities shall accurately reflect "as built" information by indicating when activities were actually started and completed.
- B. A meeting will be held on approximately the twenty-fifth (25th) of each month to review the schedule update submittal and progress payment application.
 - (1) At this meeting, at a minimum, the following items will be reviewed: Percent (%) complete of each activity; Time Impact Evaluations for Change Orders and Time Extension Request; actual and anticipated activity sequence changes; actual and anticipated duration changes; and actual and anticipated Contractor delays.
 - (2) These meetings are considered a critical component of overall monthly schedule update submittal and Contractor shall have appropriate personnel attend. At a minimum, these meetings shall be attended by Contractor's General Superintendent and Scheduler.
 - (3) Contractor shall plan on the meeting taking no less than four (4) hours.
- C. Within five (5) working days after monthly schedule update meeting, Contractor shall submit the updated CPM Schedule update.
- D. Within five (5) work days of receipt of above noted revised submittals, District will either accept or reject monthly schedule update submittal.
 - (1) If accepted, percent (%) complete shown in monthly update will be basis for Application for Payment by the Contractor. The schedule update shall be submitted as part of the Contractor's Application for Payment.

- (2) If rejected, update shall be corrected and resubmitted by Contractor before the Application for Payment is submitted.
- E. Neither updating, changing or revising of any report, curve, schedule, or narrative submitted to District by Contractor under this Contract, nor District's review or acceptance of any such report, curve, schedule or narrative shall have the effect of amending or modifying in any way the Completion Date or milestone dates or of modifying or limiting in any way Contractor's obligations under this Contract.

1.10 SCHEDULE REVISIONS

- A. Updating the Schedule to reflect actual progress shall not be considered revisions to the Schedule. Since scheduling is a dynamic process, revisions to activity durations and sequences are expected on a monthly basis.
- B. To reflect revisions to the Schedule, the Contractor shall provide District with a written narrative with a full description and reasons for each Work activity revised. For revisions affecting the sequence of work, the Contractor shall provide a schedule diagram which compares the original sequence to the revised sequence of work. The Contractor shall provide the written narrative and schedule diagram for revisions two (2) working days in advance of the monthly schedule update meeting.
- C. Schedule revisions shall not be incorporated into any schedule update until the revisions have been reviewed by District. District may request further information and justification for schedule revisions and Contractor shall, within three (3) days, provide District with a complete written narrative response to District's request.
- D. If the Contractor's revision is still not accepted by District, and the Contractor disagrees with District's position, the Contractor has seven (7) calendar days from receipt of District's letter rejecting the revision to provide a written narrative providing full justification and explanation for the revision. The Contractor's failure to respond in writing within seven (7) calendar days of District's written rejection of a schedule revision shall be contractually interpreted as acceptance of District's position, and the Contractor waives its rights to subsequently dispute or file a claim regarding District's position.
- E. At District's discretion, the Contractor can be required to provide Subcontractor certifications of performance regarding proposed schedule revisions affecting said Subcontractors.

1.11 RECOVERY SCHEDULE

- A. If the Schedule Update shows a completion date twenty-one (21) calendar days beyond the Contract Completion Date, or individual milestone completion dates, the Contractor shall submit to District the proposed revisions to recover the lost time within seven (7) calendar days. As part of this submittal, the Contractor shall provide a written narrative for each revision made to recapture the lost time. If the revisions include sequence changes, the Contractor shall provide a schedule diagram comparing the original sequence to the revised sequence of work.

- B. The revisions shall not be incorporated into any schedule update until the revisions have been reviewed by District.
- C. If the Contractor's revisions are not accepted by District, District and the Contractor shall follow the procedures in paragraph 1.09.C, 1.09.D and 1.09.E above.
- D. At District's discretion, the Contractor can be required to provide Subcontractor certifications for revisions affecting said Subcontractors.

1.12 TIME IMPACT EVALUATION ("TIE") FOR CHANGE ORDERS, AND OTHER DELAYS

- A. When Contractor is directed to proceed with changed Work, the Contractor shall prepare and submit within fourteen (14) calendar days from the Notice to Proceed a TIE which includes both a written narrative and a schedule diagram depicting how the changed Work affects other schedule activities. The schedule diagram shall show how the Contractor proposes to incorporate the changed Work in the schedule and how it impacts the current schedule-update critical path. The Contractor is also responsible for requesting time extensions based on the TIE's impact on the critical path. The diagram must be tied to the main sequence of schedule activities to enable District to evaluate the impact of changed Work to the scheduled critical path.
- B. Contractor shall be required to comply with the requirements of Paragraph 1.09.A for all types of delays such as, but not limited to, Contractor/Subcontractor delays, adverse weather delays, strikes, procurement delays, fabrication delays, etc.
- C. Contractor shall be responsible for all costs associated with the preparation of TIEs, and the process of incorporating them into the current schedule update. The Contractor shall provide District with four (4) copies of each TIE.
- D. Once agreement has been reached on a TIE, the Contract Time will be adjusted accordingly. If agreement is not reached on a TIE, the Contract Time may be extended in an amount District allows, and the Contractor may submit a claim for additional time claimed by contractor.

1.13 TIME EXTENSIONS

- A. The Contractor is responsible for requesting time extensions for time impacts that, in the opinion of the Contractor, impact the critical path of the current schedule update. Notice of time impacts shall be given in accord with the General Conditions.
- B. Where an event for which District is responsible impacts the projected Completion Date, the Contractor shall provide a written mitigation plan, including a schedule diagram, which explains how (e.g., increase crew size, overtime, etc.) the impact can be mitigated. The Contractor shall also include a detailed cost breakdown of the labor, equipment, and material the Contractor would expend to mitigate District-caused time impact. The Contractor shall submit its mitigation plan to District within fourteen (14)

calendar days from the date of discovery of the impact. The Contractor is responsible for the cost to prepare the mitigation plan.

- C. Failure to request time, provide TIE, or provide the required mitigation plan will result in Contractor waiving its right to a time extension and cost to mitigate the delay.
- D. No time will be granted under this Contract for cumulative effect of changes.
- E. District will not be obligated to consider any time extension request unless the Contractor complies with the requirements of Contract Documents.
- F. Failure of the Contractor to perform in accordance with the current schedule update shall not be excused by submittal of time extension requests.
- G. If the Contractor does not submit a TIE within the required fourteen (14) calendar days for any issue, it is mutually agreed that the Contractor does not require a time extension for said issue.

1.14 SCHEDULE REPORTS

- A. Submit four (4) copies of the following reports with the Initial CPM Schedule, the Original CPM Schedule, and each monthly update.
- B. Required Reports:
 - (1) Two activity listing reports: one sorted by activity number and one by total Project Float. These reports shall also include each activity's early/late and actual start and finish dates, original and remaining duration, Project Float, responsibility code, and the logic relationship of activities.
 - (2) Cost report sorted by activity number including each activity's associated cost, percentage of Work accomplished, earned value- to date, previous payments, and amount earned for current update period.
 - (3) Schedule plots presenting time-scaled network diagram showing activities and their relationships with the controlling operations or critical path clearly highlighted.
 - (4) Cash flow report calculated by early start, late start, and indicating actual progress. Provide an exhibit depicting this information in graphic form.
 - (5) Planned versus actual resource (i.e., labor) histogram calculated by early start and late start.
- C. Other Reports:

In addition to above reports, District may request, from month to month, any two of the following reports. Submit four (4) copies of all reports.

- (1) Activities by early start.
 - (2) Activities by late start.
 - (3) Activities grouped by Subcontractors or selected trades.
 - (4) Activities with scheduled early start dates in a given time frame, such as fifteen (15) or thirty (30) day outlook.
- D. Furnish District with report files on compact disks containing all schedule files for each report generated.

1.15 PROJECT STATUS REPORTING

- A. In addition to submittal requirements for CPM scheduling identified in this Section, Contractor shall provide a monthly project status report (i.e., written narrative report) to be submitted in conjunction with each CPM Schedule as specified herein. Status reporting shall be in form specified below.
- B. Contractor shall prepare monthly written narrative reports of status of Project for submission to District. Written status reports shall include:
- (1) Status of major Project components (percent (%) complete, amount of time ahead or behind schedule) and an explanation of how Project will be brought back on schedule if delays have occurred.
 - (2) Progress made on critical activities indicated on CPM Schedule.
 - (3) Explanations for any lack of work on critical path activities planned to be performed during last month.
 - (4) Explanations for any schedule changes, including changes to logic or to activity durations.
 - (5) List of critical activities scheduled to be performed next month.
 - (6) Status of major material and equipment procurement.
 - (7) Any delays encountered during reporting period.
 - (8) Contractor shall provide printed report indicating actual versus planned resource loading for each trade and each activity. This report shall be provided on weekly and monthly basis.
 - (a) Actual resource shall be accumulated in field by Contractor, and shall be as noted on Contractor's daily reports. These reports will be basis for information provided in computer-generated monthly and weekly printed reports.
 - (b) Contractor shall explain all variances and mitigation measures.

- (9) Contractor may include any other information pertinent to status of Project. Contractor shall include additional status information requested by District at no additional cost.
- (10) Status reports, and the information contained therein, shall not be construed as claims, notice of claims, notice of delay, or requests for changes or compensation.

1.16 WEEKLY SCHEDULE REPORT

At the Weekly Progress Meeting, the Contractor shall provide and present a time-scaled three (3) week look-ahead schedule that is based and correlated by activity number to the current schedule (i.e., Initial, Original CPM, or Schedule Update).

1.17 DAILY CONSTRUCTION REPORTS

On a daily basis, Contractor shall submit a daily activity report to District for each workday, including weekends and holidays when worked. Contractor shall develop the daily construction reports on a computer-generated database capable of sorting daily Work, manpower, and man-hours by Contractor, Subcontractor, area, sub-area, and Change Order Work. Upon request of District, furnish computer disk of this data base. Obtain District's written approval of daily construction report data base format prior to implementation. Include in report:

- A. Project name and Project number.
- B. Contractor's name and address.
- C. Weather, temperature, and any unusual site conditions.
- D. Brief description and location of the day's scheduled activities and any special problems and accidents, including Work of Subcontractors. Descriptions shall be referenced to CPM scheduled activities.
- E. Worker quantities for its own Work force and for Subcontractors of any tier.
- F. Equipment, other than hand tools, utilized by Contractor and Subcontractors.

1.18 PERIODIC VERIFIED REPORTS

Contractor shall complete and verify construction reports on a form prescribed by the Division of the State Architect and file reports on the first day of February, May, August, and November during the preceding quarter year; at the completion of the Contract; at the completion of the Work; at the suspension of Work for a period of more than one (1) month; whenever the services of Contractor or any of Contractor's Subcontractors are terminated for any reason; and at any time a special verified report is required by the Division of the State Architect. Refer to section 4-336 and section 4-343 of Part 1, Title 24 of the California Code of Regulations.

PART 2 – PRODUCTS Not Used.

PART 3 - EXECUTION Not Used.

END OF DOCUMENT

SUBMITTALS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Contractor's Submittals and Schedules, Drawings and Specifications;
- B. Special Conditions.

1.02 SECTION INCLUDES:

- A. Definitions:
 - (1) Shop Drawings and Product Data are as indicated in the General Conditions and include, but are not limited to, fabrication, erection, layout and setting drawings, formwork and falsework drawings, manufacturers' standard drawings, descriptive literature, catalogues, brochures, performance and test data, wiring and control diagrams. In addition, there are other drawings and descriptive data pertaining to materials, equipment, piping, duct and conduit systems, and methods of construction as may be required to show that the materials, equipment or systems and all positions conform to the requirement of the Contract Documents, including, without limitation, the Drawings.
 - (2) "Manufactured" applies to standard units usually mass-produced; "fabricated" means specifically assembled or made out of selected materials to meet design requirements. Shop Drawings shall establish the actual detail of manufactured or fabricated items, indicated proper relation to adjoining work and amplify design details of mechanical and electrical equipment in proper relation to physical spaces in the structure.
 - (3) Manufacturer's Instructions: Where any item of Work is required by the Contract Documents to be furnished, installed, or performed, at a minimum, in accordance with a specified product manufacturer's instructions, the Contractor shall procure and distribute copies of these to the District, the Architect, and all other concerned parties and shall furnish, install, or perform the work, at a minimum, in accordance with those instructions.
- B. Samples, Shop Drawings, Product Data, and other items as specified, in accordance with the following requirements:
 - (1) Contractor shall submit all Shop Drawings, Product Data, and Samples to the District, the Architect, the Project Inspector, and the Construction Manager.

Contractor to review section
01 3300 as well as this
document

- (2) Contractor shall comply with all time frames herein and in the General Conditions and, in any case, shall submit required information in sufficient time to permit proper consideration and action before ordering any materials or items represented by such Shop Drawings, Product Data, and/or Samples.
- (3) Contractor shall allow sufficient time so that no delay occurs due to required lead time in ordering or delivery of any item to the Site. Contractor shall be responsible for any delay in progress of Work due to its failure to observe these requirements.
- (4) Time for completion of Work shall not be extended on account of Contractor's failure to promptly submit Shop Drawings, Product Data, and/or Samples.
- (5) Reference numbers on Shop Drawings shall have Architectural and/or Engineering Contract Drawings reference numbers for details, sections, and "cuts" shown on Shop Drawings. These reference numbers shall be in addition to any numbering system that Contractor chooses to use or has adopted as standard.
- (6) When the magnitude or complexity of submittal material prevents a complete review within the stated time frame, Contractor shall make this submittal in increments to avoid extended delays.
- (7) Contractor shall certify on submittals for review that submittals conform to Contract requirements. Also certify that Contractor-furnished equipment can be installed in allocated space. In event of any variance, Contractor shall specifically state in transmittal and on Shop Drawings, portions vary and require approval of a substitute. Submittals shall not be used as a means of requesting a substitution.
- (8) Unless specified otherwise, sampling, preparation of samples, and tests shall be in accordance with the latest standard of the American Society for Testing and Materials.
- (9) Upon demand by Architect or District, Contractor shall submit samples of materials and/or articles for tests or examinations and consideration before Contractor incorporates same in Work. Contractor shall be solely responsible for delays due to sample(s) not being submitted in time to allow for tests. Acceptance or rejection will be expressed in writing. Work shall be equal to approved samples in every respect. Samples that are of value after testing will remain the property of Contractor.

C. Submittal Schedule:

- (1) Contractor shall prepare its proposed submittal schedule that is coordinated with the proposed construction schedule and submit both to the District within ten (10) days after the date of the Notice to Proceed. Contractor's proposed schedules shall become the Project Construction Schedule and the Project Submittal Schedule after each is approved by the District.

Contractor to review section
01 3300 as well as this
document

- (2) Contractor is responsible for all lost time should the initial submittal be rejected, marked "revise and resubmit", etc.
- (3) All Submittals shall be forwarded to the District by the date indicated on the approved Submittal Schedule, unless an earlier date is necessary to maintain the Construction Schedule, in which case those Submittals shall be forwarded to the District so as not to delay the Construction Schedule.
- (4) Contractor may be assessed \$100 a day for each day it is late in submitting a shop drawing or sample. No extensions of time will be granted to Trade Contractor or any Subcontractor because of its failure to have shop drawings and samples submitted in accordance with the Schedule.

1.03 SHOP DRAWINGS:

- A. Contractor shall submit one reproducible transparency and six (6) opaque reproductions. The District will review and return the reproducible copy and one (1) opaque reproduction to Contractor.
- B. Before commencing installation of any Work, the Contractor shall submit and receive approval of all drawings, descriptive data, and material list(s) as required to accomplish Work.
- C. Review of Shop Drawings is regarded as a service to assist Contractor and in all cases original Contract Documents shall take precedence as outlined under General Conditions.
- D. No claim for extra time or payment shall be based on work shown on Shop Drawings unless the claim is (1) noted on Contractor's transmittal letter accompanying Shop Drawings and (2) Contractor has complied with all applicable provisions of the General Conditions, including, without limitation, provisions regarding changes and payment, and all required written approvals.
- E. District shall not review Shop Drawings for quantities of materials or number of items supplied.
- F. District's and/or Architect's review of Shop Drawing will be general. District and/or Architect review does not relieve Contractor of responsibility for dimensions, accuracy, proper fitting, construction of Work, furnishing of materials, or Work required by Contract Documents and not indicated on Shop Drawings. The District's and/or Architect's review of Shop Drawings is not to be construed as approving departures from Contract Documents.
- G. Review of Shop Drawings and Schedules does not relieve Contractor from responsibility for any aspect of those Drawings or Schedules that is a violation of local, County, State, or Federal laws, rules, ordinances, or rules and regulations of commissions, boards, or other authorities or utilities having jurisdiction.
- H. Before submitting Shop Drawings for review, Contractor shall check Shop Drawings of its subcontractors for accuracy, and confirm that all Work

Contractor to review section
01 3300 as well as this
document

contiguous with and having bearing on other work shown on Shop Drawings is accurately drawn and in conformance with Contract Documents.

- I. Submitted drawings and details must bear stamp of approval of Contractor:
 - (1) Stamp and signature shall clearly certify that Contractor has checked Shop Drawings for compliance with Drawings.
 - (2) If Contractor submits a Shop Drawing without an executed stamp of approval, or whenever it is evident (despite stamp) that Drawings have not been checked, the District and/or Architect will not consider them and will return them to the Contractor for revision and resubmission. In that event, it will be deemed that Contractor has not complied with this provision and Contractor shall bear risk of all delays to same extent as if it had not submitted any Shop Drawings or details.
- J. Submission of Shop Drawings (in either original submission or when resubmitted with correction) constitutes evidence that Contractor has checked all information thereon and that it accepts and is willing to perform Work as shown.
- K. Contractor shall pay for cost of any changes in construction due to improper checking and coordination. Contractor shall be responsible for all additional costs, including coordination. Contractor shall be responsible for costs incurred by itself, the District, the Architect, the Project Inspector, the Construction Manager, any other Subcontractor or contractor, etc., due to improperly checked and/or coordination of submittals.
- L. Shop Drawings must clearly delineate the following information:
 - (1) Project name and address.
 - (2) Specification number and description.
 - (3) Architect's name and project number.
 - (4) Shop Drawing title, number, date, and scale.
 - (5) Names of Contractor, Subcontractor(s) and fabricator.
 - (6) Working and erection dimensions.
 - (7) Arrangements and sectional views.
 - (8) Necessary details, including complete information for making connections with other Work.
 - (9) Kinds of materials and finishes.
 - (10) Descriptive names of materials and equipment, classified item numbers, and locations at which materials or equipment are to be installed in the Work. Contractor shall use same reference identification(s) as shown on Contract Drawings.

Contractor to review section
01 3300 as well as this
document

- M. Contractor shall prepare composite drawings and installation layouts when required to solve tight field conditions.
 - (1) Shop Drawings shall consist of dimensioned plans and elevations and must give complete information, particularly as to size and location of sleeves, inserts, attachments, openings, conduits, ducts, boxes, structural interferences, etc.
 - (2) Contractor shall coordinate these composite Shop Drawings and installation layouts in the field between itself and its Subcontractor(s) for proper relationship to the Work, the work of other trades, and the field conditions. The Contractor shall check and approve all submittal(s) before submitting them for final review.

1.04 PRODUCT DATA OR NON REPRODUCIBLE SUBMITTALS:

- A. Contractor shall submit manufacturer's printed literature in original form. Any fading type of reproduction will not be accepted. Contractor must submit a minimum of six (6) each, to the District. District shall return one (1) to the Contractor, who shall reproduce whatever additional copies it requires for distribution.
- B. Contractor shall submit six (6) copies of a complete list of all major items of mechanical, plumbing, and electrical equipment and materials in accordance with the approved Submittal Schedule, except as required earlier to comply with the approved Construction Schedule. Other items specified are to be submitted prior to commencing Work. Contractor shall submit items of like kind at one time in a neat and orderly manner. Partial lists will not be acceptable.
- C. Submittals shall include manufacturer's specifications, physical dimensions, and ratings of all equipment. Contractor shall furnish performance curves for all pumps and fans. Where printed literature describes items in addition to that item being submitted, submitted item shall be clearly marked on sheet and superfluous information shall be crossed out. If highlighting is used, Contractor shall mark all copies.
- D. Equipment submittals shall be complete and include space requirements, weight, electrical and mechanical requirements, performance data, and supplemental information that may be requested.
- E. Imported Materials Certification must be submitted at least ten (10) days before material is delivered.

1.05 SAMPLES:

- A. Contractor shall submit for approval Samples as required and within the time frame in the Contract Documents. Materials such as concrete, mortar, etc., which require on-site testing will be obtained from Project Site.
- B. Contractor shall submit four (4) samples except where greater or lesser number is specifically required by Contract Documents including, without limitation, the Specifications.

Contractor to review section
01 3300 as well as this
document

- (1) Samples must be of sufficient size and quality to clearly illustrate functional characteristics, with integrally related parts and attachment devices.
 - (2) Samples must show full range of texture, color, and pattern.
- C. Contractor shall make all Submittals, unless it has authorized Subcontractor(s) to submit and Contractor has notified the District in writing to this effect.
- D. Samples to be shipped prepaid or hand-delivered to the District.
- E. Contractor shall mark samples to show name of Project, name of Contractor submitting, Contract number and segment of Work where representative Sample will be used, all applicable Specifications Sections and documents, Contract Drawing Number and detail, and ASTM or FS reference, if applicable.
- F. Contractor shall not deliver any material to Site prior to receipt of District's and/or Architect's completed written review and approval. Contractor shall furnish materials equal in every respect to approved Samples and execute Work in conformance therewith.
- G. District's and/or Architect's review, acceptance, and/or approval of Sample(s) will not preclude rejections of any material upon discovery of defects in same prior to final acceptance of completed Work.
- H. After a material has been approved, no change in brand or make will be permitted.
- I. Contractor shall prepare its Submittal Schedule and submit Samples of materials requiring laboratory tests to specified laboratory for testing not less than ninety (90) days before such materials are required to be used in Work.
- J. Samples which are rejected must be resubmitted promptly after notification of rejection and be marked "Resubmitted Sample" in addition to other information required.
- K. Field Samples and Mock-Ups are to be removed by Contractor at District's direction:
 - (1) Size: As Specified.
 - (2) Furnish catalog numbers and similar data, as requested.

1.06 REVIEW AND RESUBMISSION REQUIREMENTS:

- A. The District will arrange for review of Sample(s), Shop Drawing(s), Product Data, and other submittal(s) by appropriate reviewer and return to Contractor as provided below within twenty-one (21) days after receipt or within twenty-one (21) days after receipt of all related information necessary for such review, whichever is later.
- B. One (1) copy of product or materials data will be returned to Contractor with the review status.

Contractor to review section
01 3300 as well as this
document

- C. Samples to be incorporated into the Work will be returned to Contractor, together with a written notice designating the Sample with the appropriate review status and indicating errors discovered on review, if any. Other Samples will not be returned, but the same notice will be given with respect thereto, and that notice shall be considered a return of the Sample.
- D. Contractor shall revise and resubmit any Sample(s), Shop Drawing(s), Product Data, and other submittal(s) as required by the reviewer. Such resubmittals will be reviewed and returned in the same manner as original Sample(s), Shop Drawing(s), Product Data, and other submittal(s), within fourteen (14) days after receipt thereof or within fourteen (14) days after receipt of all related information necessary for such review. Such resubmittal shall not delay the Work.
- E. Contractor may proceed with any of the Work covered by Sample(s), Shop Drawing(s), Product Data, and other submittal(s) upon its return if designated as no exception taken, or revise as noted, provided the Contractor proceeds in accordance with the District and/or the Architect's notes and comments.
- F. Contractor shall not begin any of the work covered by a Sample(s), Shop Drawing(s), Product Data, and other submittal(s), designated as revise and resubmit or rejected, until a revision or correction thereof has been reviewed and returned to Contractor.
- G. Sample(s), Shop Drawing(s), Product Data, and other submittal(s) designated as revise and resubmit or rejected and requiring resubmittal, shall be revised or corrected and resubmitted to the District no later than fourteen (14) days or a shorter period as required to comply with the approved Construction Schedule, after its return to Contractor.
- H. Neither the review nor the lack of review of any Sample(s), Shop Drawing(s), Product Data, and other submittal(s) shall waive any of the requirements of the Contract Documents, or relieve Contractor of any obligation thereunder.
- I. District's and/or Architect's review of Shop Drawings does not relieve the Contractor of responsibility for any errors that may exist. Contractor is responsible for the dimensions and design of adequate connections and details and for satisfactory construction of all the Work.

PART 2 – PRODUCTS Not Used.

PART 3 - EXECUTION Not Used.

END OF DOCUMENT

Melville Jacobson ES TK Portable Classroom Bldg
Tracy Unified School District

SUBMITTAL NO.:

Architect's Project # 3595001

DATE: _____

DSA File/Apl. # 39-73/02-122129

Re-Submittal of Original No.: _____

1. SUBMITTAL TRANSMITTAL

Attention: Affifa Kadhim

Contractor: Company

Contact: Name _____

HMC Architects

Sub Contractor:

Contact: _____

Please submit only one trade per submittal! Description of submitted materials:

Quantity submitted	Specification Section		Description of contents (e.g. product data, shop drawings, samples)
	Section #	Section Title	

Contractor Statement: (read and acknowledge)

This submittal has been reviewed and approved with respect to the means, methods, techniques, and procedures of construction, safety precautions, and program incidentals thereto. This submittal complies with the contract documents and comprises no variations thereto, unless accompanied by a substitution request.

By: _____
Name

Date: _____

2. RE-TRANSMITTAL TO CONTRACTOR:

Distribution: Contractor, Owner, Project Inspector, HMC, Other

- ☐ NO EXCEPTIONS TAKEN
☐ SUBMIT SPECIFIED ITEM

- ☐ REJECTED
☐ REVISE AND RESUBMIT

- ☐ FURNISH AS CORRECTED
☐ NO ACTION REQUIRED

Corrections or comments made on the shop drawings during this review do not relieve the Contractor from compliance with requirements of the Drawings and Specifications. This general check is only for the review of conformance with the design concept of the project and general compliance with the information given in the Contract Documents. The Contractor is responsible for confirming and correlating all quantities and dimensions, selecting fabrication processes and techniques of construction, coordinating his work with that of all the other trades, and performing his work in a safe and satisfactory manner.

HMC Architects

By: _____ Date: _____

Additional Comments:

See Specification Section 01 3300 for use of this form

Melville Jacobson ES TK Portable Classroom Bldg
Tracy Unified School District

**SUBSTITUTION
REQUEST NO.:**

Architect's Project # 3595001
DSA File/Appl. # 39-73/02-122129

Date: _____

1. SUBSTITUTION REQUEST

Attention: Affifa Kadhim

Contractor: Company _____

Contact: Name _____

HMC Architects

Please submit only one product per request!

Sub Contractor: _____

Include with a specified product Submittal

Contact: _____

2. PROPOSED SUBSTITUTIONS: The undersigned requests consideration of the following substitution:

Specified Item: _____ Page No.: _____ Paragraph No.: _____

Proposed Item: _____

3. REASON FOR REQUEST:

4. REQUIREMENTS FOR SUBSTITUTIONS:

Attached data includes product description, specifications, drawings, photographs, performance and test data adequate for evaluation of request; applicable portions of data are clearly identified. Attached data also includes a description of changes to Contract Documents, which proposed substitution will require for its proper installation.

The undersigned certifies that the following paragraphs, unless modified by attachments, are correct:

1. The proposed substitution does not affect dimensions shown on drawings and does not require design changes in the Contract Documents.
2. The undersigned will pay for changes to the building design, including engineering design, detailing and construction costs caused by the requested substitution.
3. The proposed substitution will have no adverse effect on the work, the schedule or specified warranty requirements.
4. Maintenance and service parts will be readily available for the proposed substitution.

The undersigned further states that the function, appearance and quality of the proposed substitution are equivalent or superior to the specified item.

Signature - Contractor/Subcontractor _____

Date _____

5. TRANSMITTAL TO CONTRACTOR:

Distribution: Contractor, Owner, Project Inspector, HMC, Other

☐ ACCEPTED

☐ ACCEPTED AS NOTED

☐ REJECTED

HMC Architects

By: _____

Date: _____

Comments:

Melville Jacobson ES TK Portable Classroom Bldg
Tracy Unified School District

RFI NO.:

Architect's Project # 3595001
DSA File/Apl. # 39-73/02-122129

Date: _____

1. REQUEST FOR INFORMATION

Attention: Affifa Kadhim

From:

Contractor:

Company _____

Contact:

Name _____

Sub Contractor:

Contact:

HMC Architects

Identify related specific references within the Contract Documents and supporting information:

Dwg./Document No.: _____

Building/Site Location: _____

2. Existing Condition (source / reason for the request):

3. Recommended Contractor Action(s) for resolution:

4. Project Inspector Acknowledgment:

Date Reviewed: _____

5. Owner / A/E Resolution(s):

Date of Response: _____ By: _____

Attachments: _____

Extra Work Involved in the Above Described Change?

Yes ☐

No ☐

Distribution: Contractor, Owner, Project Inspector, HMC, Other
See Specification Section 01300 for use of this form

Architect's Project # 3595001
DSA File/Appl. # 39-73/02-122129

Date: _____

1. ELECTRONIC DATA REQUEST

Attention: Affifa Kadhim

From: Contractor: Company

Contact: Name

HMC Architects

Sub Contractor:

Contact: _____

2. DATA REQUESTED - Provide list of specific drawings requested (include sheet numbers):

3. REASON FOR REQUEST - Provide clear explanation of why information is desired and for what purpose it will be utilized:

4. ACKNOWLEDGEMENT OF RESPONSIBILITY:

The electronic data files requested are distributed for reference only. Transferring such files can alter, delete or change original information. Accuracy of the data cannot be guaranteed as correct or complete and the Contractor accepts full responsibility for any and all inaccuracies, regardless of cause.

The hard copy documents, including addenda and subsequent written changes to the documents, represent the complete work of the contract and all electronic files should be cross-referenced and verified from that information as electronic files may not contain all contract information. It is the Contractor's responsibility to make any changes or revisions necessary.

This electronic data is furnished without guarantee of compatibility with your hardware or software. It is the Contractor's responsibility to notify the Architect in the event a compatibility problem or disk defect is encountered and a replacement disk is necessary.

This electronic data, in its present form, remains the property of HMC Architects and shall not be used for any other purpose than to provide background information for the project noted above. It is not to be released to any other party without the written consent of HMC Architects.

Accepted by: _____
Signature - Contractor/Subcontractor

Representing: _____
Contractor/Subcontractor Company Name

MEGGER GROUNDING TEST CERTIFICATE

This certifies that a Megger Grounding Test for the **Melville Jacobson Elementary School - TK Portable Classroom Building** for the **Tracy Unified** School District, of **San Joaquin** County, California was conducted on the _____ day of _____, **2024**, per CCR Title 24, Sections 200 H and J. The undersigned verifies that the resistance to ground was 25 ohms or less, as required, and is found to be acceptable.

Project Name: _____

DSA File No.: _____ DSA Application No.: _____

Address: _____

General Contractor's Signature: _____

Electrical Contractor's Signature: _____

Testing Agency's Signature: _____

District Inspector's Signature: _____

SEPARATE CERTIFICATE IS REQUIRED FOR EACH SITE

CERTIFICATION OF CHLORINATION AND STERILIZATION

This certifies that _____ chlorinated the domestic hot and cold water plumbing lines for the **Melville Jacobson Elementary School - TK Portable Classroom Building, Tracy Unified** School District. The lines were first flushed and chlorine was injected in the main water line on _____, **2024**. A minimum chlorine residual of 50 ppm was measured at each outlet. The lines were tagged, secured and the make-up water was shut off. On _____, **2024**, (a minimum of 24 hours later) the chlorine residual was retested and found to contain a minimum of 50 ppm. The plumbing lines were then thoroughly flushed with fresh water until the chlorine residual was not greater than 0.2 ppm at all outlets. A Bacteriological Examination report has been provided.

District Inspector Signature: _____

Date _____

Name of Chlorination and Testing Firm: _____

Authorized Representative Signature: _____

Date _____

Name of General Contractor: _____

Authorized Representative Signature: _____

Date _____

CERTIFICATION OF COMPLIANCE FOR BUILDING MATERIALS

This is to certify, in accordance with the Environmental Protection Agency requirements, that the materials and equipment used in the construction of the **Melville Jacobson Elementary School - TK Portable Classroom Building** for the **Tracy Unified** School District of **San Joaquin** County, California, are asbestos free and are, therefore, not subject to monitoring for asbestos contamination.

Project Name: _____

Address: _____

Contractor: _____

Address: _____

Signature: _____

Title: _____

Date: _____

SEPARATE CERTIFICATE IS REQUIRED FOR EACH SITE

SITE STANDARDS

PART 1 – GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including without limitation, Site Access, Conditions, and Regulations;
- B. Special Conditions;
- C. Drug-Free Workplace Certification;
- D. Tobacco-Free Environment Certification;
- E. Criminal Background Investigation/Fingerprinting Certification;
- F. Temporary Facilities and Controls.

1.02 REQUIREMENTS OF THE DISTRICT:

- A. Drug-Free Schools and Safety Requirements:
 - (1) All school sites and other District Facilities have been declared "Drug-Free Zones." No drugs, alcohol and/or smoking are allowed at any time in any buildings and/or grounds on District property. No students, staff, visitors, or contractors are to use drugs on these sites.
 - (2) Smoking and the use of tobacco products by all persons is prohibited on or in District property. District property includes school buildings, school grounds, school-owned vehicles and vehicles owned by others while on District property. Contractor shall post: "Non-Smoking Area" in a highly visible location in each work area, staging area, and parking area. Contractor may designate a smoking area outside of District property within the public right-of-way, provided that this area remains quiet and unobtrusive to adjacent neighbors. This smoking area is to be kept clean at all times.
 - (3) Contractor shall ensure that no alcohol, firearms, weapons, or controlled substances enter or are used at the Site. Contractor shall immediately remove from the Site and terminate the employment of any employee(s) found in violation of this provision.
- B. Language: Profanity or other unacceptable and/or loud language will not be tolerated, "Cat calls" or other derogatory language toward students, staff, volunteers, parents or public will not be allowed.

C. Disturbing the Peace (Noise and Lighting):

- (1) Contractor shall observe the noise ordinance of the Site at all times including, without limitation, all applicable local, city, and/or state laws, ordinances, and/or regulations regarding noise and allowable noise levels.
- (2) The use of radios, etc., shall be controlled to keep all sound at a level that cannot be heard beyond the immediate area of use. District reserves the right to prohibit the use of radios at the Site, except for mobile phones or other handheld communication radios.
- (3) If portable lights are used after dark, all light must be located so as not to direct light into neighboring property.

D. Traffic:

- (1) Driving on the Premises shall be limited to periods when students and public are not present. If driving or deliveries must be made during the school hours, two (2) or more ground guides shall lead the vehicle across the area of travel. In no case shall driving take place across playgrounds or other pedestrian paths during recess, lunch, and/or class period changes. The speed limit on-the Premises shall be five (5) miles per hour (maximum) or less if conditions require.
- (2) All paths of travel for deliveries, including without limitation, material, equipment, and supply deliveries, shall be reviewed and approved by District in advance. Any damage will be repaired to the pre-damaged condition by the Contractor.
- (3) District shall designate a construction entry to the Site. If Contractor requests, District determines it is required, and to the extent possible, District shall designate a staging area so as not to interfere with the normal functioning of school facilities. Location of gates and fencing shall be approved in advance with District and at Contractor's expense.
- (4) Parking areas shall be reviewed and approved by District in advance. No parking is to occur under the drip line of trees or in softscape areas that could otherwise be damaged.

- E. All of the above shall be observed and complied with by the Contractor and all workers on the Site. Failure to follow these directives could result in individual(s) being suspended or removed from the work force at the discretion of the District. The same rules and regulations shall apply equally to delivery personnel, inspectors, consultants, and other visitors to the Site.

PART 2 - PRODUCTS Not Used.

PART 3 - EXECUTION Not Used.

END OF DOCUMENT

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Special environmental, sustainable, and “green” building practices related to indoor air quality, resource efficiency supplementing the Pollutant Control requirements specified under Section 01 8113.10, Sustainable Design Requirements, and to ensure healthy indoor air quality in final Project.
- B. Contractor is required to comply with sustainable building practices during construction and when considering materials for substitutions. Refer to Article “Design Requirements.”

1.2 RELATED REQUIREMENTS

- A. Section 01 6116, Volatile Organic Compound (VOC) Restrictions.
- B. Section 01 50 13, Construction Waste Management and Disposal.
- C. Section 01 8113, Sustainable Design Requirements.

1.3 ADMINISTRATIVE REQUIREMENTS

- A. Submittal Procedures:
 - 1. Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
 - 2. Sustainable Design Submittals shall comply with the additional requirement of Section 01 8113, Sustainable Design Requirements.
 - 3. Closeout Submittals shall be submitted in accordance with document 01 7700, Closeout Procedures.

1.4 DESIGN REQUIREMENTS

- A. Owner has established general environmental goals for design and for construction of the Project.
 - 1. In addition to the Contractor, the Contractor’s construction team, including subcontractors, suppliers, and manufacturers, are encouraged to participate where possible to realize the Owner’s environmental goals.
 - 2. Intent is for environmental goals to be achieved in a manner which ultimately provides a safe and healthy environment for building occupants with minimal impact on the local, regional and global environment.
- B. Environmental Goals:
 - 1. Refer to specific Specifications Sections for more detailed construction requirements related to specific materials and systems.

ENVIRONMENTAL PROCEDURES
SECTION 01 3543
3595001

1.5 INFORMATIONAL SUBMITTALS

A. Indoor Air Quality (IAQ) Data:

1. Environmental Issues: Submit emission test data produced by acceptable testing laboratory, listed in this Specification Article "Quality Assurance," for materials as required in each specific Specification Section.
 - a. Laboratory reports shall contain emissions test data on Volatile Organic Compounds (VOCs) including Total Volatile Organic Compounds (TVOC), specific individual VOCs, formaldehyde and other aldehydes as described in this Section.
 - b. Identify VOCs emitted by each material as required in these Specifications, and demonstrate compliance with the California Green Building Standards Code, edition current as of the date of this Contract.
 - c. Specific test conditions and requirements are set forth in the Specifications. For required tests, submit documentation of sample acquisition, handling, and test specimen preparation, as well as test conditions, methods, and procedures. The tests consist of a 10-day conditioning period followed by a 96-hour test period.
 - 1) Samples collected during the test period at 24, 48, and 96-hours shall be analyzed for TVOC and formaldehyde.
 - 2) VOC samples collected at 96 hours shall be identified and quantified for compounds that are found on the list of Chemicals of Concern. The Chemicals of Concern list is based on the California OEHHA list as of September 2002 (The most recent list shall be used for this Specification as published at:
 - a) http://www.oehha.org/air/chronic_rels/allChrels.html.
2. Cleaning and Maintenance Products: Provide data on manufacturers' recommended maintenance, cleaning, refinishing and disposal procedures for materials and products. These procedures are for final Contractor cleaning of the project prior to Substantial Completion and for provided materials and products as required by the specific Specification Sections.
 - a. Where chemical products are recommended for these procedures, provide documentation to indicate that no component present in the cleaning product at more than 1 percent of the total mass of the cleaning product is a carcinogen or reproductive toxicant as identified in the Chemicals of Concern list referenced above.
 - b. Avoid cleaning products containing alpha-pinene, d-limonene or other unsaturated carbon double bond alkenes due to chemical reactions with ozone to form aldehydes, acidic aerosols, and ultra-fine particulate matter in indoor air.

B. Certificates:

1. Prior to Final Completion, submit a certificate signed by corporate office holder of Contractor, subcontractor, supplier, vendor, installer or manufacturer primarily responsible for the manufacturing of the product, indicating materials provided are

essentially the same, and contain essentially the same components as products and materials tested.

2. Comply with requirements specified in Specification Section 01 7700, Closeout Procedures.

1.6 CLOSEOUT SUBMITTALS

- A. Submit data relating to Environmental Issues.
 1. Submit environmental product certifications, in two forms:
 - a. Two CD-ROMs organized by CSI Division Format.
 - b. Three three-ring binders organized by CSI Division Format with Table of Contents and with dividers for each Division.

1.7 QUALITY ASSURANCE

- A. Environmental Project Management and Coordination: Contractor to identify one person on Contractor's staff to be responsible for environmental issues compliance and coordination.
 1. Experience: Environmental project manager shall have experience relating to sustainable building construction.
 2. Responsibilities: Carefully review the Contract Documents for environmental issues, coordinate work of trades, subcontractors, and suppliers; instruct workers relating to environmental issues; and oversee Project Environmental Goals.
 3. Meetings: Discuss Environmental Goals at following meetings.
 - a. Pre-construction meeting.
 - b. Pre-installation meetings.
 - c. Regularly scheduled job-site meetings.
 - d. Special sustainability issues meetings.
- B. Environmental Issues Criteria: Comply with requirements listed in the Specification Sections.
- C. Acceptable Indoor Air Emissions Testing Laboratories:
 1. Selection of testing laboratories shall include assessment of prior experience in conducting indoor source emissions tests.
 2. The proposed laboratory shall be an independent company or organization not related to the manufacturer of the products to be tested.
 3. Submit documentation on proposed laboratory for review and approval by Owner.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Packaging: Deliver materials in recyclable or in reusable packaging such as cardboard, wood, paper, or reusable blankets, which will be reclaimed by supplier or manufacturer for recycling.

ENVIRONMENTAL PROCEDURES

SECTION 01 3543

3595001

1. Minimize packaging materials to maximum extent possible while still ensuring protection of materials during delivery, storage, and handling.
 2. Unacceptable Packaging Materials: Polyurethane, polyisocyanate, polystyrene, polyethylene, and similar plastic materials such as “foam” plastics and “shrink-fit” plastics.
 3. Reusable Blankets: Deliver and store materials in reusable blankets and mats reclaimed by the manufacturers or suppliers for reuse where the reclamation program exists or where a program can be developed for such reuse.
 4. Pallets: Where pallets are used, suppliers shall be responsible to ensure pallets are removed from site for reuse or for recycling.
 5. Corrugated Cardboard and Paper: Where paper products are used, recycle as part of the construction waste management recycling program, or return to the material’s manufacturer for use by the manufacturer or supplier.
 6. Sealants, Paint, Primers, Adhesives, and Coating Containers: Return to the supplier or manufacturer for reuse where such program is available.
- B. Comply with the additional requirements specified in Section 01 7419, Construction Waste Management and Disposal.

1.9 FIELD CONDITIONS

- A. No smoking will be permitted in indoor Project site locations, in accordance with California Labor Code (Section 400-6413.5).
- B. Environmental Product Certification:
1. Include certification that indicates cleaning materials comply with requirements of these Specifications.
- C. Construction Ventilation and Preconditioning:
1. Temporary Construction Ventilation: Maintain sufficient temporary ventilation of areas where materials are being used that emit VOCs. Maintain ventilation continuously during installation, and until emissions dissipate following installation. If continuous ventilation is not possible utilizing the building’s HVAC system(s) then ventilation shall be supplied using open windows and temporary fans, sufficient to provide no less than three air changes per hour.
 - a. Period after installation shall be sufficient to dissipate odors and elevated concentrations of VOCs. Where no specific period is stated in these Specifications, a time period of 72 hours shall be used.
 - b. Ventilate areas directly to outside; ventilation to other enclosed areas is not acceptable.
 2. During dust producing activities, including drywall installation and finishing, turn ventilation system off, and openings in supply and return HVAC system shall be protected from dust infiltration. Provide temporary ventilation as required.
 3. Preconditioning: Prior to installation, allow products which have odors and significant VOC emissions to off-gas in dry, well-ventilated space for 14 calendar days to allow for reasonable dissipation of odors and emissions prior to delivery to Project site and installation.

- a. Condition products without containers and packaging to maximize off-gassing of VOCs
- b. Condition products in ventilated warehouse or other building. Comply with substitution requirements for consideration of other locations.

D. Protection:

- 1. Moisture Stains: Materials with evidence of moisture damage, including stains, are not acceptable, including both stored and installed materials; immediately remove from site and properly dispose.
 - a. Take special care to prevent an accumulation of moisture on installed materials and within packaging during delivery, storage, and handling to prevent development of molds and mildew on packaging and on products
 - b. Immediately remove from site and properly dispose of materials showing signs of mold and signs of mildew, including materials with moisture stains.
 - c. Replace moldy materials with new, undamaged materials.
- 2. Ducts: Seal ducts during transportation, delivery, and construction to prevent accumulation of construction dust and construction debris inside of ducts.

PART 2 - PRODUCTS

2.1 SUBSTITUTIONS

- A. Requests for substitutions shall comply with requirements specified in Specification Section 01 3300, Submittals, and with the following additional information required where environmental issues are specified:
 - 1. Indicate how each proposed substitution complies with requirements for VOCs.
 - 2. Owner, in consultation with Architect reserve the right to reject proposed substitutions where data for VOCs is not provided or where emissions of individual VOCs are higher than for the specified materials.
 - 3. Comply with the specified recycled content and other environmental requirements.

PART 3 - EXECUTION

3.1 FIELD QUALITY CONTROL

- A. Sequencing:
 - 1. On-Site Application: Where odorous and/or high VOC emitting products are applied on-site, apply prior to installation of porous and fibrous materials. Where this is not possible, protect porous materials with polyethylene vapor retarders.
 - 2. Complete interior finish material installation no less than 14 days prior to Substantial Completion to allow for Building Flush Out as described in Paragraph 3.1B.

ENVIRONMENTAL PROCEDURES

SECTION 01 3543

3595001

- B. Building Flush Out: Just prior to Substantial Completion, flush out building air continuously using maximum tempered outside air, or maximum amount of outside air while achieving reasonable indoor temperature, for at least 14 calendar days. Continuously is defined as 24 hours per day, 7 days a week. If interruptions of more than a few hours are required for testing and balancing purposes, extend flush out period accordingly in order to achieve the minimum 14 calendar day building flush out period.
 - 1. When Contractor is required to perform touch-up work, provide temporary construction ventilation during installation and extend building flush-out by a minimum of 4 calendar days after touch-up installation is complete with maximum tempered outside air for 24 hours per day.
 - 2. If construction schedule permits, extend flush-out period beyond minimum building flush out period for an additional 15 days.
 - 3. Return ventilation system to normal operation following flush-out period to minimize energy consumption.

3.2 CLEANING

- A. Clean interior and exterior surfaces exposed to view; remove temporary labels, stains, and foreign substances; polish transparent and glossy surfaces using cleaning and maintenance products that conform to standards as described in Part 1 of this Section.
- B. Clean equipment and fixtures to sanitary condition using cleaning and maintenance products that conform to standards as described in Part 1 of this Section.
- C. Products used for cleaning shall comply with Proposition 65 and the additional restrictions for volatile organic compounds specified in Section 01 6116.
- D. Vacuum carpeted and soft surfaces with high efficiency particulate arrestor (HEPA) vacuum.
- E. If ducts were not sealed during construction, and contain dust or dirt, clean ducts using HEPA vacuum immediately prior to Substantial Completion and prior to using ducts to circulate air. Oil film on sheet metal shall be removed before shipment to site. Ducts shall be inspected to confirm that no oil film is present. Remove oil film.
- F. Replace air filters, both pre and final filters, just prior to Substantial Completion.
- G. Remove and properly dispose of recyclable materials using construction waste management program described in Section 01 7419, Construction Waste Management and Disposal.

3.3 PROTECTION

- A. Protect interior materials from water intrusion or penetration where interior products are not intended for wet applications and are exposed to moisture.
- B. Protect installed products using methods that do not support growth of mold and mildew.
 - 1. Immediately remove from site materials with mold or mildew.

END OF SECTION

*p:\sacramento\3595 tracy unified school district\001-000_villalovoz es new shade structures\08 specifications\06 spec\04
final\jacobson\01 3543_environmental procedures.docx*

REGULATORY REQUIREMENTS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Obtaining of Permits, Licenses and Registrations and Work to Comply with All Applicable Laws and Regulations;
- B. Special Conditions; and
- C. Quality Control.

1.02 DESCRIPTION:

This section covers the general requirements for regulatory requirements pertaining to the Work and is supplementary to all other regulatory requirements mentioned or referenced elsewhere in the Contract Documents.

1.03 REQUIREMENTS OF REGULATORY AGENCIES:

- A. All statutes, ordinances, laws, rules, codes, regulations, standards, and the lawful orders of all public authorities having jurisdiction over the Work, are hereby incorporated into these Contract Documents as if repeated in full herein and are intended to be included in any reference to Code or Building Code, unless otherwise specified, including, without limitation, the references in the list below. Contractor shall make available at the Site copies of all the listed documents applicable to the Work as the District and/or Architect may request, including, without limitation, applicable portions of the California Code of Regulations ("CCR").
 - (1) California Building Standards Administrative Code, Part 1, Title 24, CCR.
 - (2) California Building Code (CBC), Part 2, Title 24, CCR; (International Building Code volumes 1-2 and California Amendments).
 - (3) California Electrical Code (CEC), Part 3, Title 24, CCR; (National Electrical Code and California Amendments).
 - (4) California Mechanical Code (CMC), Part 4, Title 24, CCR; (Uniform Mechanical Code and California Amendments).
 - (5) California Plumbing Code (CPC), Part 5, Title 24, CCR; (Uniform Plumbing Code and California Amendments).

- (6) California Fire Code (CFC), Part 9, Title 24, CCR; (International Fire Code and California Amendments).
- (7) California Green Building Standards Code (CALGreen), Part 11, Title 24, CCR.
- (8) California Referenced Standards Code, Part 12, Title 24, CCR.
- (9) State Fire Marshal Regulations, Public Safety, Title 19, CCR.
- (10) Partial List of Applicable National Fire Protection Association (NFPA) Standards:
 - (a) NFPA 13 - Automatic Sprinkler System.
 - (b) NFPA 14 - Standpipes Systems.
 - (c) NFPA 17A - Wet Chemical System
 - (d) NFPA 24 - Private Fire Mains.
 - (e) (California Amended) NFPA 72 - National Fire Alarm Codes.
 - (f) NFPA 253 - Critical Radiant Flux of Floor Covering System.
 - (g) NFPA 2001 - Clean Agent Fire Extinguishing Systems.
- (11) California Division of the State Architect interpretation of Regulations ("DSA IR"), including, without limitation:
 - (a) DSA IR A-6 — Construction Change Document Submittal and Approval Processes.
 - (b) DSA IR A-7 — Project Inspector Certification and Approval.
 - (c) DSA IR A-8 — Project Inspector and Assistant Inspector Duties and Performance.
 - (d) DSA IR A-12 — Assistant Inspector Approval.
- (12) DSA Procedures ("DSA PR")
 - (a) DSA PR 13-01 – Construction Oversight Process
 - (b) DSA PR 13-02 – Project Certification Process

B. This Project shall be governed by applicable regulations, including, without limitation, the State of California's Administrative Regulations for the Division of the State Architect-Structural Safety (DSA/SS), Chapter 4, Part 1, Title 24, CCR, and the most current version on the date the bids are opened and as it pertains to school construction including, without limitation:

- (1) Test and testing laboratory per Section 4-335. District shall pay for the testing laboratory.
- (2) Special inspections per Section 4-333(c).
- (3) Deferred Approvals per section 4-317(g).
- (4) Verified reports per Sections 4-336 & 4-343(c).
- (5) Duties of the Architect & Engineers shall be per Sections 4-333(a) and 4-341.
- (6) Duties of the Contractor shall be per Section 4-343.
- (7) Duties of Project Inspector shall be per Section 4-334.
- (8) Addenda and Construction Change Documents per Section 4-338.

Contractor shall keep and make available all applicable parts of the most current version of Title 24 referred to in the plans and specifications at the Site during construction.

C. Items of deferred approval shall be clearly marked on the first sheet of the Architect's and/or Engineer's approved Drawings. All items later submitted for approval shall be per Title 24 requirements to the DSA.

- (1) Contractor shall submit the following to Architect for review and endorsement:
 - (a) Product information on proposed material/system supplier.
 - (b) Drawings, specifications, and calculations prepared, signed, and stamped by an architect or engineer licensed in the State of California for that portion of the Work.
 - (c) All other requirements as may be required by DSA.
- (2) Cost of preparing and submitting documentation per DSA Deferred Approval requirements including required modifications to Drawings and Specifications, whether or not indicated in the Contract Documents, shall be borne by Contractor.
- (3) Contractor shall not begin fabrication and installation of deferred approval items without first obtaining DSA approval of Drawings and Specifications.
- (4) Schedule of Work Subject to DSA Deferred Approval: Window wall systems exceeding 10 feet in span.

PART 2 – PRODUCTS Not Used.

PART 3 – EXECUTION Not Used.

END OF DOCUMENT

ABBREVIATIONS AND ACRONYMS

PART 1 – GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions including without limitation, Definitions;
- B. Special Conditions.

1.02 DOCUMENT INCLUDES:

- A. Abbreviations used throughout the Contract Documents.
- B. Reference to a technical society, organization, or body is by abbreviation, as follows:

1.	AA	The Aluminum Association
2.	AASHTO	American Association of State Highway and Transportation Officials
3.	ABPA	Acoustical and Board Products Association
4.	ACI	American Concrete Institute
5.	AGA	American Gas Association
6.	AGC	Associated General Contractors of America
7.	AHC	Architectural Hardware Consultant
8.	AHRI	Air Conditioning, Heating, Refrigeration Institute
9.	AI	Asphalt Institute
10.	AIA	American Institute of Architects
11.	AISC	American Institute of Steel Construction
12.	AISI	American Iron and Steel Institute
13.	AMCA	Air Movement and Control Association
14.	ANSI	American National Standards Institute
15.	APA	APA – The Engineered Wood Association
16.	ASCE	American Society of Civil Engineers
17.	ASHRAE	American Society of Heating, Refrigeration and Air Conditioning Engineers
18.	ASME	American Society of Mechanical Engineers
19.	ASTM	American Society of Testing and Materials International
20.	AWPA	American Wood Protection Association
21.	AWPI	American Wood Preservers Institute
22.	AWS	American Welding Society
23.	AWSC	American Welding Society Code
24.	AWI	Architectural Woodwork Institute
25.	AWWA	American Water Works Association
26.	BIA	The Brick Industry Association

27.	CCR	California Code of Regulations
28.	CLFMI	Chain Link Fence Manufacturers Institute
29.	CRA	California Redwood Association
30.	CRSI	Concrete Reinforcing Steel Institute
31.	CS	Commercial Standards
32.	CSI	Construction Specifications Institute
33.	CTI	Cooling Technology Institute
34.	FGIA	Fenestration and Glazing Industry Alliance
35.	FGMA	Flat Glass Manufacturers' Association
36.	FIA	Factory Insurance Association
37.	FM	Factory Mutual Global
38.	FS/FED SPEC	Federal Specification
39.	FTI	Facing Title Institute
40.	GA	Gypsum Association
41.	IAPMO	International Association of Plumbing and Mechanical Officials
42.	ICC	International Code Council
43.	IEEE	Institute of Electrical and Electronics Engineers
44.	IES	Illuminating Engineering Society
45.	MCAC	Mason Contractors Association of California
46.	MIMA	Mineral Wool Insulation Manufacturers Association
47.	MLMA	Metal Lath Manufacturers Association
48.	MS/MIL SPEC	Military Specifications
49.	NAAMM	National Association of Architectural Metal Manufacturers
50.	NBHA	National Builders Hardware Association
51.	NCMA	National Concrete Masonry Association
52.	NCSEA	National Council of Structural Engineers Associations
53.	NEC	National Electrical Code
54.	NEMA	National Electrical Manufacturers Association
55.	NIST	National Institute of Standards and Technology
56.	NSI	Natural Stone Institute
57.	NTMA	National Terrazzo and Mosaic Association, Inc.
58.	ORS	Office of Regulatory Services (California)
59.	OSHA	Occupational Safety and Health Act
60.	PCI	Precast/Prestressed Concrete Institute
61.	PCA	Portland Cement Association
62.	PCA	Painting Contractors Association
63.	PDI	Plumbing Drainage Institute
64.	PEI	Porcelain Enamel Institute, Inc.
65.	PG&E	Pacific Gas & Electric Company
66.	PS	Product Standards
67.	SDI	Steel Door Institute; Steel Deck Institute
68.	SJI	Steel Joist Institute
69.	SSPC	Society for Protective Coatings
70.	TCNA	Tile Council of North America, Inc.
71.	TPI	Truss Plate Institute
72.	UBC	Uniform Building Code
73.	UL	Underwriters Laboratories Code

74.	UMC	Uniform Mechanical Code
75.	USDA	United States Department of Agriculture
76.	VI	Vermiculite Institute
77.	WCLIB	West Coast Lumber Inspection Bureau
78.	WDMA	Window and Door Manufacturers Association
79.	WEUSER	Western Electric Utilities Service Engineering Requirements
80.	WIC	Woodwork Institute of California

PART 2 - PRODUCTS Not Used.

PART 3 - EXECUTION Not Used.

END OF DOCUMENT

DEFINITIONS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions including without limitation, Definitions;
- B. Special Conditions.

1.02 QUALITY ASSURANCE

- A. For products or workmanship specified by association, trade, or Federal Standards, Contractor shall comply with requirements of the standard, except when more rigid requirements are specified in the Contract Documents, or are required by applicable codes.
- B. Contractor shall conform to current reference standard publication date in effect on the date of bid opening.
- C. Contractor shall obtain copies of standards unless specifically required not to by the Contract Documents.
- D. Contractor shall maintain a copy of all standards at jobsite during submittals, planning, and progress of the specific Work, until final completion, unless specifically required not to by the Contract Documents.
- E. Should specified reference standards conflict with Contract Documents, Contractor shall request clarification from the District and/or the Architect before proceeding.
- F. The contractual relationship of the parties to the Contract shall not be altered from the contractual relationship as indicated in the Contract Documents by mention or inference otherwise in any referenced document.
- G. Governing Codes shall be as shown in the Contract Documents including, without limitation, the Specifications.

END OF DOCUMENT

REFERENCES**PART 1 - GENERAL****1.01 SCHEDULE OF REFERENCES:**

The following information is intended only for the general assistance of the Contractor, and the District does not represent that all of the information is current. It is the Contractor's responsibility to verify the correct information for each of the entities listed.

AA	The Aluminum Association 1400 Crystal Drive, Suite 430 Arlington, VA 22202 www.aluminum.org	703/358-2960
AABC	Associated Air Balance Council 2401 Pennsylvania Avenue NW, Suite 330 Washington, DC 20037 www.aabc.com	202/737-0202
AASHTO	American Association of State Highway and Transportation Officials 555 12th St. NW - Suite 1000 Washington, DC 20004 www.transportation.org	202/624-5800
AATCC	American Association of Textile Chemists and Colorists P.O. Box 12215 Research Triangle Park, NC 27709-2215 www.aatcc.org	919/549-8141
ACA	American Coatings Association 901 New York Ave., NW, Suite 300 West Washington, DC 20001 www.paint.org	202/462-6272
ACI	American Concrete Institute 38800 Country Club Dr. Farmington Hills, MI 48331-3439 www.concrete.org	248/848-3800
ACPA	American Concrete Pipe Association 5605 N. MacArthur Blvd., Suite 340 Irving, TX 75038 www.concrete-pipe.org	972/506-7216

ADC	Air Duct Council 1901 N. Roselle Road, Suite 800 Schaumburg, IL 60195 www.flexibleduct.org	847/706-6750
AF&PA	American Forest and Paper Association 1101 K Street, NW, Suite 700 Washington, DC 20005 www.afandpa.org	202/463-2700
AGA	American Gas Association 400 North Capitol Street, NW, Suite 450 Washington, DC 20001 www.aga.org	202/824-7000
AGC	Associate General Contractors of America 2300 Wilson Blvd., Suite 300 Arlington, VA 22201 www.agc.org	703/548-3118
AHA	American Hardboard Association 1210 West Northwest Highway Palatine, IL 60067 http://domensino.com/AHA/default.htm	847/934-8800
AI	Asphalt Institute 2696 Research Park Drive Lexington, KY 40511-8480 www.asphaltinstitute.org	859/288-4960
AIA	The American Institute of Architects 1735 New York Ave., NW Washington, DC 20006-5292 www.aia.org	202/626-7300
AISC	American Institute of Steel Construction 130 East Randolph Street, Suite 2000 Chicago, IL 60601 www.aisc.org	312.670.2400
AISI	American Iron and Steel Institute 25 Massachusetts Ave., NW, Suite 800 Washington, DC 20001 www.steel.org	202/452-7100
AITC	American Institute of Timber Construction 1010 South 336th Street, #210 Federal Way, WA 98003-7394 https://www.plib.org/aitc/	253/835-3344

ALI	Associated Laboratories, Inc. P.O. Box 152837 Dallas, TX 75315 www.assoc-labs.com	214/565-0593
ALSC	American Lumber Standards Committee, Inc. 7470 New Technology Way, Suite F Frederick, MD 21703 www.alsc.org	301/972-1700
AMCA	Air Movement and Control Association International, Inc. 30 W. University Drive Arlington Heights, IL 60004 www.amca.org	847/394-0150
AMPP (formerly SSPC)	Association for Materials Protection and Performance (merger of Society for Protective Coatings and National Association of Corrosion Engineers International) (formerly Steel Structures Painting Council) 800 Trumbull Drive Pittsburgh, PA 15205 www.sspc.org	412/281-2331 877/281-7772
ANLA	AmericanHort (merger of American Nursery & Landscape Association and OFA – The Association of Horticultural Professionals) 2130 Stella Court Columbus, OH 43215 www.americanhort.org	614/487-1117
ANSI	American National Standards Institute 1899 L Street, NW, 11th Floor Washington, DC 20036 www.ansi.org	202/293-8020
APA	APA-The Engineered Wood Association 7011 S. 19th Street Tacoma, WA 98466-5333 www.apawood.org	253/565-6600

APA	Architectural Precast Association 325 John Knox Rd, Suite L-103 Tallahassee, FL 32303 www.archprecast.org	850/205-5637
APCIA	American Property Casualty Insurance Association (merger of American Insurance Association (formerly the National Board of Fire Underwriters) with the Property Casualty Insurers Association of America) 555 12th St, NW, Suite 550 Washington DC 20004 www.apci.org	202/828-7100
AHRI	Air Conditioning and Refrigeration Institute (now Air-Conditioning, Heating, & Refrigeration Institute) 2311 Wilson Blvd, Suite 400 Arlington, VA 22201 www.ahrinet.org	703/524-8800
ARMA	Asphalt Roofing Manufacturers Association 2331 Rock Spring Road Forest Hill, MD 21050 www.asphaltroofing.org	443/640-1075
ASA	The Acoustical Society of America Suite 300 1305 Walt Whitman Road Melville, NY 11747-4300 https://acousticalsociety.org/	516/576-2360
ASCE	American Society of Civil Engineers 1801 Alexander Bell Drive Reston, VA 20191 www.asce.org	800/548-2723 703/295-6300
ASHRAE	American Society of Heating, Refrigerating and Air Conditioning Engineers 180 Technology Parkway Peachtree Corners, GA 30092 www.ashrae.org	800/527-4723 404/636-8400
ASLA	American Society of Landscape Architects 636 Eye Street, NW Washington, DC 20001-3736 www.asla.org	202/898-2444
ASME	American Society of Mechanical Engineers Two Park Avenue New York, NY 10016-5990 www.asme.org	800/834-2763

ASPE	American Society of Plumbing Engineers 6400 Shafer Court, Suite 350 Rosemont, IL 60018 http://aspe.org	847/296-0002
ASQ	American Society for Quality P.O. Box 3005 Milwaukee, WI 53201-3005 or 600 North Plankinton Avenue Milwaukee, WI 53203 http://asq.org	800/248-1946 414/272-8575
ASSE	American Society of Sanitary Engineering 18927 Hickory Creek Dr., Suite 220 Mokena, IL 60448 www.asse-plumbing.org	708/995-3019
ASTM	ASTM International 100 Barr Harbor Drive PO Box C700 West Conshohocken, PA, 19428-2959 www.astm.org	610/832-9500
AWCI	Association of the Wall and Ceiling Industry 513 West Broad Street, Suite 210 Falls Church, VA 22046 www.awci.org	703/538-1600
AWPA	American Wood Protection Association (formerly American Wood Preservers Institute) P.O. Box 361784 Birmingham, AL 35236-1784 www.awpa.com	205/733-4077
AWS	American Welding Society 8669 NW 36 Street, Suite 130 Miami, FL 33166 www.aws.org	800/443-9353 305/443-9353
AWI	Architectural Woodwork Institute 46179 Westlake Drive, Suite 120 Potomac Falls, VA 20165-5874 www.awinet.org	571/323-3636
AWWA	American Water Works Association 6666 West Quincy Avenue Denver, CO 80235 www.awwa.org	800/926-7337 303/794-7711

BHMA	Builders Hardware Manufacturers Association 355 Lexington Avenue, 15th Floor New York, NY 10017 www.buildershardware.com	212/297-2122
BIA	The Brick Industry Association 12007 Sunrise Valley Drive, Suite 430 Reston, VA 20191 www.gobrick.com	703/620-0010
CGA	Compressed Gas Association 8484 Westpark Drive, Suite 220 McLean, VA 22102 www.cganet.com	703/788-2700
CISCA	Ceilings & Interior Systems Construction Association 1010 Jorie Blvd, Suite 30 Oak Brook, IL 60523 www.cisca.org	630/584-1919
CISPI	Cast Iron Soil Pipe Institute 2401 Fieldcrest Dr. Mundelein, IL 60060 www.cispi.org	224/864-2910
CLFMI	Chain Link Fence Manufacturers Institute 10015 Old Columbia Road, Suite B-215 Columbia, MD 21046 chainlinkinfo.org	301/596-2583
CPA	Composite Panel Association 19465 Deerfield Avenue, Suite 306 Leesburg, VA 20176 www.compositepanel.org	703/724-1128
CPSC	Consumer Product Safety Commission 4330 East-West Highway Bethesda, MD 20814 www.cpsc.gov	800/638-2772
CRA	California Redwood Association 818 Grayson Road, Suite 201 Pleasant Hill, CA 94523 www.calredwood.org	925/935-1499

CRI	Carpet and Rug Institute 100 S. Hamilton Street Dalton, GA 30722-2048 www.carpet-rug.org	706/278-3176
CRSI	Concrete Reinforcing Steel Institute 933 N. Plum Grove Road Schaumburg, IL 60173-4758 www.crsi.org	847/517-1200
CSI	The Construction Specifications Institute 123 North Pitt St, Suite 450 Alexandria, VA 22314 www.csinet.org	800/689-2900
CTIOA	Ceramic Tile Institute of America 12061 Jefferson Blvd. Culver City, CA 90230-6219 www.ctioa.org	310/574-7800
DHA	Decorative Hardwoods Association (formerly Hardwood Plywood & Veneer Association) 42777 Trade West Dr. Sterling, VA 20166 https://www.decorativehardwoods.org/	703/435-2900
DHI	Door and Hardware Institute (formerly National Builders Hardware Association) 2001 K Street NW, 3rd Floor North Washington, DC 20006 www.dhi.org	202/367-1134
DIPRA	Ductile Iron Pipe Research Association P.O. Box 190306 Birmingham, AL 35219 www.dipra.org	205/402-8700
DOC	U.S. Department of Commerce 1401 Constitution Ave., NW Washington, DC 20230 www.commerce.gov	202/482-2000
DOT	U.S. Department of Transportation 1200 New Jersey Avenue, SE Washington, DC 20590 www.dot.gov	855/368-4200
EJMA	Expansion Joint Manufacturers Association, Inc. 25 North Broadway Tarrytown, NY 10591 www.ejma.org	914/332-0040

EPA	Environmental Protection Agency Ariel Rios Building 1200 Pennsylvania Avenue, N.W. Washington, DC 20460 www.epa.gov	202/272-0167
FCICA	Floor Covering Installation Contractors Association 800 Roosevelt Rd., Bldg. C, Suite 312 Glen Ellyn, IL 60137 www.fcica.com	630/672-3702
FGIA	Fenestration and Glazing Industry Alliance 1900 E Golf Rd, Suite 1250 Schaumburg, IL 60173 https://fgiaonline.org/	847/303-5664
FM Global	Factory Mutual Insurance Company Amy Daley Global Practice Leader – Education, Public Entities, Health Care FM Global 270 Central Avenue Johnston, RI 02919-4949 www.fmglobal.com	401/275-3000 401/275-3029
FS	General Services Administration (GSA) Index of Federal Specifications, Standards and Commercial Item Descriptions 470 East L'Enfant Plaza, SW, Suite 8100 Washington, DC 20407 www.gsa.gov	202/619-8925
GA	The Gypsum Association 962 Wayne Ave., Suite 620 Silver Spring, MD 20910 www.gypsum.org	301/277-8686
HMA	Hardwood Manufacturers Association One Williamsburg Place, Suite 108 Warrendale, PA 15086 http://hmamembers.org	412/244-0440

IAPMO	International Association of Plumbing and Mechanical Officials (formerly the Western Plumbing Officials Association) 4755 E. Philadelphia St. Ontario, CA 91761 www.iapmo.org	909/472-4100
ICC	International Code Council 500 New Jersey Avenue, NW, 6th Floor Washington, DC 20001 www.iccsafe.org	888/422-7233
IEEE	Institute of Electrical and Electronics Engineers 3 Park Avenue, 17th Floor New York, NY 10016-5997 www.ieee.org	212/419-7900
IES	Illuminating Engineering Society 120 Wall Street, Floor 17 New York, NY 10005-4001 www.ies.org	212/248-5000
ITRK	Intertek Testing Services 3933 US Route 11 Cortland, NY 13045 www.intertek.com	607/753-6711
MCAA	Mechanical Contractors Association of America 1385 Piccard Drive Rockville, MD 20850 www.mcaa.org	301/869-5800
MMPA (formerly WMMPA)	Moulding & Millwork Producers Association (formerly Wood Moulding & Millwork Producers Association) 507 First Street Woodland, CA 95695 www.wmmpa.com	530/661-9591 800/550-7889
MSS	Manufacturers Standardization Society (MSS) of the Valve and Fittings Industry, Inc. 127 Park Street, NE Vienna, VA 22180-4602 http://mss-hq.org	703/281-6613
NAAMM	National Association of Architectural Metal Manufacturers 800 Roosevelt Rd. Bldg. C, Suite 312 Glen Ellyn, IL 60137 www.naamm.org	630/942-6591

NAIMA	North American Insulation Manufacturers Association P.O. Box 1906 Alexandria, VA 22313 https://insulationinstitute.org/	703/684-0084
NALP	National Association of Landscape Professionals (formerly Professional Landcare Network) 12500 Fair Lakes Circle, Suite 200 Fairfax, VA 22033 https://www.landscapeprofessionals.org/	703/736-9666
NAPA	National Asphalt Pavement Association 6406 Ivy Lane, Suite 350 Greenbelt, MD 20770-1441 www.asphaltpavement.org	888/468-6499 301/731-4748
NCSPA	National Corrugated Steel Pipe Association 14070 Proton Road, Suite 100 Dallas, TX 75244 www.ncspa.org	972/850-1907
NCMA	National Concrete Masonry Association 13750 Sunrise Valley Drive Herndon, VA 20171-4662 www.ncma.org	703/713-1900
NEBB	National Environmental Balancing Bureau 8575 Grovemont Circle Gaithersburg, MD 20877 www.nebb.org	301/977-3698
NECA	National Electrical Contractors Association 1201 Pennsylvania Ave. NW Washington, D.C., 20004 www.necanet.org	202/991-6300
NEMA	National Electrical Manufacturers Association 1300 North 17th Street N, Suite 900 Rosslyn, VA 22209 www.nema.org	703/841-3200
NEII	National Elevator Industry, Inc. 5537 SW Urish Road Topeka, KS 66610 https://nationalelevatorindustry.org/	703/589-9985
NFPA	National Fire Protection Association 1 Batterymarch Park Quincy, MA 02169-7471 www.nfpa.org	800/344-3555 855/274-8525

NGA (formerly GANA)	National Glass Association (merged with Glass Association of North America) 1945 Old Gallows Road Suite 750 Vienna, VA 22182 www.glass.org	866/342-5642 Ext 127
NHLA	National Hardwood Lumber Association PO Box 34518 Memphis, TN 38184 www.nhla.com	901/377-1818
NIA	National Insulation Association 516 Herndon Pkwy., Ste. D Herndon, VA 20170 www.insulation.org	703/464-6422
NRCA	National Roofing Contractors Association 10255 W. Higgins Road, Suite 600 Rosemont, IL 60018-5607 www.nrca.net	847/299-9070
NSF	NSF International 789 N. Dixboro Road Ann Arbor, MI 48113-0140 www.nsf.org	800/673-6275 734/769-8010
NSI	Natural Stone Institute (formerly Marble Institute of America) 380 E. Lorain St. Oberlin, OH 44074 https://www.naturalstoneinstitute.org/	440/250-9222
NTMA	National Terrazzo and Mosaic Association 209 N. Crockett Street, Suite 2 PO Box 2605 Fredericksburg, TX 78624 www.ntma.com	800/323-9736
OSHA	Occupational Safety and Health Act U.S. Department of Labor Occupational Safety & Health Administration 200 Constitution Ave., NW Washington, DC 20210 www.osha.gov	800/321-OSHA (6742)

PCA	Portland Cement Association 5420 Old Orchard Road Skokie, IL 60077 or 200 Massachusetts Ave NW, Suite 200 Washington, DC 20001 www.cement.org	847/966-6200 202/408-9494
PCA	Painting Contractors Association (formerly Painting and Decorating Contractors of America) 2316 Millpark Drive Maryland Heights, MO 63043 https://www.pcapainted.org/	800/322-7322
PCI	Precast/Prestressed Concrete Institute 8770 W. Bryn Mawr Ave., Suite 1150 Chicago, IL 60631 www.pci.org	312/786-0300
PDI	Plumbing & Drainage Institute 800 Turnpike Street, Suite 300 North Andover, MA 01845 http://pdionline.org	978/557-0720 800/589-8956
PEI	Porcelain Enamel Institute, Inc. P.O. Box 920220 Norcross, GA 30010 www.porcelainenamel.com	770/676-9366
PG&E	Pacific Gas & Electric Company P.O. Box 997300 Sacramento, CA 95899-7300 www.pge.com	800/743-5000
PLIB	Pacific Lumber Inspection Bureau (formerly West Coast Lumber Inspection Bureau) 1010 South 336th Street, Suite 210 Federal Way, WA 98003-7394 https://www.plib.org/	253/835-3344
RFCI	Resilient Floor Covering Institute 115 Broad Street, Suite 201 La Grange, GA 30240 www.rfci.com	706/882-3833
SDI	Steel Deck Institute P.O. Box 426 Glenshaw, PA 15116 www.sdi.org	412/487-3325

SDI	Steel Door Institute 30200 Detroit Road Westlake, OH 44145 www.steeldoor.org	440/899-0010
SJI	Steel Joist Institute 140 West Evans Street, Suite 203 Florence, SC 29501 http://steeljoist.org	843/407-4091
SMA	Stucco Manufacturers Association 5753 E Santa Ana Cyn Rd, #G-156 Anaheim, CA 92807 www.stuccomfgassoc.com	714/473-9579
SMACNA	Sheet Metal and Air Conditioning Contractors' National Association 4201 Lafayette Center Drive Chantilly, VA 20151-1219 www.smacna.org	703/803-2980
SPI	SPI: The Plastics Industry Trade Association, Inc. 1425 K St. NW, Suite 500 Washington, DC 20005 www.plasticsindustry.org	202/974-5200
TCA	The Tile Council of North America 100 Clemson Research Blvd. Anderson, SC 29625 www.tcnatile.com	864/646-8453
TPI	Truss Plate Institute 2670 Crain Highway, Suite 203 Waldorf, MD 20601 www.tpinst.org	240/587-5582
TPI	Turfgrass Producers International 444 E. Roosevelt Road #346 Lombard, IL 60148 www.turfgrasssod.org	800/405-8873 847/649-5555
TCIA	Tree Care Industry Association (formerly the National Arborist Association) 670 N Commercial Street, Suite 201 Manchester, NH 03101 www.tcia.org	603/314-5380 800/733-2622

TVI	The Vermiculite Institute c/o The Schundler Company 10 Central Street Nahant, MA 01908 www.vermiculiteinstitute.org	732/287-2244
UL	Underwriters Laboratories Inc. 333 Pfingsten Road Northbrook, IL 60062-2096 www.ul.com	847/272-8800 877/854-3577
UNI	Uni-Bell PVC Pipe Association 201 E. John Carpenter Freeway, Suite 750 Irving, TX 75062 www.uni-bell.org	972/243-3902
USDA	U.S. Department of Agriculture 1400 Independence Ave., S.W. Washington, DC 20250 www.usda.gov	202/720-2791
WA	Wallcoverings Association 35 E Wacker Dr., Suite 850 Chicago, IL 60601 www.wallcoverings.org	312/224-2574
WCMA	Window Covering Manufacturers Association 355 Lexington Avenue 15th Floor New York, NY 10017 www.wcmanet.org	212/297-2122
WDMA	Window & Door Manufacturers Association 2001 K Street NW, 3rd Floor North Washington, D.C. 20006 www.wdma.com	202/367-1157
WI	Woodwork Institute 1455 Response Road, Suite 110 Sacramento, CA 95815 www.wicnet.org	916/372-9943
WRI	Wire Reinforcement Institute 942 Main Street, Suite 300 Hartford, CT 06103 www.wirereinforcementinstitute.org	860/240-9545
WWCA	Western Wall & Ceiling Contractors Association 1910 N. Lime St. Orange, CA 92865 www.wwcca.org	714/221-5520

WWPA	Western Wood Products Association (formerly Redwood Inspection Service) 1500 SW First Ave., Suite 870 Portland, OR 97201 www.wwpa.org	503/224-3930
------	--	--------------

PART 2 - PRODUCTS Not Used.

PART 3 - EXECUTION Not Used.

END OF DOCUMENT

MATERIALS AND EQUIPMENT

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Purchase of Materials and Equipment;
- B. Special Conditions;
- C. Imported Materials Certification.

1.02 MATERIAL AND EQUIPMENT

- A. Only items approved by the District and/or Design Professional shall be used.
- B. Contractor shall submit lists of products and other product information in accordance with the Contract Documents, including, without limitation, the provisions regarding the submittals.

1.03 MATERIAL AND EQUIPMENT COLORS

- A. The District and/or Architect will provide a schedule of colors.
- B. No individual color selections will be made until after approval of all pertinent materials and equipment and after receipt of appropriate samples in accordance with the Contract Documents, including, without limitation, the provisions regarding the submittals.
- C. Contractor shall request priority in writing for any item requiring advance ordering to maintain the approved Construction Schedule.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. Contractor shall deliver manufactured materials in original packages, containers, or bundles (with seals unbroken), bearing name or identification mark of manufacturer.
- B. Contractor shall deliver fabrications in as large assemblies as practicable; where specified as shop-primed or shop-finished, package or crate as required to preserve such priming or finish intact and free from abrasion.
- C. Contractor shall store materials in such a manner as necessary to properly protect them from damage. Materials or equipment damaged by handling, weather, dirt, or from any other cause will not be accepted.

- D. Materials are not acceptable that have been warehoused for long periods of time, stored or transported in improper environment, improperly packaged, inadequately labeled, poorly protected, excessively shipped, deviated from normal distribution pattern, or reassembled.
- E. Contractor shall store material so as to cause no obstructions of sidewalks, roadways, access to the Site or buildings, and underground services. Contractor shall protect material and equipment furnished under Contract.
- F. Contractor may store materials on Site with prior written approval by the District, all material shall remain under Contractor's control and Contractor shall remain liable for any damage to the materials. Should the Project Site not have storage area available, the Contractor shall provide for off-site storage at a bonded warehouse and with appropriate insurance coverage at no cost to District.
- G. When any room in Project is used as a shop or storeroom, the Contractor shall be responsible for any repairs, patching, or cleaning necessary due to that use. Location of storage space shall be subject to prior written approval by District.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Manufacturers listed in various sections of Contract Documents are names of those manufacturers that are believed to be capable of supplying one or more of items specified therein.
- B. The listing of a manufacturer does not imply that every product of that manufacturer is acceptable as meeting the requirements of the Contract Documents.

2.02 FACILITIES AND EQUIPMENT

Contractor shall provide, install, maintain, and operate a complete and adequate facility for handling, the execution, disposal, and distribution of material and equipment as required for proper and timely performance of Work connected with Contract.

2.03 MATERIAL REFERENCE STANDARDS

Where material is specified solely by reference to "standard specifications" and if requested by District, Contractor shall submit for review data on actual material proposed to be incorporated into Work of Contract listing name and address of vendor, manufacturer, or producer, and trade or brand names of those materials, and data substantiating compliance with standard specifications.

PART 3 - EXECUTION

3.01 WORKMANSHIP

- A. Where not more specifically described in any other Contract Documents, workmanship shall conform to methods and operations of best standards and accepted practices of trade or trades involved and shall include items of fabrication, construction, or installation regularly furnished or required for completion (including finish and for successful operation, as intended).
- B. Work shall be executed by tradespersons skilled in their respective lines of Work. When completed, parts shall have been durably and substantially built and present a neat appearance.

3.02 COORDINATION

- A. Contractor shall coordinate installation of Work so as to not interfere with installation of others. Adjustment or rework because of Contractor's failure to coordinate will be at no additional cost to District.
- B. Contractor shall examine in-place work for readiness, completeness, fitness to be concealed or to receive other work, and in compliance with Contract Documents. Concealing or covering Work constitutes acceptance of additional cost which will result should in-place Work be found unsuitable for receiving other Work or otherwise deviating from the requirements of the Contract Documents.

3.03 COMPLETENESS

Contractor shall provide all portions of the Work, unless clearly stated otherwise, installed complete and operational with all elements, accessories, anchorages, utility connections, etc., in manner to assure well-balanced performance, in accordance with manufacturer's recommendations and by Contract Documents. Terms such as "installed complete," "operable condition," "for use intended," "connected to all utilities," "terminate with proper cap," "adequately anchored," "patch and refinish," "to match similar," should be assumed to apply in all cases, except where completeness of functional or operable condition is specifically stated as not required.

3.04 APPROVED INSTALLER OR APPLICATOR

Installation by a manufacturer's approved installer or applicator is an understood part of Specifications and only approved installer or applicator is to provide on-site Work where specified manufacturer has on-going program of approving (i.e. certifying, bonding, re-warranting) installers or applicators. Newly established relationships between a manufacturer and an installer or applicator who does not have other approved applicator work in progress or completed is not approved for this Project.

3.05 MANUFACTURER'S RECOMMENDATIONS

All installations shall be in accordance with manufacturer's published recommendations and specific written directions of manufacturer's representative.

Should Contract Documents differ from recommendations of manufacturer or directions of his representative, Contractor shall analyze differences, make recommendations to the District and the Architect in writing, and shall not proceed until interpretation or clarification has been issued by the District and/or the Architect.

END OF DOCUMENT

QUALITY CONTROL

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Inspector, Inspections and Tests, Uncovering of Work and Non-conforming of Work and Correction of Work;
- B. Special Conditions.

1.02 RELATED CODES:

- A. The Work is governed by requirements of Title 24, California Code of Regulations ("CCR"), and the Contractor shall keep a copy of these available at the job Site for ready reference during construction.
- B. The Division of the State Architect ("DSA") shall be notified at or before the start of construction.

1.03 OBSERVATION AND SUPERVISION:

- A. The District and Architect or their appointed representatives will review the Work and the Contractor shall provide facilities and access to the Work at all times as required to facilitate this review. Administration by the Architect and any consulting Structural Engineer will be in accordance with applicable regulations, including, without limitation, CCR, Part 1, Title 24, Section 4-341.
- B. One or more Project Inspector(s) approved by DSA and employed by or in contract with the District, referred to hereinafter as the "Project Inspector", will observe the work in accordance with CCR, Part 1, Title 24, Sections 4-333(b) and 4-342:
 - (1) The Project Inspector and Special Inspector(s) shall have access to the Work wherever it is in preparation or progress for ascertaining that the Work is in accordance with the Contract Documents and all applicable code sections. The Contractor shall provide facilities and operation of equipment as needed, and access as required and shall provide assistance for sampling or measuring materials.
 - (2) The Project Inspector will notify the District and Architect and call the attention of the Contractor to any observed failure of Work or material to conform to Contract Documents.

The Contractor shall conform with all applicable laws as indicated in the Contract Documents, including, without limitation, to CCR, Part 1, Title 24, Section 4-343.

The Contractor shall supervise and direct the Work and maintain a competent superintendent on the job who is authorized to act in all matters pertaining to the Work. The Contractor's superintendent shall also inspect all materials, as they arrive, for compliance with the Contract Documents. Contractor shall reject defective Work or materials immediately upon delivery or failure of the Work or material to comply with the Contract Documents. The Contractor shall submit verified reports as indicated in the Contract Documents, including, without limitation, the Specifications and as required by Part 1, Title 24, Section 4-336.

1.04 TESTING AGENCIES:

- A. Testing agencies and tests shall be in conformance with the General Documents and the requirements of Part 1, Title 24, Section 4- 335.
- B. Testing and inspection in connection with earthwork shall be under the direction of the District's consulting soils engineer, if any, referred to hereinafter as the "Soils Engineer."
- C. Testing and inspection of construction materials and workmanship shall be performed by a qualified laboratory, referred to hereinafter as the "Testing Laboratory." The Testing Laboratory shall be under direction of an engineer registered in the State of California, shall conform to requirements of ASTM E329, and shall be employed by or in contract with the District.
- D. Testing laboratory shall be approved by the Architect and the Division of the State Architect.
- E. Owner will employ and pay for services of an independent testing labatory to perform specified inspection and testing. Retesting cost for failed test will be Contractors responsibilityand will be back-charged against the contract.

1.05 TESTS AND INSPECTIONS:

- A. The Contractor shall be responsible for notifying the District and Project Inspector of all required tests and inspections. Contractor shall notify the District and Project Inspector at least seventy-two hours (72) hours in advance of performing any Work requiring testing or inspection.
- B. The Contractor shall provide access to Work to be tested and furnish incidental labor, equipment, and facilities to facilitate all inspections and tests.
- C. The District will pay for first inspections and tests required by the "CCR", and other inspections or tests that the District and/or the Architect may direct to have made, including the following principal items:
 - (1) Tests and observations for earthwork and paving.
 - (2) Tests for concrete mix designs, including tests of trial batches.
 - (3) Tests and inspections for structural steel work.
 - (4) Field tests for framing lumber moisture content.

- (5) Additional tests directed by the District that establish that materials and installation comply with the Contract Documents.
 - (6) Tests and observations of welding and expansion anchors.
- D. The District may at its discretion, pay and then back charge the Contractor for:
 - (1) Retests or reinspections, if required, and tests or inspections required due to Contractor error or lack of required identifications of material.
 - (2) Uncovering of work in accordance with Contract Documents.
 - (3) Testing done on weekends, holidays, and overtime will be chargeable to the Contractor for the overtime portion.
 - (4) Testing done off Site.
- E. Testing and inspection reports and certifications:
 - (1) If initially received by Contractor, Contractor shall provide to each of the following a copy of the agency or laboratory report of each test or inspection or certification.
 - (a) The District;
 - (b) The Construction Manager, if any;
 - (c) The Architect;
 - (d) The Consulting Engineer, if any;
 - (e) Other engineers on the Project, as appropriate;
 - (f) The Project Inspector; and
 - (g) The Contractor.
 - (2) When the test or inspection is one required by the CCR, a copy of the report shall also be provided to the DSA.

1.06 LABORATORY REPORTS

- A. After each inspection and test, promptly submit two copies of laboratory report to Owner, Architect, Contractor and DSA.
- B. Include:
 - (1) Date of issue,
 - (2) DSA Application and File numbers,
 - (3) Project title and number,

- (4) Name of inspector,
 - (5) Date and time of sampling or inspection,
 - (6) Identification of product and Specification Section,
 - (7) Location in the Project,
 - (8) Type of inspection or test,
 - (9) Date of test,
 - (10) Results of test,
 - (11) Conformance with Contract Documents.
- C. When requested by Architect, provide interpretation of test results.

1.07 LIMITS ON TESTING LABORATORY AUTHORITY

- A. Laboratory may not release, revoke, alter or enlarge on requirements of Contract Documents.
- B. Laboratory may not approve or accept any portion of the work.
- C. Laboratory may not assume any duties of Contractor.
- D. Laboratory has no authority to stop the work.

PART 2 - PRODUCTS

2.01 TYPE OF TEST AND INSPECTIONS

- A. Testing and inspection shall be in accordance with DSA Form 103 (or current version)
- B. Slump Test
ASTM C 143
- C. Concrete Tests

Testing agency shall test concrete used in the work per the following paragraphs:

- (1) Compressive Strength:
 - (a) Minimum number of tests required: One (1) set of three (3) cylinders for each 100 cubic yards (Sec. 2604(h) 01) of concrete or major fraction thereof, placed in one (1) day. See Title 24, Section 2605(g).

- (b) Two cylinders of each set shall be tested at twenty-eight (28) days. One (1) cylinder shall be held in reserve and tested only when directed by the Architect or District.
- (c) Concrete shall test the minimum ultimate compressive strength in twenty-eight 28 days, as specified on the structural drawings.
- (d) In the event that the twenty-eight (28) day test falls below the minimum specified strength, the effective concrete in place shall be tested by taking cores in accordance with UBC Standard No. 26-13 and tested as required for cylinders.
- (e) In the event that the test on core specimens falls below the minimum specified strength, the concrete will be deemed defective and shall be removed and replaced upon such direction of the Architect, and in a manner acceptable to the Division of the State Architect.

D. Reinforcing, Steel

PART 3 - EXECUTION Not Used.

END OF DOCUMENT

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Requirements for Testing Laboratory.
 - 2. Contractor's responsibilities for facilitation of Testing and Inspections.

1.2 RELATED SECTIONS AND DOCUMENTS

- A. Geologic Hazards & Soils Report.
- B. DSA 103 - Structural Test & Inspections List.
- C. Section 31 0000, Earthwork.
- D. Individual Specification Sections: Inspections and tests required, and standards for testing.

1.3 REFERENCES

- A. California Administrative Code (CAC), edition as noted on the drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Building Code (CBC), edition as noted on the drawings, as adopted by the California Division of the State Architect (DSA).

1.4 SELECTION AND PAYMENT

- A. Testing laboratory shall be approved by both the Architect and the Division of the State Architect.
- B. Owner will employ and pay for services of an independent testing laboratory to perform specified inspection and testing. Retesting costs for failed tests will be the Contractors responsibility and will be back-charged against the contract.
- C. Under provisions for Relocatable Building construction, Owner limits his exposure to in-plant inspection and testing costs. Refer to other Specification Sections related to such specific construction.
- D. Employment of testing laboratory shall in no way relieve Contractor of obligation to perform work in accordance with requirements of Contract Documents.

1.5 LABORATORY REPORTS

- A. After each inspection and test, promptly submit two copies of laboratory report to Owner, Architect, Contractor and DSA.
- B. Include:

TESTING AND INSPECTION SERVICES

SECTION 01 4523

3595001

1. Date of issue,
2. DSA Application and File numbers,
3. Project title and number,
4. Name of inspector,
5. Date and time of sampling or inspection,
6. Identification of product and Specification Section,
7. Location in the Project,
8. Type of inspection or test,
9. Date of test,
10. Results of test,
11. Conformance with Contract Documents.

C. When requested by Architect, provide interpretation of test results.

1.6 LIMITS ON TESTING LABORATORY AUTHORITY

- A. Laboratory may not release, revoke, alter or enlarge on requirements of Contract Documents.
- B. Laboratory may not approve or accept any portion of the work.
- C. Laboratory may not assume any duties of Contractor.
- D. Laboratory has no authority to stop the work.

1.7 CONTRACTOR RESPONSIBILITIES

- A. Deliver to laboratory at designated location, adequate samples of materials proposed to be used which require testing, along with proposed mix designs. Allow reasonable time for review and testing.
- B. Arrange for, and coordinate with, laboratory for all required testing and inspection. Provide adequate notice, in advance, for proper scheduling and processing of testing. The Inspector will not be responsible for scheduling or arranging for testing and inspection services.
- C. Cooperate with laboratory personnel, and provide access to the work and to manufacturer's facilities.
- D. Provide incidental labor and facilities to provide access to work to be tested, to obtain and handle samples at the site or at the source of products to be tested, to facilitate tests and inspections, storage and curing of test samples.
- E. Notify Architect, Inspector, Structural Engineer (when applicable) and laboratory 24 hours prior to expected time for operations requiring inspection and testing services.

END OF SECTION

TEMPORARY FACILITIES AND CONTROLS

PART 1 – GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions;
- B. Special Conditions;
- C. Site Standards; and
- D. Construction Waste Management and Disposal.

1.02 TEMPORARY UTILITIES:

A. Electric Power and Lighting:

- (1) Contractor will pay for power during the course of the Work. To the extent power is available in the building(s) or on the Site, Contractor may use the District's existing utilities by making prearranged payments to the District for the utilities used by Contractor and all Subcontractors. Contractor shall be responsible for providing temporary facilities required to deliver that power service from its existing location in the building(s) or on the Site to point of intended use.
- (2) Contractor shall verify characteristics of power available in building(s) or on the Site. Contractor shall take all actions required to make modifications where power of higher voltage or different phases of current are required. Contractor shall be fully responsible for providing that service and shall pay all costs required therefor.
- (3) Contractor shall furnish, wire for, install, and maintain temporary electrical lights wherever it is necessary to provide illumination for the proper performance and/or observation of the Work: a minimum of 20 foot-candles for rough work and 50 foot-candles for finish work.
- (4) Contractor shall be responsible for maintaining existing lighting levels in the project vicinity should temporary outages or service interruptions occur.

B. Water:

- (1) Contractor shall pay for water used during the course of the Work. Contractor shall coordinate and pay for installation or use of water meter in compliance with local water agency requirements. To the

extent water is then available in the building(s) or on the Site, Contractor may use the District's existing utilities by making prearranged payments to the District for the utilities used by Contractor and all Subcontractors. Contractor shall be responsible for providing temporary facilities required to deliver such utility service from its existing location in the building(s), on the Site, or other location approved by the local water agency, to point of intended use.

- (2) Contractor shall use backflow preventers on water lines at point of connection to District's water supply. Backflow preventers shall comply with requirements of Uniform Plumbing Code.
- (3) Contractor shall make potable water available for human consumption.

C. Sanitary Facilities:

- (1) Contractor shall provide sanitary temporary facilities in no fewer numbers than required by law and such additional facilities as may be directed by the Inspector for the use of all workers. The facilities shall be maintained in a sanitary condition at all times and shall be left at the Site until removal is directed by the Inspector or Contractor completes all other work at the Site.
- (2) Use of toilet facilities in the Work under construction shall not be permitted except by consent of the Inspector and the District.

D. Fire Protection:

- (1) Contractor shall provide and maintain fire extinguishers and other equipment for fire protection. Such equipment shall be designated for use for fire protection only and shall comply with all requirements of the California Fire, State Fire Marshall and/or its designee.
- (2) Where on-site welding and burning of steel is unavoidable, Contractor shall provide protection for adjacent surfaces.

E. Trash Removal:

- (1) Contractor shall provide trash removal on a timely basis. Under no circumstance shall Contractor use District trash service.

F. Field Office:

- (1) If Contractor chooses to provide a field office, it shall be an acceptable construction trailer that is well-lit and ventilated. The construction trailer shall be equipped with shelves, desks, filing cabinet, chairs, and such other items of equipment needed. Trailer and equipment are the property of the Contractor and must be removed from the Site upon completion of the Work.
- (2) Contractor shall provide any additional electric lighting and power required for the trailer. Contractor shall make adequate provisions for heating and cooling as required.

1.03 CONSTRUCTION AIDS:

- A. Plant and Equipment:
 - (1) Contractor shall furnish, operate, and maintain a complete plant for fabricating, handling, conveying, installing, and erecting materials and equipment; and for conveyances for transporting workers. Include elevators, hoists, debris chutes, and other equipment, tools, and appliances necessary for performance of the Work.
 - (2) Contractor shall maintain plant and equipment in safe and efficient operating condition. Damages due to defective plant and equipment, and uses made thereof, shall be repaired by Contractor at no expense to the District.
- B. None of the District's tools and equipment shall be used by Contractor for the performance of the Work.

1.04 BARRIERS AND ENCLOSURES:

- A. Contractor shall obtain the District's written permission for locations and types of temporary barriers and enclosures, including fire-rated materials proposed for use, prior to their installation.
- B. Contractor shall provide and maintain temporary enclosures to prevent public entry and to protect persons using other buildings and portions of the Site and/or Premises, the public, and workers. Contractor shall also protect the Work and existing facilities from the elements, and adjacent construction and improvements, persons, and trees and plants from damage and injury from demolition and construction operations.
- C. Contractor shall provide site access to existing facilities for persons using other buildings and portions of the Site, the public, and for deliveries and other services and activities.
- D. Tree and Plant Protection:
 - (1) Contractor shall preserve and protect existing trees and plants on the Premises that are not designated or required to be removed, and those adjacent to the Premises.
 - (2) Contractor shall provide barriers to a minimum height of 4'-0" around drip line of each tree and plant, around each group of trees and plants, as applicable, in the proximity of demolition and construction operations, or as denoted on the Plans.
 - (3) Contractor shall not park trucks, store materials, perform Work or cross over landscaped areas. Contractor shall not dispose of paint thinners, water from cleaning, plastering or concrete operations, or other deleterious materials in landscaped areas, storm drain systems, or sewers. Plant materials damaged as a result of the performance of the Work shall, at the option of the District and at Contractor's expense, either be replaced with new plant materials equal in size to

those damaged or by payment of an amount representing the value of the damaged materials as determined by the District.

- (4) Contractor shall remove soil that has been contaminated during the performance of the Work by oil, solvents, and other materials which could be harmful to trees and plants, and replace with good soil, at Contractor's expense.
- (5) Excavation around Trees:
 - (a) Excavation within drip lines of trees shall be done only where absolutely necessary and with written permission from the District.
 - (b) Where trenching for utilities is required within drip lines, tunneling under and around roots shall be by hand digging and shall be approved by the District. Main lateral roots and taproots shall not be cut. All roots 2 inches in diameter and larger shall be tunneled under and heavily wrapped with wet burlap so as to prevent scarring or excessive drying. Smaller roots that interfere with installation of new work may be cut with prior approval by the District. Roots must first be cut with a Vermeer, or equivalent, root cutter prior to any trenching.
 - (c) Where excavation for new construction is required within drip line of trees, hand excavation shall be employed to minimize damage to root system. Roots shall be relocated in backfill areas wherever possible. If encountered immediately adjacent to location of new construction, roots shall be cut approximately 6 inches back from new construction.
 - (d) Approved excavations shall be carefully backfilled with the excavated materials approved for backfilling. Backfill shall conform to adjacent grades without dips, sunken areas, humps, or other surface irregularities. Do not use mechanical equipment to compact backfill. Tamp carefully using hand tools, refilling and tamping until Final Acceptance as necessary to offset settlement.
 - (e) Exposed roots shall not be allowed to dry out before permanent backfill is placed. Temporary earth cover shall be provided, or roots shall be wrapped with four layers of wet, untreated burlap and temporarily supported and protected from damage until permanently relocated and covered with backfill.
 - (f) Accidentally broken roots should be sawed cleanly 3 inches behind ragged end.

1.05 SECURITY:

The Contractor shall be responsible for project security for materials, tools, equipment, supplies, and completed and partially completed Work.

1.06 TEMPORARY CONTROLS:

A. Noise Control:

- (1) Contractor acknowledges that adjacent facilities may remain in operation during all or a portion of the Work period, and it shall take all reasonable precautions to minimize noise as required by applicable laws and the Contract Documents.
- (2) Notice of proposed noisy operations, including without limitation, operation of pneumatic demolition tools, concrete saws, and other equipment, shall be submitted to the District a minimum of forty-eight (48) hours in advance of their performance.

B. Noise and Vibration:

- (1) Equipment and impact tools shall have intake and exhaust mufflers.
- (2) Contractor shall cooperate with District to minimize and/or cease the use of noisy and vibratory equipment if that equipment becomes objectionable by its longevity.

C. Dust and Dirt:

- (1) Contractor shall conduct demolition and construction operations to minimize the generation of dust and dirt, and prevent dust and dirt from interfering with the progress of the Work and from accumulating in the Work and adjacent areas including, without limitation, occupied facilities.
- (2) Contractor shall periodically water exterior demolition and construction areas to minimize the generation of dust and dirt.
- (3) Contractor shall ensure that all hauling equipment and trucks carrying loads of soil and debris shall have their loads sprayed with water or covered with tarpaulins, and as otherwise required by local and state ordinance.
- (4) Contractor shall prevent dust and dirt from accumulating on walks, roadways, parking areas, and planting, and from washing into sewer and storm drain lines.

D. Water:

- (1) Contractor shall not permit surface and subsurface water, and other liquids, to accumulate in or about the vicinity of the Premises. Should accumulation develop, Contractor shall control the water or other liquid, and suitably dispose of it by means of temporary pumps, piping, drainage lines, troughs, ditches, dams, or other methods.

E. Pollution:

- (1) No burning of refuse, debris, or other materials shall be permitted on or in the vicinity of the Premises.
- (2) Contractor shall comply with applicable regulatory requirements and anti-pollution ordinances during the conduct of the Work including, without limitation, demolition, construction, and disposal operations.

F. Lighting:

- (1) If portable lights are used after dark, all light must be located so as not to direct light into neighboring property.

1.07 PUBLICITY RELEASES:

- A. Contractor shall not release any information, story, photograph, plan, or drawing relating information about the Project to anyone, including press and other public communications medium, including, without limitation, on website(s) without the written permission of the District.

PART 2 – PRODUCTS Not used.

PART 3 – EXECUTION Not used.

END OF DOCUMENT

CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions;
- B. Special Conditions; and
- C. Temporary Facilities and Controls.

1.02 SECTION INCLUDES:

- A. Administrative and procedural requirements for the following:
 - (1) Salvaging non-hazardous construction waste.
 - (2) Recycling non-hazardous construction waste.
 - (3) Disposing of non-hazardous construction waste.

1.03 DEFINITIONS:

- A. Construction Waste: Building and site improvement materials and other solid waste resulting from construction, remodeling, renovation, or repair operations. Construction waste includes packaging.
- B. Demolition Waste: Building and site improvement materials resulting from demolition or selective demolition operations.
- C. Disposal: Removal off-site of demolition and construction waste and subsequent sale, recycling, reuse, or deposit in landfill or incinerator acceptable to authorities having jurisdiction.
- D. Recycle: Recovery of demolition or construction waste for subsequent processing in preparation for reuse.
- E. Salvage: Recovery of demolition or construction waste and subsequent sale or reuse in another facility.
- F. Salvage and Reuse: Recovery of demolition or construction waste and subsequent incorporation into the Work.

1.04 PERFORMANCE REQUIREMENTS:

- A. General: Develop waste management plan that results in end-of Project rates for salvage/recycling of sixty-five percent (65%) by weight (or by volume, but not a combination) of total waste generated by the Work.

1.05 SUBMITTALS:

- A. Waste Management Plan: Submit waste management plan within 30 days of date established for commencement of the Work.
- B. Waste Reduction Progress Reports: Concurrent with each Application for Payment, submit copies of report. Include the following information:
 - (1) Material category.
 - (2) Generation point of waste.
 - (3) Total quantity of waste in tons or cubic yards.
 - (4) Quantity of waste salvaged, both estimated and actual in tons or cubic yards.
 - (5) Quantity of waste recycled, both estimated and actual in tons or cubic yards.
 - (6) Total quantity of waste recovered (salvaged plus recycled) in tons or cubic yards.
 - (7) Total quantity of waste recovered (salvaged plus recycled) as a percentage of total waste.
- C. Waste Reduction Calculations: Before request for final payment, submit copies of calculated end-of-Project rates for salvage, recycling, and disposal as a percentage of total waste generated by the Work.
- D. Records of Donations: Indicate receipt and acceptance of salvageable waste donated to individuals and organizations. Indicate whether organization is tax exempt.
- E. Records of Sales: Indicate receipt and acceptance of salvageable waste sold to individuals and organizations. Indicate whether organization is tax exempt.
- F. Recycling and Processing Facility Records: Indicate receipt and acceptance of recyclable waste by recycling and processing facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.
- G. Landfill and Incinerator Disposal Records: Indicate receipt and acceptance of waste by landfills and incinerator facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.

- H. Qualification Data: For Waste Management Coordinator.
- I. Submittal procedures and quantities are specified in Document 01 33 00.

1.06 QUALITY ASSURANCE:

- A. Waste Management Coordinator Qualifications: LEED Accredited Professional by U.S. Green Building Council.
- B. Regulatory Requirements: Comply with hauling and disposal regulations of authorities having jurisdiction.
- C. Waste Management Conference: Conduct conference at Project site to comply with requirements. Review methods and procedures related to waste management including, but not limited to, the following:
 - (1) Review and discuss waste management plan including responsibilities of Waste Management Coordinator.
 - (2) Review requirements for documenting quantities of each type of waste and its disposition.
 - (3) Review and finalize procedures for materials separation and verify availability of containers and bins needed to avoid delays.
 - (4) Review procedures for periodic waste collection and transportation to recycling and disposal facilities.
 - (5) Review waste management requirements for each trade.

1.07 WASTE MANAGEMENT PLAN:

- A. General: Develop plan consisting of waste identification, waste reduction work plan, and cost/revenue analysis. Indicate quantities by weight or volume, but use same units of measurement throughout waste management plan.
- B. Waste Identification: Indicate anticipated types and quantities of site-clearing and construction waste generated by the Work. Include estimated quantities and assumptions for estimates.
- C. Waste Reduction Work Plan: List each type of waste and whether it will be salvaged, recycled, or disposed of in landfill or incinerator. Include points of waste generation, total quantity of each type of waste, quantity for each means of recovery, and handling and transportation procedures.
 - (1) Salvaged Materials for Reuse: For materials that will be salvaged and reused in this Project, describe methods for preparing salvaged materials before incorporation into the Work.

- (2) Salvaged Materials for Sale: For materials that will be sold to individuals and organizations, include list of their names, addresses, and telephone numbers.
- (3) Salvaged Materials for Donation: For materials that will be donated to individuals and organizations, include list of their names, addresses, and telephone numbers.
- (4) Recycled Materials: Include list of local receivers and processors and type of recycled materials each will accept. Include names, addresses, and telephone numbers.
- (5) Disposed Materials: Indicate how and where materials will be disposed of. Include name, address, and telephone number of each landfill and incinerator facility.
- (6) Handling and Transportation Procedures: Include method that will be used for separating recyclable waste including sizes of containers, container labeling, and designated location on Project site where materials separation will be located.

PART 2 - PRODUCTS Not Used.

PART 3 - EXECUTION

3.01 PLAN IMPLEMENTATION:

- A. General: Implement approved waste management plan. Provide handling, containers, storage, signage, transportation, and other items as required to implement waste management plan during the entire duration of the Contract.
 - (1) Comply with Document 01 50 00 for operation, termination, and removal requirements.
- B. Training: Train workers, subcontractors, and suppliers on proper waste management procedures, as appropriate for the Work occurring at Project site.
 - (1) Distribute waste management plan to everyone concerned within 3 days of submittal return.
 - (2) Distribute waste management plan to entities when they first begin work on site. Review plan procedures and locations established for salvage, recycling, and disposal.
- C. Site Access and Temporary Controls: Conduct waste management operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.

- (1) Designate and label specific areas of Project site necessary for separating materials that are to be salvaged, recycled, reused, donated, and sold.
- (2) Comply with Document 01 50 00 for controlling dust and dirt, environmental protection, and noise control.

3.02 RECYCLING CONSTRUCTION WASTE:

- A. General: Recycle paper and beverage containers used by on-site workers.
- B. Recycling Incentives: Revenues, savings, rebates, tax credits, and other incentives received for recycling waste materials shall accrue to the Contractor.
- C. Procedures: Separate recyclable waste from other waste materials, trash, and debris. Separate recyclable waste by type at Project site to the maximum extent practical.
 - (1) Provide appropriately marked containers or bins for controlling recyclable waste until they are removed from Project Site. Include list of acceptable and unacceptable materials at each container and bin.
 - (a) Inspect containers and bins for contamination and remove contaminated materials if found.
 - (2) Stockpile processed materials on site without intermixing with other materials. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
 - (3) Stockpile materials away from construction area. Do not store within drip line of remaining trees.
 - (4) Store components off the ground and protect from the weather.
 - (5) Remove recyclable waste off District property and transport to recycling receiver or processor.
- D. Packaging:
 - (1) Cardboard and Boxes: Break down packaging into flat sheets. Bundle and store in a dry location.
 - (2) Polystyrene Packaging: Separate and bag material.
 - (3) Pallets: As much as possible, require deliveries using pallets to remove pallets from Project Site. For pallets that remain on Site, break down pallets into component wood pieces and comply with requirements for recycling wood.
 - (4) Crates: Break down crates into component wood pieces and comply with requirements for recycling wood.

- E. Site-Clearing Wastes: Chip brush, branches, and trees on site.
- F. Wood Materials:
 - (1) Clean Cut-Offs of Lumber: Grind or chip into small pieces.
 - (2) Clean Sawdust: Bag sawdust that does not contain painted or treated wood.

3.03 DISPOSAL OF WASTE:

- A. General: Except for items or materials to be salvaged, recycled, or otherwise reused, remove waste materials from Project Site and legally dispose of them in a landfill or incinerator acceptable to authorities having jurisdiction.
 - (1) Except as otherwise specified, do not allow waste materials that are to be disposed of accumulate on site.
 - (2) Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
- B. Burning: Do not burn waste materials.
- C. Disposal: Transport waste materials off District property and legally dispose of them.

END OF DOCUMENT

FIELD OFFICES

PART 1 – GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions;
- B. Special Conditions; and
- C. Temporary Facilities and Controls.

1.02 SECTION INCLUDES:

- A. Requirements for Field Offices and Field Office Trailers.

1.03 SUMMARY:

- A. General: Contractor shall provide District's Field Office Trailer and contents, for District's use exclusively, during the term of the Contract.
- B. Property: Trailer, furniture, furnishings, equipment, and the like, supplied by the Contractor with the Office Trailer shall remain the property of the Contractor; District property items installed, delivered, and the like by District within the Office Trailer will remain District's property.
- C. Modifications: District reserves the right to modify the trailer or contents, or both, as may be deemed proper by District.
- D. Condition: Trailer and contents shall be clean, neat, substantially finished, in good, proper, and safe condition for use, operation, and the like; the trailer and contents shall not be required to be new.
- E. Installation Timing: Provide safe, fully furnished, functional, proper, complete, and finished trailer properly ready for entire use, within fourteen (14) calendar days of District's notification of the issuance of Notice to Proceed.

1.04 SUBMITTALS:

- A. General: Submit submittals to District in quantity, format, type, and the like, as specified herein.
- B. Office Trailer Data: One (1) copy of manufacturer's descriptive data, technical descriptions, regulatory compliance, industry standards, installation, removal, and maintenance instructions.

- C. Equipment Data: Two (2) copies of manufacturer data for each type of equipment, if directed by District.
- D. Furniture and Furnishings Data: Two (2) copies of manufacturer data for each type of equipment, if directed by District.
- E. Plans: One (1) reproducible copy of appropriately scaled plans of trailer layout. Plans shall include, but not be limited to: lighting; furniture; equipment; telephone and electrical outlets; and the like.
- F. Product Samples: One (1) complete and entire unit of each type, if directed by District.

1.05 QUALITY ASSURANCE

- A. Standards: In the event that provisions of codes, regulations, safety orders, Contract Documents, referenced manufacturer's specifications, manufacturer's instructions, industry standards, and the like, are in conflict, the more restrictive and higher quality shall govern.
- B. Installer: Installer or Installers engaged by Contractor must have a minimum of five (5) years of documented and properly authenticated successful experience of specialization in the installation of the items or systems, or both, specified herein.
- C. Manufacturer: Contractor shall obtain products from nationally and industry recognized Manufacturer with five (5) years minimum, of immediately recent, continuous, documented and properly authenticated successful experience of specialization in the manufacture of the product specified herein.
- D. State Personnel Training: Provide proper training for maintenance and operations, including emergency procedures, and the like, as directed by District.
- E. Units: Shall be sound and free of defects, and shall not include any damage or defect that will impair the safety, installation, performance, or the durability of the entire Office Trailer and appurtenant systems.

1.06 REGULATORY REQUIREMENTS

- A. General: Work shall be executed in accordance with applicable Codes, Regulations, Statutes, Enactments, Rulings, Laws, each authority having jurisdiction, and including, but not limited to, Regulatory Requirements specified herein.
- B. California Building Standards Code ("CBSC").
- C. California Code of Regulations, Title 25, Chapter 3, Sub Chapter 2, Article 3 ("CCR").
- D. Coach Insignia: Trailer shall display California Commercial Coach Insignia; such insignia shall be deemed to show that the trailer is in accordance with the Construction and Fire Safety requirements of CCR.

PART 2 – PRODUCTS

2.01 FIELD OFFICE TRAILER

- A. General: Provide entire Field Office Trailer of type, function, operation, capacity, size, complete with controls, safety devices, accessories, and the like, for proper and durable installation. Partitions, walls, ceiling, and other interior and exterior surfaces shall be appropriately finished, including, but not limited to, trim, painting, wall base, floor covering, suspended or similar ceiling, and the like; provide systems, components, units, nuts, bolts, screws, anchoring devices, fastening devices, washers, accessories, adhesives, sealants, and other items of type, grade, and class required for the particular use, not identified but required for a complete, weather-tight, appropriately operating, and finished installation.
- B. Manufacturers: General Electric Capital Modular Space; The Space Place, Inc.; or equal.
- C. Program: Provide a wheel-mounted trailer with stairs, landings, platforms, ramps, and the like, in good, proper, safe, clean, and properly finished condition; with proper heavy duty locks, and other proper and effective security at all doors, windows, and the like. Trailer shall be maintained in good, proper, safe, clean, and properly finished condition during the Contract.
 - (1) Nominal Trailer Size: Four hundred eighty (480) square feet, minimum.
 - (2) Stairs, Platform: Properly finished stairs, platforms, and ramps.
 - (3) Doors: Two (2), three (3) foot wide exterior doors with locksets; finished ramp, steps, and entry platform at each exterior door.
 - (4) Keys: Submit five (5) keys for each door, window, furniture unit, and the like. There shall be no other key copies or originals available; each key shall be identified for District; and shall be labeled, or tagged
 - (5) Lighting: Sixty-five (65) foot-candles illumination minimum at any point, at thirty (30) inches above finished floor throughout from fluorescent light source, exclusively, or as directed by District.
 - (6) Electrical Outlets: One (1) duplex outlet evenly spaced every twelve (12) linear horizontal feet of wall face, and electrical service ready for use.

2.02 FIELD OFFICE TRAILER ITEMS

- A. General: Provide the Field Office Trailer with the following arranged into two (2) workstations:
 - (1) Desks: Two (2) desks: thirty-six (36) inches by sixty (60) inches; steel, laminated plastic top; locking, one (1) or two (2) file drawers single pedestal; steel; provide five (5) keys to District.

- (2) Tables: Two (2) tables; thirty-six (36) inches by sixty (60) inches; twenty-nine (29) inches high; steel, laminated plastic top tables; one (1) at each desk.
 - (3) Chairs: Two (2) chairs: swivel; steel; with seat cushion and arms; one (1) at each desk.
 - (4) Waste Baskets: Two (2) waste baskets, one at each desk.
- B. Furniture and Equipment: Provide in the space located to effect efficient and logical use.
- (1) File cabinet: One (1); four (4) drawer; lateral; steel locking.
 - (2) Plan Table: One (1) plan table: thirty-six (36) inches deep by seventy-two (72) inches wide by forty-two (42) inches high; adjustable; wood or steel; with lockable plan and pencil drawers.
 - (3) Drafting Stool: One (1) drafting stool; swiveling; steel; padded; adjustable; with footrest and casters.
 - (4) Bookshelf: One (1) bookshelf: thirty-six (36) inches deep by seventy-two (72) inches wide by forty-two (42) inches high; adjustable; wood or steel; with lockable plan and pencil drawer.
 - (5) Plan Rack: One (1) wheel mounted plan rack.
 - (6) Waste Baskets: One (1) large waste basket.
 - (7) Coat/Hat Hanger: Wall mounted with minimum capacity for four (4) garments and ten (10) hats.
 - (8) Document Management System: Shall include an integrated high-volume printer, copier, and facsimile machine, including stand, base, and storage cabinet; and shall include the following features:
 - (a) Type: Laser, dry electrostatic transfer, plain paper, digital, multi-function imaging system.
 - (b) Network: Ethernet or Token Ring network ready, Plug-and-Play.
 - (c) Print, send/receive facsimile from any connected workstation.
 - (d) Resolution: Six hundred (600) dots per inch by six hundred (600) dots per inch, minimum.
 - (e) Print Speed: Twenty (20) pages per minute, minimum.
 - (f) Copies: Twenty (20) copies per minute, minimum.
 - (g) Document Handler: Forty (40) sheet, minimum

- (h) Collator: Forty (40) bin, minimum, with stapling.
- (i) Duplexing: Capable.
- (j) Paper Size: Capable of handling paper sizes to eleven (11) inches by seventeen (17) inches.
- (k) Paper Cassettes: One (1) each for eight and one half (8.5) inches by eleven (11) inches, eight and one half (8.5) inches by fourteen (14) inches, and eleven (11) inches by seventeen (17) inches paper sizes; minimum two hundred fifty (250) sheets per cassette.
- (l) Reduction/Enlargement: Capable of reduction to twenty-five percent (25%) and enlargement to two hundred percent (200%).
- (m) Facsimile Electronic Storage: Capable of storing minimum of fifty (50) speed dial numbers, group faxing and broadcast faxing.
- (n) Facsimile Scanning: Capable of scanning into memory a minimum of one hundred (100) pages with maximum scan time of three (3) seconds per page.
- (o) Halftone: Sixty-four (64) levels.
- (p) Redial: Automatic and Manual.
- (9) Maintenance: Contractor shall purchase service agreements for each unit of equipment for the duration of the project plus two (2) months, and shall maintain all equipment in proper working condition. Service agreements shall include provision for replacement of toner cartridges and other items required to effect proper unit use. Service agreements shall also provide for:
 - (a) Unlimited Service Calls.
 - (b) Same Day Response.
 - (c) All parts, labor, preventative maintenance and mileage.
 - (d) All chemicals, such as toner, fixing agent, and the like.
 - (e) System training and setup.
- (10) Portable Toilets: Two (2); each shall include a urinal; each unit shall be a properly enclosed chemical unit conforming to ANSI Z4.3.
 - (a) Location: As directed by District.
 - (b) Maintenance: Maintain each unit and surrounding areas in a clean, hygienic and orderly manner, at all time. Empty, clean,

and sanitize each unit each day at a location and time as directed by District.

- (c) Removal: Relocate, or remove from the site, each Portable Toilet. Upon such directive by District, the Contractor shall forthwith relocate or remove each Portable Toilet and submit the affected areas to a condition which existed prior to the installation of each Portable Toilet, within three (3) calendar days, or as directed by District in writing, at no cost to District.

2.03 UTILITY AND SERVICES

- A. Telephone Service: Contractor shall provide and interface the entire telephone service, and shall properly and timely pay for telephone service for District's non-long-distance use.
- B. Electrical Service: Provide all proper connections and continuously pay for service for the duration of the Work.

2.04 FINISHES

- A. General: Manufacturer standard finish system over surfaces properly cleaned, pretreated, and prepared to obtain proper bond; all visible surfaces shall be coated.
- B. Finish: Color as selected by District from manufacturer standard palette.

PART 3 – EXECUTION

3.01 INSTALLATION

- A. General: Properly prepare area and affected items to receive the Work. Set Work accurately in location, alignment, and elevation; rigidly, securely, and firmly anchor to appropriate structure; install plumb, straight, square, level, true, without racking, rigidly anchored to proper solid blocking, substrate, and the like; provide appropriate type and quantity of reinforcements, fasteners, adhesives, self-adhesive and other tapes; lubricants, coatings, accessories, and the like, as required for a complete, structurally rigid, stable, sound, and appropriately finished installation, in accordance with manufacturer's published instructions, and as indicated. The more restrictive and higher quality requirement shall govern. Moving parts shall be properly secured, without binding, looseness, noise, and the like.
- B. Installation: Install in accordance with 25 CCR 3.2.3 and as directed by District; jack up trailer and level both ways; mount on proper concrete piers with all load off wheels; provide required tie down and accessories per Section 4368 of referenced CCR, and as directed by District.
- C. Rejected Work: Work, materials, unit, items, systems, and the like, not accepted by District shall be deemed rejected, and shall forthwith be removed and replaced with proper and new Work, materials, unit, items, systems, and the like at no cost to District.

- D. Standard: Comply with manufacturer's published instructions, or with instructions as shown or indicated; the more restrictive and higher quality requirement shall govern.
- E. Location: As directed by District.
- F. Fire Resistance: Construct and install in accordance with UL requirements.
- G. Maintenance: Contractor shall maintain trailer and adjacent areas in a safe, clean and hygienic condition throughout the duration of the Work, and as directed by District. Properly repair or replace furniture or other items, as directed by District. Properly remove unsafe, damaged, or broken furniture, or similar items, and replace with safe and proper items. Contractor shall pay cost of all services, repair, and maintenance, or replacement of each item.
- H. Janitorial Service: Provide professional janitorial services, including, but not limited to, trash, waste paper baskets, fill paper dispensers; clean and dust all furniture, files, and the like; sweep and mop resilient and similar flooring; and vacuum carpeting and similar flooring.
 - (1) Frequency: Two (2) times per week, minimum.
- I. Removal: Properly remove the Office Trailer and contents from the Site upon completion of the Contract, or as directed by District in writing. Forthwith properly patch and repair affected areas; replace damaged items with new items. Carefully and properly inventory, clean, pack, store, and protect District property; submit District property to District at a date, time and location as directed by District.

END OF DOCUMENT

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: VOC restrictions for product categories listed below under Article "DEFINITIONS" and in compliance with the following.
 - 1. California Code of Regulations, Title 24, Part 11 California Green Building Standards Code.
 - 2. Local Agency.
 - 3. No Rating System is applicable.
- B. Products of each category that are installed in the project must comply; applicable laws and ordinances do not allow for partial compliance.
- C. Listing of a product in these Specifications shall not be construed as a solicitation or requirement to use any product or combination of products in violation of the requirements of South Coast Air Quality Management District Rule No.1168, as described in Rule 1168(g).
 - 1. If a listed product does not meet the requirements of this rule, request approval for use of an alternate product by the same or another manufacturer meeting the requirements of this rule.
 - 2. Do not use products which do not meet the requirements of this rule.

1.2 RELATED REQUIREMENTS

- A. Divisions 01 through 33 contain related requirements specific to the work of each of these Sections. Requirements may or may not include reference to this Section.
- B. Section 01 8113, Sustainable Design Requirements, for CAL-Green general requirements and procedures.

1.3 REFERENCES

- A. California Green Building Standards Code (CALGreen), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. Low-Emitting Materials Product List; California Collaborative for High Performance Schools (CHPS); current edition at www.chps.net/.
- C. CRI (GLCC) - Green Label Testing Program - Approved Product Categories for Carpet Cushion; Carpet and Rug Institute; current edition.
- D. CRI (GLP) - Green Label Plus Carpet Testing Program - Approved Products; Carpet and Rug Institute; current edition.
- E. GEI (SCH) - GREENGUARD "Children and Schools" Certified Products; GREENGUARD Environmental Institute; current listings at www.greenguard.org.

VOLATILE ORGANIC COMPOUND (VOC) RESTRICTIONS

SECTION 01 6116

3595001

- F. GreenSeal GS-36 - Commercial Adhesives; Green Seal, Inc.
- G. SCAQMD 1168 - South Coast Air Quality Management District Rule No.1168; current edition; www.aqmd.gov.
- H. SCS (CPD) - SCS Certified Products; Scientific Certification Systems; current listings at www.scs-certified.com.

1.4 DEFINITIONS

- A. VOC-Restricted Products: Products of each of the following categories when installed or applied on-site:
 - 1. Adhesives, sealants, and sealer coatings, regardless of specification Section or Division.
 - 2. Paints and coatings.
 - 3. Carpet and resilient flooring.
 - 4. Composite wood products; plywood, particleboard, wood fiberboard.
- B. Adhesives: Gunnable, trowelable, liquid-applied, and aerosol adhesives, whether specified or not; including flooring adhesives, resilient base adhesives, and pipe jointing adhesives.
- C. Sealants: Gunnable, trowelable, and liquid-applied joint sealants and sealant primers, whether specified or not; including firestopping sealants and duct joint sealers.

1.5 SUBMITTAL REQUIREMENTS

- A. Product Data: For each VOC-restricted product used in the project, submit product data showing compliance, except when another type of evidence of compliance is required.
- B. Verification of Compliance: Submit for each different product in each applicable category.
 - 1. Identify evidence submittals with the words "CALGreen VOC Compliance Report".
- C. Installer Certifications for Accessory Materials:
 - 1. Require each installer of any type of product, not just the products for which VOC restrictions are specified, to certify that either 1) no adhesives, joint sealants, paints, coatings, or composite wood or agrifiber products have been used in the installation of their products, or 2) that such products used comply with these requirements.
 - 2. Use the form following at the end of Part 3 in this Section for Installer certifications.

1.6 QUALITY ASSURANCE

- A. Manufacturer's Testing Agency Qualifications: Independent firm specializing in performing testing and inspections of the type specified in this Section.

VOLATILE ORGANIC COMPOUND (VOC) RESTRICTIONS
SECTION 01 6116
3595001

PART 2 - PRODUCTS

2.1 MATERIALS

A. General:

1. Provide products conforming to local, State and Federal government requirements limiting the amount of volatile organic compounds contained in the product, for its intended application. If specified product exceeds current requirement, provide conforming product at no additional cost.
2. Provide only products having volatile organic compound (VOC) content not greater than required by South Coast Air Quality Management District Rule No.1168 and less where required by code.
3. Products are specified in multiple Sections throughout these Specifications.

B. Composite Wood Products: Comply with CALGreen Section 5.504 and Table 5.504.4.5 formaldehyde limits for hardwood plywood, particleboard, and medium density fiberboard composite wood products used on the interior and exterior of the building.

1. Verification of Compliance: Acceptable types are:
 - a. Certification by manufacturer that product complies with requirements.
 - b. Published product data showing compliance with requirements.
 - c. Chain of custody certifications.
 - d. Product labeled and invoiced as meeting the Composite Wood Products regulation (CCR, Title 17, Section 93120, et seq.).
 - e. Products marked as meeting the PS-1 or PS-2 standards of the Engineered Wood Association, the Australian AS/NZS 2269, or European 636 3S standards.
 - f. Other method acceptable to enforcing agency.

Table 5.504.4.5 FORMALDEHYDE LIMITS	
Maximum Formaldehyde Emissions in Parts per Million	
Product	Current Limit
Hardwood plywood veneer core	0.05
Hardwood plywood composite core	0.05
Particleboard	0.09
Medium density fiberboard	0.11
Thin medium density fiberboard ¹	0.13
Note 1: Thin medium density fiberboard has a maximum thickness of 5/16 inch (8 mm).	

C. Joint Sealants: Comply with CALGreen Section 5.504 and Table 5.504.4.2.

1. Verification of Compliance: Acceptable types are:
 - a. Report of laboratory testing performed in accordance with requirements.
 - b. Published product data showing compliance with requirements.

VOLATILE ORGANIC COMPOUND (VOC) RESTRICTIONS
SECTION 01 6116
3595001

- c. Certification by manufacturer that product complies with requirements.
- 2. Products used shall comply with the following limits.

Table 5.504.4.2 SEALANT VOC LIMIT	
Less Water and Less Exempt Compounds in Grams per Liter	
Sealant	Current VOC Limit
Architectural	250
Marine Deck	760
Non-Membrane Roof	300
Roadway	250
Single-Ply Roof Membrane	450
Other	420
Sealant Primers	Current VOC Limit
Architectural	
Non-Porous	250
Porous	775
Modified Bituminous	500
Marine Deck	760
Other	750
For low-solid adhesives or sealants the VOC limit is expressed in grams per liter of material; for all other adhesives and sealants, VOC limits are expressed as grams of VOC per liter of adhesive or sealant less water and less exempt compounds.	

- D. Paints and Coatings: Comply with CALGreen Section 5.504 and Table 5.504.4.3 based on the California Air Resources Board, Architectural Coatings Suggested Control Measure.
 - 1. Determination of VOC Content: Testing and calculation in accordance with 40 CFR 59, Subpart D (EPA Method 24), exclusive of colorants added to a tint base and water added at Project site; or other method acceptable to authorities having jurisdiction.
 - a. Verification of Compliance: Acceptable types are:
 - 1) Report of laboratory testing performed in accordance with requirements.
 - 2) Published product data showing compliance with requirements.
 - 3) Certification by manufacturer that product complies with requirements.
 - 2. Provide coatings that comply with the most stringent requirements specified in the following:
 - a. 40 CFR 59, Subpart D--National Volatile Organic Compound Emission Standards for Architectural Coatings.
 - b. South Coast Air Quality Management District Rule No.1168.
 - 3. Products used shall comply with the following limits.

VOLATILE ORGANIC COMPOUND (VOC) RESTRICTIONS
SECTION 01 6116
3595001

Table 5.504.4.3 VOC CONTENT LIMITS FOR ARCHITECTURAL COATINGS (See Notes 2 & 3 below)	
Grams of VOC per Liter of Coating, less water and less exempt compounds	
Coating Category	Current VOC Limit 1/1/2012
Flat Coatings	50
Non-Flat Coatings	100
Non-Flat High Gloss Coatings	150
Specialty Coatings	
Aluminum Roof Coatings	400
Basement Specialty Coatings	400
Bituminous Roof Coatings	50
Bituminous Roof Primers	350
Bond Breakers	350
Concrete Curing Compounds	350
Concrete / Masonry Sealers	100
Driveway Sealers	50
Dry Fog Coatings	150
Faux Finishing Coatings	350
Fire Resistive Coatings	350
Floor Coatings	100
Form-Release Compounds	250
Graphic Arts Coatings (Sign Paints)	500
High-Temperature Coatings	420
Industrial Maintenance Coatings	250
Low Solids Coatings (See Note 1 below)	120
Magnesite Cement Coatings	450
Mastic Texture Coatings	100
Metallic Pigmented Coatings	500
Multicolor Coatings	250
Pretreatment Wash Primers	420
Primers, Sealers and Undercoaters	100
Reactive Penetrating Sealers	350
Recycled Coatings	250
Roof Coatings	50
Rust Preventative Coatings	250
Shellacs:	
Clear	730
Opaque	550
Specialty Primers, Sealers and Undercoaters	100
Stains	250
Stone Consolidants	450
Swimming Pool Coatings	340
Traffic Marking Coatings	100
Waterproofing Membranes	250
Wood Coatings	275

VOLATILE ORGANIC COMPOUND (VOC) RESTRICTIONS
SECTION 01 6116
3595001

Table 5.504.4.3 VOC CONTENT LIMITS FOR ARCHITECTURAL COATINGS (See Notes 2 & 3 below)	
Grams of VOC per Liter of Coating, less water and less exempt compounds	
Coating Category	Current VOC Limit 1/1/2012
Wood Preservatives	350
Zinc Rich Primers	340
Note 1: Grams of VOC per liter of coating including water and including exempt compounds	
Note 2: Not Applicable	
Note 3: Values in this table are derived from those specified by the California Air Resources Board, Architectural Coatings Suggested Control Measure, February 1, 2008. More information is available from the Air Resources Board.	

4. Restricted Components: In addition to the specified VOC limits, paints and coatings shall not contain any of the following:
- Acrolein.
 - Acrylonitrile.
 - Antimony.
 - Benzene.
 - Butyl benzyl phthalate.
 - Cadmium.
 - Di (2-ethylhexyl) phthalate.
 - Di-n-butyl phthalate.
 - Di-n-octyl phthalate.
 - 1,2-dichlorobenzene.
 - Diethyl phthalate.
 - Dimethyl phthalate.
 - Ethylbenzene.
 - Formaldehyde.
 - Hexavalent chromium.
 - Isophorone.
 - Lead.
 - Mercury.
 - Methyl ethyl ketone.
 - Methyl isobutyl ketone.
 - Methylene chloride.
 - Naphthalene.
 - Toluene (methylbenzene).
 - 1,1,1-trichloroethane.

- y. Vinyl chloride.

PART 3 - EXECUTION

3.1 FIELD QUALITY CONTROL

- A. Owner reserves the right to reject non-compliant products, whether installed or not, and require their removal and replacement with compliant products at no extra cost to Owner.
- B. Additional costs to restore indoor air quality, including fines by authorities, due to installation of non-compliant products shall be borne by Contractor.

3.2 CERTIFICATION FORM

- A. Use of this Form:
 - 1. Because installers are allowed and directed to choose accessory materials suitable for the applicable installation, there is a possibility that such accessory materials might contain VOC content in excess of that permitted, especially where such materials have not been explicitly specified.
 - 2. Contractor is required to obtain and submit this Form from each installer of work on this project.
 - 3. For each product category listed, circle the correct words in brackets: either [HAS] or [HAS NOT].
 - 4. If these accessory materials have been used, attach to this form product data and MSDS sheet for each such product.

(The Remainder of this Page is Intentionally Left Blank)

VOLATILE ORGANIC COMPOUND (VOC) RESTRICTIONS
SECTION 01 6116
3595001

ACCESSORY MATERIAL VOC CONTENT CERTIFICATION FORM

IDENTIFICATION:

Project Name: _____

Project No.: _____

Architect: _____

PRODUCT CERTIFICATION: I certify that the installation work of my firm on this project:

1. [HAS] [HAS NOT] required the use of any ADHESIVES.
2. [HAS] [HAS NOT] required the use of any JOINT SEALANTS.
3. [HAS] [HAS NOT] required the use of any PAINTS OR COATINGS.
4. [HAS] [HAS NOT] required the use of any COMPOSITE WOOD or AGRIFIBER PRODUCTS.

Product data and MSDS sheets are attached.

CERTIFIED BY (Installer/Manufacturer/Supplier Firm):

Firm Name: _____

Print Name: _____

Signature: _____

Title: _____ (officer of company)

Date: _____

END OF SECTION

*p:\sacramento\3595 tracy unified school district\001-000_villalovoz es new shade structures\08 specifications\06 spec\04
final\jacobson\01 6116_volatile organic compound (voc) restrictions.docx
Last Updated: January 18, 2022*

SECTION 01 66 00

PRODUCT DELIVERY, STORAGE AND HANDLING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Site Access, Conditions and Requirements;
- B. Special Conditions.

1.02 PRODUCTS

- A. Products are as defined in the General Conditions.
- B. Contractor shall not use and/or reuse materials and/or equipment removed from existing Premises, except as specifically permitted by the Contract Documents.
- C. Contractor shall provide interchangeable components of the same manufacturer, for similar components.

1.03 TRANSPORTATION AND HANDLING

- A. Contractor shall transport and handle Products in accordance with manufacturer's instructions.
- B. Contractor shall promptly inspect shipments to confirm that Products comply with requirements, quantities are correct, and products are undamaged.
- C. Contractor shall provide equipment and personnel to handle Products by methods to prevent soiling, disfigurement, or damage.

1.04 STORAGE AND PROTECTION

- A. Contractor shall store and protect Products in accordance with manufacturer's instructions, with seals and labels intact and legible. Contractor shall store sensitive products in weather-tight, climate controlled enclosures.
- B. For exterior storage of fabricated Products, Contractor shall place on sloped supports, above ground.
- C. Contractor shall provide off-site storage and protection when Site does not permit on-site storage or protection.

- D. Contractor shall cover products subject to deterioration with impervious sheet covering and provide ventilation to avoid condensation.
- E. Contractor shall store loose granular materials on solid flat surfaces in a well-drained area and prevent mixing with foreign matter.
- F. Contractor shall provide equipment and personnel to store Products by methods to prevent soiling, disfigurement, or damage.
- G. Contractor shall arrange storage of Products to permit access for inspection and periodically inspect to assure Products are undamaged and are maintained under specified conditions.

PART 2 – PRODUCTS Not Used.

PART 3 - EXECUTION Not Used.

END OF DOCUMENT

CUTTING AND PATCHING

PART 1 – GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Inspector, Inspections, and Tests, Integration of Work, Nonconforming Work, and Correction of Work, and Uncovering Work;
- B. Special Conditions;
- C. Imported Materials Certification.

1.02 CUTTING AND PATCHING:

- A. Contractor shall be responsible for all cutting, fitting, and patching, including associated excavation and backfill, required to complete the Work or to:
 - (1) Make several parts fit together properly.
 - (2) Uncover portions of Work to provide for installation of ill-timed Work.
 - (3) Remove and replace defective Work.
 - (4) Remove and replace Work not conforming to requirements of Contract Documents.
 - (5) Remove Samples of installed Work as specified for testing.
 - (6) Provide routine penetrations of non-structural surfaces for installation of piping and electrical conduit.
 - (7) Attaching new materials to existing remodeling areas – including painting (or other finishes) to match existing conditions.
- B. In addition to Contract requirements, upon written instructions from the District, Contractor shall uncover Work to provide for observations of covered Work in accordance with the Contract Documents; remove samples of installed materials for testing as directed by District; and remove Work to provide for alteration of existing Work.
- C. Contractor shall not cut or alter Work, or any part of it, in such a way that endangers or compromises the integrity of the Work, the Project, or work of others.

1.03 SUBMITTALS:

- A. Prior to any cutting or alterations that may affect the structural safety of Project, or work of others, and well in advance of executing such cutting or alterations, Contractor shall submit written notice to District pursuant to the applicable notice provisions of the Contract Documents, requesting consent to proceed with the cutting or alteration, including the following:
 - (1) The work of the District or other trades.
 - (2) Structural value or integrity of any element of Project.
 - (3) Integrity or effectiveness of weather-exposed or weather-resistant elements or systems.
 - (4) Efficiency, operational life, maintenance or safety of operational elements.
 - (5) Visual qualities of sight-exposed elements.
- B. Contractor's Request shall also include:
 - (1) Identification of Project.
 - (2) Description of affected Work.
 - (3) Necessity for cutting, alteration, or excavations.
 - (4) Effects of Work on District, other trades, or structural or weatherproof integrity of Project.
 - (5) Description of proposed Work:
 - (a) Scope of cutting, patching, alteration, or excavation.
 - (b) Trades that will execute Work.
 - (c) Products proposed to be used.
 - (d) Extent of refinishing to be done.
 - (6) Alternates to cutting and patching.
 - (7) Cost proposal, when applicable.
 - (8) The scheduled date the Contractor intends to perform the Work and the duration of time to complete the Work.
 - (9) Written permission of District or other District contractor(s) whose work will be affected.

1.04 QUALITY ASSURANCE:

- A. Contractor shall ensure that cutting, fitting, and patching shall achieve security, strength, weather protection, appearance for aesthetic match, efficiency, operational life, maintenance, safety of operational elements, and the continuity of existing fire ratings.
- B. Contractor shall ensure that cutting, fitting, and patching shall successfully duplicate undisturbed adjacent profiles, materials, textures, finishes, colors, and that materials shall match existing construction. Where there is dispute as to whether duplication is successful or has been achieved to a reasonable degree, the District's decision shall be final.

1.05 PAYMENT FOR COSTS:

- A. Cost caused by ill-timed or defective Work or Work not conforming to Contract Documents, including costs for additional services of the District, its consultants, including but not limited to the Construction Manager, the Architect, the Project Inspector(s), Engineers, and Agents, will be paid by Contractor and/or deducted from the Contract by the District.
- B. District shall only pay for cost of Work if it is part of the original Contract Price or if a change has been made to the contract in compliance with the provisions of the General Conditions. Cost of Work performed upon instructions from the District, other than defective or nonconforming Work, will be paid by District on approval of written Change Order. Contractor shall provide written cost proposals prior to proceeding with cutting and patching.

PART 2 - PRODUCTS

2.01 MATERIALS:

- A. Contractor shall provide for replacement and restoration of Work removed. Contractor shall comply with the Contract Documents and with the Industry Standard(s), for the type of Work, and the Specification requirements for each specific product involved. If not specified, Contractor shall first recommend a product of a manufacturer or appropriate trade association for approval by the District.
- B. Materials to be cut and patched include those damaged by the performance of the Work.

PART 3 – EXECUTION

3.01 INSPECTION:

- A. Contractor shall inspect existing conditions of the Site and the Work, including elements subject to movement or damage during cutting and patching, excavating and backfilling. After uncovering Work, Contractor shall inspect conditions affecting installation of new products.

- B. Contractor shall report unsatisfactory or questionable conditions in writing to District as indicated in the General Conditions and shall proceed with Work as indicated in the General Conditions by District.

3.02 PREPARATION:

- A. Contractor shall provide shoring, bracing and supports as required to maintain structural integrity for all portions of the Project, including all requirements of the Project.
- B. Contractor shall provide devices and methods to protect other portions of Project from damage.
- C. Contractor shall, provide all necessary protection from weather and extremes of temperature and humidity for the Project, including without limitation, any work that may be exposed by cutting and patching Work. Contractor shall keep excavations free from water.

3.03 ERECTION, INSTALLATION AND APPLICATION:

- A. With respect to performance, Contractor shall:
 - (1) Execute fitting and adjustment of products to provide finished installation to comply with and match specified tolerances and finishes.
 - (2) Execute cutting and demolition by methods that will prevent damage to other Work, and provide proper surfaces to receive installation of repairs and new Work.
 - (3) Execute cutting, demolition excavating, and backfilling by methods that will prevent damage to other Work and damage from settlement.
- B. Contractor shall employ original installer or fabricator to perform cutting and patching for:
 - (1) Sight-exposed finished surfaces.
- C. Contractor shall execute fitting and adjustment of products to provide a finished installation to comply with specified products, functions, tolerances, and finishes as shown or specified in the Contract Documents including, without limitation, the Drawings and Specifications.
- D. Contractor shall fit Work airtight to pipes, sleeves, conduit, and other penetrations through surfaces. Contractor shall conform to all Code requirements for penetrations or the Drawings and Specifications, whichever calls for a higher quality or more thorough requirement. Contractor shall maintain integrity of both rated and non-rated fire walls, ceilings, floors, etc.
- E. Contractor shall restore Work which has been cut or removed. Contractor shall install new products to provide completed Work in accordance with requirements of the Contract Documents and as required to match surrounding areas and surfaces.

- F. Contractor shall refinish all continuous surfaces to nearest intersection as necessary to match the existing finish to any new finish.

END OF DOCUMENT

ALTERATION PROJECT PROCEDURES

PART 1 – GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Integration of Work, Purchase of Materials and Equipment, Uncovering of Work and Non-conforming Work and Correction of Work and Trenches;
- B. Special Conditions.

PART 2 - PRODUCTS

2.01 PRODUCTS FOR PATCHING AND EXTENDING WORK:

- A. New Materials: As specified in the Contract Documents including, without limitation, in the Specifications, Contractor shall match existing products, conditions, and work for patching and extending work.
- B. Type and Quality of Existing Products: Contractor shall determine by inspection, by testing products where necessary, by referring to existing conditions and to the Work as a standard.

PART 3 - EXECUTION

3.01 EXAMINATION:

- A. Contractor shall verify that demolition is complete and that areas are ready for installation of new Work.
- B. By beginning restoration Work, Contractor acknowledges and accepts the existing conditions.

3.02 PREPARATION:

- A. Contractor shall cut, move, or remove items as necessary for access to alterations and renovation Work. Contractor shall replace and restore these at completion.
- B. Contractor shall remove unsuitable material not as salvage unless otherwise indicated in the Contract Documents. Unsuitable material may include, without limitation, rotted wood, corroded metals, and deteriorated masonry and concrete. Contractor shall replace materials as specified for finished Work.

- C. Contractor shall remove debris and abandoned items from all areas of the Site and from concealed spaces.
- D. Contractor shall prepare surface and remove surface finishes to provide for proper installation of new Work and finishes.

3.03 INSTALLATION:

- A. Contractor shall coordinate Work of all alternations and renovations to expedite completion and to accommodate District occupancy.
- B. Designated Areas and Finishes: Contractor shall complete all installations in all respects, including operational, and electrical work.
- C. Contractor shall remove, cut, and patch Work in a manner to minimize damage and to provide a means of restoring Products and finishes to original or specified condition.
- D. Contractor shall refinish visible existing surfaces to remain to specified condition for each material, with a neat and square or straight transition to adjacent finishes.
- E. Contractor shall install products as specified in the Contract Documents, including without limitation, the Specifications.

3.04 TRANSITIONS:

- A. Where new Work abuts or aligns with existing, Contractor shall perform a smooth and even transition. Patched Work must match existing adjacent work in texture and appearance.
- B. When finished surfaces are cut so that a smooth transition with new Work is not possible, Contractor shall terminate existing surface along a straight line at a natural line of division and make a recommendation for resolution to the District and the Architect for review and approval.

3.05 ADJUSTMENTS:

- A. Where a change of plane of 1/4 inch or more occurs, Contractor shall submit a recommendation for providing a smooth transition to the District and the Architect for review and approval.
- B. Contractor shall fit Work at penetrations of surfaces.

3.06 REPAIR OF DAMAGED SURFACES:

- A. Contractor shall patch or replace portions of existing surfaces, which are damaged, lifted, discolored, or showing other imperfections, in the area where the Work is performed.
- B. Contractor shall repair substrate prior to patching finish.

3.07 CULTIVATED AREAS AND OTHER SURFACE IMPROVEMENTS:

- A. Cultivated or planted areas and other surface improvements which are damaged by actions of the Contractor shall be restored by Contractor to their original condition or better, where indicated.
- B. Contractor shall protect and replace, if damaged, all existing guard posts, barricades, and fences.
- C. Contractor shall give special attention to avoid damaging or killing trees, bushes and/or shrubs on the Premises and/or identified in the Contract Documents, including without limitation, the Drawings.

3.08 FINISHES:

- A. Contractor shall finish surfaces as specified in the Contract Documents, including without limitations, the provisions of all Divisions of the Specifications.
- B. Contractor shall finish patches to produce uniform finish and texture over entire area. When finish cannot be matched, Contractor shall refinish entire surface to nearest intersections.

3.09 CLEANING:

- A. Contractor shall continually clean the Site and the Premises as indicated in the Contract Documents, including without limitation, the provisions in the General Conditions and the Specifications regarding cleaning.

END OF DOCUMENT

CONTRACT CLOSEOUT AND FINAL CLEANING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Completion of Work;
- B. Special Conditions;
- C. Temporary Facilities and Controls.

1.02 CLOSEOUT PROCEDURES

Contractor shall comply with all closeout provisions as indicated in the General Conditions.

1.03 FINAL CLEANING

- A. Contractor shall execute final cleaning prior to final inspection.
- B. Contractor shall clean interior and exterior glass and all surfaces exposed to view; remove temporary labels, tape, stains, and foreign substances, polish transparent and glossy surfaces, wax and polish new vinyl floor surfaces, vacuum carpeted and soft surfaces.
- C. Contractor shall clean equipment and fixtures to a sanitary condition.
- D. Contractor shall replace filters of operating equipment.
- E. Contractor shall clean debris from roofs, gutters, down spouts, and drainage systems.
- F. Contractor shall clean Site, sweep paved areas, and rake clean landscaped surfaces.
- G. Contractor shall remove waste and surplus materials, rubbish, and construction facilities from the Site and surrounding areas.

1.04 ADJUSTING

Contractor shall adjust operating products and equipment to ensure smooth and unhindered operation.

1.05 RECORD DOCUMENTS AND SHOP DRAWINGS

- A. Contractor shall legibly mark each item to record actual construction, including:
 - (1) Measured depths of foundation in relation to finish floor datum.
 - (2) Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permit surface improvements.
 - (3) Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.
 - (4) Field changes of dimension and detail.
 - (5) Details not on original Contract Drawings
 - (6) Changes made by modification(s).
 - (7) References to related Shop Drawings and modifications.
- B. Contractor will provide one set of Record Drawings to District.
- C. Contractor shall submit all required documents to District and/or Architect prior to or with its final Application for Payment.

1.06 INSTRUCTION OF DISTRICT PERSONNEL

- A. Before final inspection, at agreed upon times, Contractor shall instruct District's designated personnel in operation, adjustment, and maintenance of products, equipment, and systems.
- B. For equipment requiring seasonal operation, Contractor shall perform instructions for other seasons within six months or by the change of season.
- C. Contractor shall use operation and maintenance manuals as basis for instruction. Contractor shall review contents of manual with personnel in detail to explain all aspects of operation and maintenance.
- D. Contractor shall prepare and insert additional data in Operation and Maintenance Manual when the need for such data becomes apparent during instruction.
- E. Contractor shall review contents of manual with personnel in detail to explain all aspects of operation and maintenance.

1.07 SPARE PARTS AND MAINTENANCE MATERIALS

- A. Contractor shall provide products, spare parts, maintenance, and extra materials in quantities specified in the Specifications and in Manufacturer's recommendations.

- B. Contractor shall provide District with all required Operation and Maintenance Data at one time. Partial or piecemeal submissions of Operation and Maintenance Data will not be accepted.

PART 2 – PRODUCTS Not Used.

PART 3 – EXECUTION Not Used.

END OF DOCUMENT

OPERATION AND MAINTENANCE DATA

PART 1 – GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Completion of the Work;
- B. Special Conditions.

1.02 QUALITY ASSURANCE:

Contractor shall prepare instructions and data by personnel experienced in maintenance and operation of described products.

1.03 FORMAT:

- A. Contractor shall prepare data in the form of an instructional manual entitled "OPERATIONS AND MAINTENANCE MANUAL & INSTRUCTIONS" ("Manual").
- B. Binders: Contractor shall use commercial quality, 8-1/2 by 11 inch, three-side rings, with durable plastic covers; two inch maximum ring size. When multiple binders are used, Contractor shall correlate data into related consistent groupings.
- C. Cover: Contractor shall identify each binder with typed or printed title "OPERATION AND MAINTENANCE MANUAL & INSTRUCTIONS"; and shall list title of Project and identify subject matter of contents.
- D. Contractor shall arrange content by systems process flow under section numbers and sequence of Table of Contents of the Contract Documents.
- E. Contractor shall provide tabbed fly leaf for each separate product and system, with typed description of product and major component parts of equipment.
- F. Text: The content shall include Manufacturer's printed data, or typewritten data on 24 pound paper.
- G. Drawings: Contractor shall provide with reinforced punched binder tab and shall bind in with text; folding larger drawings to size of text pages.

1.04 CONTENTS, EACH VOLUME:

- A. Table of Contents: Contractor shall provide title of Project; names, addresses, and telephone numbers of the Architect, any engineers, subconsultants, Subcontractor(s), and Contractor with name of responsible parties; and schedule of products and systems, indexed to content of the volume.

- B. For Each Product or System: Contractor shall list names, addresses, and telephone numbers of Subcontractor(s) and suppliers, including local source of supplies and replacement parts.
- C. Product Data: Contractor shall mark each sheet to clearly identify specific products and component parts, and data applicable to installation. Delete inapplicable information.
- D. Drawings: Contractor shall supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams. Contractor shall not use Project Record Documents as maintenance drawings.
- E. Text: Contractor shall include any and all information as required to supplement product data. Contractor shall provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions.
- F. Warranties and Bonds: Contractor shall bind in one copy of each.

1.05 MANUAL FOR MATERIALS AND FINISHES:

- A. Building Products, Applied Materials, and Finishes: Contractor shall include product data, with catalog number, size, composition, and color and texture designations. Contractor shall provide information for re-ordering custom manufactured products.
- B. Instructions for Care and Maintenance: Contractor shall include Manufacturer's recommendations for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.
- C. Moisture Protection and Weather Exposed Products: Contractor shall include product data listing applicable reference standards, chemical composition, and details of installation. Contractor shall provide recommendations for inspections, maintenance, and repair.
- D. Additional Requirements: Contractor shall include all additional requirements as specified in the Specifications.
- E. Contractor shall provide a listing in Table of Contents for design data, with tabbed fly sheet and space for insertion of data.

1.06 MANUAL FOR EQUIPMENT AND SYSTEMS:

- A. Each Item of Equipment and Each System: Contractor shall include description of unit or system, and component parts and identify function, normal operating characteristics, and limiting conditions. Contractor shall include performance curves, with engineering data and tests, and complete nomenclature, and commercial number of replaceable parts.
- B. Panelboard Circuit Directories: Contractor shall provide electrical service characteristics, controls, and communications.

- C. Contractor shall include color coded wiring diagrams as installed.
- D. Operating Procedures: Contractor shall include start-up, break-in, and routine normal operating instructions and sequences. Contractor shall include regulation, control, stopping, shut-down, and emergency instructions. Contractor shall include summer, winter, and any special operating instructions.
- E. Maintenance Requirements: Contractor shall include routine procedures and guide for trouble-shooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.
- F. Contractor shall provide servicing and lubrication schedule, and list of lubricants required.
- G. Contractor shall include manufacturer's printed operation and maintenance instructions.
- H. Contractor shall include sequence of operation by controls manufacturer.
- I. Contractor shall provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.
- J. Contractor shall provide control diagrams by controls manufacturer as installed.
- K. Contractor shall provide Contractor's coordination drawings, with color coded piping diagrams as installed.
- L. Contractor shall provide charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams.
- M. Contractor shall provide list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.
- N. Additional Requirements: Contractor shall include all additional requirements as specified in Specification(s).
- O. Contractor shall provide a listing in Table of Contents for design data, with tabbed fly sheet and space for insertion of data.

1.07 SUBMITTAL:

- A. Contractor shall submit to the District for review two (2) copies of preliminary draft or proposed formats and outlines of the contents of the Manual within thirty (30) days of Contractor's start of Work.
- B. For equipment, or component parts of equipment put into service during construction and to be operated by District, Contractor shall submit draft content for that portion of the Manual within ten (10) days after acceptance of that equipment or component.

- C. Contractor shall submit two (2) copies of a complete Manual in final form prior to final Application for Payment. Copy will be returned with Architect/Engineer comments. Contractor must revise the content of the Manual as required by District prior to District's approval of Contractor's final Application for Payment.
- D. Contractor must submit two (2) copies of revised Manual in final form within ten (10) days after final inspection.

PART 2 – PRODUCTS Not Used.

PART 3 – EXECUTION Not Used.

END OF DOCUMENT

WARRANTIES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Warranty/Guarantee Information;
- B. Special Conditions.

1.02 FORMAT

- A. Binders: Contractor shall use commercial quality, 8-1/2 by 11 inch, three-side rings, with durable plastic covers; two inch maximum ring size.
- B. Cover: Contractor shall identify each binder with typed or printed title "WARRANTIES" and shall list title of Project.
- C. Table of Contents: Contractor shall provide title of Project; name, address, and telephone number of Contractor and equipment supplier; and name of responsible principal. Contractor shall identify each item with the number and title of the specific Specification, document, provision, or section in which the name of the product or work item is specified.
- D. Contractor shall separate each warranty with index tab sheets keyed to the Table of Contents listing, providing full information and using separate typed sheets as necessary. Contractor shall list each applicable and/or responsible Subcontractor(s), supplier(s), and/or manufacturer(s), with name, address, and telephone number of each responsible principal(s).

1.03 PREPARATION:

- A. Contractor shall obtain warranties, executed in duplicate by each applicable and/or responsible subcontractor(s), supplier(s), and manufacturer(s), within ten (10) days after completion of the applicable item or work. Except for items put into use with District's permission, Contractor shall leave date of beginning of time of warranty blank until the date of completion is determined.
- B. Contractor shall verify that documents are in proper form, contain full information, and are notarized, when required.
- C. Contractor shall co-execute submittals when required.
- D. Contractor shall retain warranties until time specified for submittal.

1.04 TIME OF SUBMITTALS:

- A. For equipment or component parts of equipment put into service during construction with District's permission, Contractor shall submit a draft warranty for that equipment or component within ten (10) days after acceptance of that equipment or component.
- B. Contractor shall submit for District approval all warranties and related documents within ten (10) days after date of completion. Contractor must revise the warranties as required by the District prior to District's approval of Contractor's final Application for Payment.
- C. For items of work delayed beyond date of completion, Contractor shall provide an updated submittal within ten (10) days after acceptance, listing the date of acceptance as start of warranty period.

PART 2 - PRODUCTS Not Used.

PART 3 – EXECUTION Not Used.

END OF DOCUMENT

(Letterhead of Contractor)

STANDARD GUARANTEE / WARRANTY

for

Project Name

Contract No.

We hereby warrant that the Work we have provided under the above reference Contract has been completed in accordance with the Drawings, Specifications, and other Contract Documents.

Under the terms of this warranty, we agree to repair or replace any or all of our work, together with any other adjacent work which may be displaced or damaged by so doing, which may prove to be either patently defective in its workmanship or latently defective in its workmanship or materials within the period of 24 months from the date of filing of the Notice of Completion of the above named Project by the Board of Trustees of the School District, and we also agree to repair any and all damages resulting from such defects, without any expense whatsoever to said Board of Trustees, ordinary wear and tear and unusual abuse or neglect excepted.

In the event of our failure to comply with above-mentioned guarantee conditions within ten (10) day after being notified in writing by the Owner, we collectively and separately do hereby authorize the Owner to have said defective work and damages repaired or replaced and made good at our expense and will honor and pay the costs and charges therefore upon demand.

SIGNED (Contractor) _____

(Address)

(Printed Name of Authorized Representative)

Signature

(License Number)

(Date of Signing)

COUNTERSIGNED (Owner) _____

(Printed Name of Authorized Representative)

Signature

Date of Filing or Notice of Completion: _____

(Letterhead of Company)

SUBCONTRACTOR STANDARD GUARANTEE / WARRANTY

We hereby warrant that

which we have provided in _____

Name of Project _____

for

District

has been completed in accordance with Specification Section _____ and requirements of the Contract Documents.

Under the terms of this warranty, we agree to repair or replace any or all of our work, together with any other adjacent work which may be displaced or damaged by so doing, which may prove to be either patently defective in its workmanship or latently defective in its workmanship or materials within a period of 24 months from date of filing the Notice of Completion of the above-named Project by the Board of Trustees of the School District without any expense whatsoever to said Board of Trustees, ordinary wear and tear and unusual abuse or neglect excepted.

In the event of our failure to comply with above-mentioned guarantee conditions within ten (10) day after being notified in writing by the Owner, we collectively and separately do hereby authorize the Owner to have said defective work and damages repaired or replaced and made good at our expense and will honor and pay the costs and charges therefore upon demand.

SIGNED (Subcontractor)

(Signature)

(Company Name)

(Address)

(License Number) (Date of Signing)

(License Number) (Date of Signing)

COUNTERSIGNED (General Contractor)

(Signature)

(Company Name)

(Address)

(License Number) (Date of Signing)

(License Number) (Date of Signing)

(Letterhead of Company)

SPECIAL EXTENDED WRITTEN GUARANTEE / WARRANTY

We hereby warrant that

which we have provided in _____

Name of Project

for _____

District

has been completed in accordance with Specification Section _____ and requirements of the Contract Documents.

Under the terms of this warranty, we agree to repair or replace any or all of our work, together with any other adjacent work which may be displaced or damaged by so doing, which may prove to be either patently defective in its workmanship or latently defective in its workmanship or materials within a period of _____ year(s) from date of filing the Notice of Completion of the above-named Project by the Board of Trustees of the School District without any expense whatsoever to said Board of Trustees, ordinary wear and tear and unusual abuse or neglect excepted. We also agree to repair any and all damages resulting from such defects.

In the event of our failure to comply with above-mentioned conditions within a reasonable time but in no case longer than ten (10) calendar days after being notified in writing by the Owner, we collectively and separately do hereby authorize the Owner to have said defective work and damages repaired or replaced and made good at our expense and will honor and pay the costs and charges therefore upon demand.

SIGNED (Subcontractor)

(Name)

(Address)

(License Number)

(Date of Signing)

COUNTERSIGNED (General Contractor)

(Name)

(Address)

(License Number)

(Date of Signing)

RECORD DOCUMENTS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Documents on Work;
- B. Special Conditions.

PART 2 - RECORD DRAWINGS

2.01 GENERAL:

- A. As indicated in the Contract Documents, the District will provide Contractor with one set of reproducible, full size original Contract Drawings (mylars).
- B. Contractor shall maintain at each Project Site one set of marked-up plans and shall transfer all changes and information to those marked-up plans, as often as required in the Contract Documents, but in no case less than once each month. Contractor shall submit to the Project Inspector one set of reproducible vellums of the Project Record Drawings ("As-Built") showing all changes incorporated into the Work since the preceding monthly submittal. The As-Built shall be available at the Project Site. The Contractor shall submit reproducible vellums at the conclusion of the Project following review of the blue line prints.
- C. Label and date each Record Drawing "RECORD DOCUMENT" in legibly printed letters.
- D. All deviations in construction, including but not limited to pipe and conduit locations and deviations caused by without limitation Change Orders, Construction Claim Directives, RFI's, and Addenda, shall be accurately and legibly recorded by Contractor.
- E. Locations and changes shall be done by Contractor in a neat and legible manner and, where applicable, indicated by drawing a "cloud" around the changed or additional information.

2.02 RECORD DRAWING INFORMATION:

- A. Contractor shall record the following information:
 - (1) Locations of Work buried under or outside each building, including, without limitation, all utilities, plumbing and electrical lines, and conduits.

- (2) Actual numbering of each electrical circuit to match panel schedule.
- (3) Locations of significant Work concealed inside each building whose general locations are changed from those shown on the Contract Drawings.
- (4) Locations of all items, not necessarily concealed, which vary from the Contract Documents.
- (5) Installed location of all cathodic protection anodes.
- (6) Deviations from the sizes, locations, and other features of installations shown in the Contract Documents.
- (7) Locations of underground work, points of connection with existing utilities, changes in direction, valves, manholes, catch basins, capped stubouts, invert elevations, etc.
- (8) Sufficient information to locate Work concealed in each building with reasonable ease and accuracy.

In some instances, this information may be recorded by dimension. In other instances, it may be recorded in relation to the spaces in the building near which it was installed.

- B. Contractor shall provide additional drawings as necessary for clarification.
- C. Contractor shall provide reproducible record drawings, made from final Shop Drawings marked "No Exceptions Taken" or "Approved as Noted."
- D. After review and approval of the marked-up specifications by the Project Inspector, Contractor shall provide electronic copies of the drawings (in PDF format) with one file with all of the sheets and one set of individual sheet files at the conclusion of the Project.

PART 3 - RECORD SPECIFICATIONS

3.01 GENERAL:

- A. Contractor shall mark each section legibly to record manufacturer, trade name, catalog number, and supplier of each Product and item of equipment actually installed.
- B. After review and approval of the marked-up specifications by the Project Inspector, Contractor shall provide one electronic copy of the specifications (in PDF format) at the conclusion of the Project.

PART 4 - MAINTENANCE OF RECORD DOCUMENTS

4.01 GENERAL

- A. Contractor shall store Record Documents apart from documents used for construction as follows:

- (1) Provide files and racks for storage of Record Documents.
- (2) Maintain Record Documents in a clean, dry, legible condition and in good order.

B. Contractor shall not use Record Documents for construction purposes.

PART 5 – PRODUCTS Not Used.

END OF DOCUMENT

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes general requirements and procedures for compliance with California Code of Regulations, Title 24, Part 11 California Green Building Standards Code, "CAL-Green".

- 1. Chapter 5- Non-Residential Mandatory Measures.

1.2 RELATED REQUIREMENTS

- A. Pertinent sections specifying erosion control.
- B. Section 01 6116, Volatile Organic Compound (VOC) Restrictions.
- C. Document 01 5013, Construction Waste Management and Disposal.
- D. Document 01 7700, Contract Closeout and Final Cleaning.

1.3 DEFINITIONS

- A. CAL-Green Definitions: Certain terms are defined by CAL-Green in Chapter 5 of the code. Words and terms used in this section shall have the meanings shown therein.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Respond to questions and requests from Architect and the jurisdiction having authority regarding CAL-Green credits that are the responsibility of the Contractor, that depend on product selection or product qualities, or that depend on Contractor's procedures. Document responses as informational submittals.

1.5 SUBMITTALS

- A. CAL-GREEN Submittals: Submit CAL-GREEN submittals required by code and in other Specification Sections.
 - 1. CAL-GREEN submittals are in addition to other submittals. If submitted item is identical to that submitted to comply with other requirements, submit duplicate copies as a separate submittal to verify compliance with indicated CAL-GREEN requirements.
 - 2. Acceptable verification submittals are specified in the related sections.

SUSTAINABLE DESIGN REQUIREMENTS
SECTION 01 8113
3595001

PART 2 - PRODUCTS

2.1 REQUIREMENTS - GENERAL

- A. Provide products and procedures necessary to confirm CAL-GREEN compliance required in this Section. Although other Sections may specify some CAL-GREEN requirements, the Contractor shall determine additional materials, techniques, means, methods and procedures necessary to comply with CAL-GREEN requirements.

2.2 STORM WATER POLLUTION PREVENTION PLAN

- A. Section 5.106.1: Comply with requirements of this code section, local ordinances, General Conditions, Special Provisions, and related sections specifying erosion control.

2.3 OUTDOOR WATER USE

- A. Section 5.304.3.1: Irrigation Controllers: Comply with requirements of this code section, local ordinances and Section 32 8000.

2.4 CONSTRUCTION WASTE REDUCTION

- A. Section 5.408 Construction Waste Management, Diversion and Recycling: Comply with requirements of this code section, local ordinances and Section 01 7419.

2.5 BUILDING MAINTENANCE AND OPERATION

- A. Section 5.410.2.3, 4. Commissioning and Functional Performance Testing: Participate in Commissioning and provide functional performance testing as required by these code sections and as specified in Section 01 9113.
- B. Section 5.410.2.5. Documentation and Training: Provide Operations Training as required by these code sections and as specified in Section 01 7700 and Systems Manual as specified in Section 01 7700.

2.6 POLLUTANT CONTROL

- A. Section 5.504.3 Indoor Air Quality: Comply with requirements of this code section, local ordinances.
- B. Section 5.504.4 Finish Material Pollutant Control: All Finish materials shall comply with requirements of this code section, local ordinances and Section 01 6116.

PART 3 - EXECUTION

3.1 GENERAL

- A. Comply with Document 01 5013, Construction Waste Management and Disposal.

SUSTAINABLE DESIGN REQUIREMENTS
SECTION 01 8113
3595001

- B. Comply with execution requirements of related sections and applicable local codes and ordinances.

END OF SECTION

*p:\sacramento\3595 tracy unified school district\001-000_villalovoz es new shade structures\08 specifications\06 spec\04
final\jacobson\01 8113.10_sustainable design requirements (cal-green).docx
Last Updated: April 8, 2019*

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Sealants and backing for interior and exterior joints.

1.2 RELATED REQUIREMENTS

- A. Section 01 6116, Volatile Organic Compound (VOC) Restrictions, for VOC limits pertaining to adhesives, sealants, fillers, primers, and coatings.
- B. Section 01 8113, Sustainable Design Requirements, for CAL-Green general requirements and procedures.
- C. Pertinent Sections specifying sealants or referencing this Section for sealant products and installation requirements.
- D. Section 07 8413, Penetration Firestopping, for sealing joints in fire-resistance-rated construction.

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on Drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CAL Green), edition as noted on Drawings, as adopted by the California Division of the State Architect (DSA).
- C. American Concrete Institute (ACI) Publications and Standards:
 - 1. ACI 302.1R: Guide to Concrete Floor and Slab Construction.
 - 2. ACI 360R-10: Guide to Design of Slabs-on-Ground.
- D. ASTM International (ASTM):
 - 1. C834: Standard Specification for Latex Sealants.
 - 2. C919: Standard Practice for Use of Sealants in Acoustical Applications.
 - 3. C920: Standard Specification for Elastomeric Joint Sealants.
 - 4. C1193: Standard Guide for Use of Joint Sealants.
 - 5. C1247: Standard Test Method for Durability of Sealants Exposed to Continuous Immersion in Liquids.
 - 6. C1248: Standard Test Method for Staining of Porous Substrate by Joint Sealants.
 - 7. C1311: Standard Specification for Solvent Release Sealants.
 - 8. C1330: Standard Specification for Cylindrical Sealant Backing for Use with Cold Liquid-Applied Sealants.

JOINT SEALANTS
SECTION 07 9200
3595001

9. C1521: Standard Practice for Evaluating Adhesion of Installed Weatherproofing Sealant Joints.
 10. D1667: Standard Specification for Flexible Cellular Materials - Poly (Vinyl Chloride) Foam (Closed-Cell).
 11. E90: Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements.
- E. Federal Specifications (FS):
1. FS TT-S-001657: Sealing Compound--Single Component, Butyl Rubber Based, Solvent Release Type.
- F. South Coast Air Quality Management District (SCAQMD):
1. Rule 1168: Adhesive and Sealant Applications.
- G. U.S. Food & Drug Administration (FDA):
1. Code of Federal Regulations: Title 21, 21 CFR 177.2600, Rubber Articles Intended for Repeated Use.

1.4 DEFINITIONS

- A. Sealant Terminology in accordance with ASTM C834 and ASTM C920:
1. Type C: Clear / translucent sealant.
 2. Type OP: Opaque pigmented sealant.
 3. Type S: Single component sealant.
 4. Type M: Sealant with two or more components.
 5. Grade NS: Nonsag sealant.
 6. Grade P: Pourable sealant.
 7. Grade -18°C: Sealant with low temperature flexibility tested to -18°C (0°F).
 8. Grade 0°C: Sealant with low temperature flexibility tested to 0°C (32°F).
 9. Grade NF: Sealant does not meet low temperature flexibility requirements.
 10. Class 12-1/2: Sealant capable of handling movement, either contraction or expansion, of 12.5 percent of the original joint width.
 11. Class 25: Sealant capable of handling movement, either contraction or expansion, of 25 percent of the original joint width.
 12. Class 35: Sealant capable of handling movement, either contraction or expansion, of 35 percent of the original joint width.
 13. Class 50: Sealant capable of handling movement, either contraction or expansion, of 50 percent of the original joint width.
 14. Class 100 / 50: Sealant capable of handling movement of 50 percent contraction and 100 percent expansion.
 15. Use Related to Exposure:
 - a. Use NT: Nontraffic.
 - b. Use T: Traffic.
 - c. Use I: Immersible.

16. Use Related to Material:
 - a. Use A: Sealant used in contact with aluminum.
 - b. Use G: Sealant used in contact with glass.
 - c. Use M: Sealant used in contact with mortar.
 - d. Use O: Sealants used in contact with all other materials other than those previously listed.

1.5 ADMINISTRATIVE REQUIREMENTS

- A. Submittal Procedures:
 1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
 2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
 3. Sustainable Design Submittals shall comply with the additional requirement of Section 01 8113, Sustainable Design Requirements.
- B. Pre-Installation Meeting: Conduct at Project site. Review joint application procedures, compatibility tests, adhesion tests, and warranty requirements in a meeting involving Architect, Project Inspector, installer, manufacturer or manufacturer's representative.
- C. Coordination:
 1. Use of different manufacturer's sealant types for application at exterior wall and glazing systems is not permitted. It is required that a single source for silicone sealants be used on this Project. The Contractor is responsible for coordinating compliance with this requirement where installation of sealants is delegated to various Subcontractors installing the exterior envelope systems for the Project.
 2. Contractor shall coordinate and be responsible for compatibility and performance between sealants and other materials, and related Sections using sealants which may be in direct contact with work of this Section or adjacent to the other. Isolate and prevent of incompatibility between sealants in accordance with manufacturer's specifications, recommendations and instructions.

1.6 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated, demonstrate compliance with specified attributes.
 1. Include color chart from manufacturers for each joint sealant product required.
 2. Provide certification by joint sealant manufacturer that materials provided for this Section are 100 percent asbestos-free.
- B. Samples for initial Selection: In form of manufacturer's standard bead samples, consisting of strips of actual products showing full range of colors available, for each product exposed to view.

JOINT SEALANTS

SECTION 07 9200

3595001

- C. Samples for Verification: For each kind and color of joint sealant required, provide Samples with joint sealants in 1/2 inch wide joints formed between two 6 inch long strips of material matching the appearance of exposed surfaces adjacent to joint sealants.
- D. Joint-Sealant Schedule: Include the following information.
 - 1. Joint-sealant application, joint location, and designation.
 - 2. Joint-sealant manufacturer and product name.
 - 3. Joint-sealant formulation.
 - 4. Joint-sealant colors (multiple colors will be required).

1.7 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.
- B. Product Certificates: For each kind of joint sealant and accessory, from manufacturer.
- C. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, indicating that sealants comply with requirements.
 - 1. Preconstruction Compatibility and Adhesion Test Reports from sealant manufacturer, indicating the following:
 - a. Materials forming joint substrates and joint-sealant backings have been tested for compatibility and adhesion with joint sealants.
 - b. Interpretation of test results and written recommendations for primers and substrate preparation needed for adhesion.
 - 2. Preconstruction Field-Adhesion Test Reports: Indicate which sealants and joint preparation methods resulted in optimum adhesion to joint substrates based on testing specified in this Section.
- D. Sustainable Design:
 - 1. General:
 - a. Submit information necessary to establish and document compliance with the California Green Building Standards Code.
 - b. Sustainable design submittals are in addition to other submittals.
 - 2. The following information shall be provided:
 - a. Adhesives and Sealants: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.
- E. Sample of manufacturer's warranty.
- F. Record of Pre-Installation Meeting.

1.8 CLOSEOUT SUBMITTALS

- A. Warranty and Guarantee: Submit executed warranty and extended Contractor guarantee.

1.9 QUALITY ASSURANCE

- A. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for installation of sealants and backing required for this Project.
- B. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.
- C. Single Source Responsibility: Obtain each kind of joint sealant from single source from single manufacturer.
- D. Materials, components, assemblies, workmanship and installation are to be observed by the Project Inspector. Work not so inspected is subject to uncovering and replacement.
- E. Mockups: Install sealant in mockups of assemblies specified in other Sections that are indicated to receive joint sealants specified in this Section. Use materials and installation methods specified in this Section.

1.10 PRECONSTRUCTION TESTING

- A. Preconstruction Testing is not required if joint-sealant manufacturers submit joint preparation data that are based on previous testing, not older than 24 months, of sealant products for adhesion to, and compatibility with, joint substrates and other materials matching those submitted.
- B. Preconstruction Compatibility and Adhesion Testing: Submit to sealant manufacturers, for testing indicated below, samples of materials that will contact or affect joint sealants.
 - 1. Use manufacturer's standard test method to determine whether priming and other specific joint preparation techniques are required to obtain rapid, optimum adhesion of joint sealants to joint substrates.
 - 2. Submit not fewer than eight pieces of each kind of material, including joint substrates, shims, joint-sealant backings, secondary seals, and miscellaneous materials.
 - 3. Schedule sufficient time for testing and analyzing results to prevent delaying the Work.
 - 4. For materials failing tests, obtain joint-sealant manufacturer's written instructions for corrective measures including use of specially formulated primers.
- C. Preconstruction Field-Adhesion Testing: Before installing sealants, field test their adhesion to Project joint substrates as follows:
 - 1. Locate test joints where indicated on Project or, if not indicated, as directed by Architect.
 - 2. Conduct field tests for each kind of sealant and joint substrate indicated.
 - 3. Notify Architect seven days in advance of dates and times when test joints will be erected.
 - 4. Arrange for tests to take place with joint-sealant manufacturer's technical representative present.

JOINT SEALANTS
SECTION 07 9200
3595001

5. Test Method: Test joint sealants according to Method A, Field-Applied Sealant Joint Hand Pull Tab, in Appendix X1 in ASTM C 1193 or Method A, Tail Procedure, in ASTM C 1521.
 - a. For joints with dissimilar substrates, verify adhesion to each substrate separately; extend cut along one side, verifying adhesion to opposite side. Repeat procedure for opposite side.
6. Report whether sealant failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each kind of product and joint substrate. For sealants that fail adhesively, retest until satisfactory adhesion is obtained.
7. Evaluation of Preconstruction Field-Adhesion-Test Results: Sealants not evidencing adhesive failure from testing, in absence of other indications of noncompliance with requirements, will be considered satisfactory. Do not use sealants that fail to adhere to joint substrates during testing.

1.11 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials to project site in original factory wrappings and containers, labeled with identification of manufacturer, product name and designation, color, expiration period for use, pot life, curing time, and mixing instructions for multicomponent materials.
- B. Store and handle materials in compliance with manufacturer's recommendations to prevent their deterioration or damage due to moisture, high or low temperatures, contaminants, or other causes.

1.12 FIELD CONDITIONS

- A. Environmental Conditions: Do not proceed with installation of joint sealants under the following conditions:
 1. When ambient and substrate temperature conditions are outside the limits permitted by joint sealant manufacturer.
 2. When joint substrates are wet.
- B. Joint Width Conditions: Do not proceed with installation of joint sealants where joint widths are less than allowed by joint sealant manufacturer for application indicated.
- C. Joint Substrate Conditions: Do not proceed with installation of joint sealants until contaminants capable of interfering with their adhesion are removed from joint substrates.

1.13 WARRANTY AND GUARANTEE

- A. Manufacturer: In addition to the Contractor's and Subcontractor's Standard Guarantee, furnish Owner with manufacturer's fully executed written warranty for sealant against defects in materials and workmanship for a period of 5 years:
- B. Contractor: in addition to its standard Guarantee under the Contract, furnish Owner a special extended written five-year guarantee, cosigned by installer, for sealant, agreeing to replace any and all joints that leaks or otherwise fails to perform as required within guarantee period as a result of failure of materials or installation workmanship at no additional cost to the Owner.

PART 2 - PRODUCTS

2.1 DESIGN AND PERFORMANCE CRITERIA

- A. Sustainable Design:
 - 1. VOC emissions for field-applied adhesives, sealants, and sealant primers must comply with limits specified in Section 01 6116.
- B. Building Envelope: Make watertight and weatherproof.
 - 1. Exterior work that does not remain watertight and all work which does not retain all properties inherent in the product as stipulated by the manufacturer will be considered faulty.
- C. Provide elastomeric joint sealants that have been produced and installed to establish and to maintain watertight and airtight continuous seals without causing staining or deterioration of joint substrates.
- D. Provide joint sealants for interior applications that have been produced and installed to establish and maintain airtight continuous seals that are water resistant and cause no staining or deterioration of joint substrates.
- E. Design Requirements:
 - 1. Seal building joints with non-sag type sealant.
 - 2. Seal floor joints with self-leveling or slope grade self-leveling type sealant.

2.2 MATERIALS, GENERAL

- A. Compatibility: Provide joint sealants, joint fillers, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by sealant manufacturer based on testing and field experience.
- B. Liquid-Applied Joint Sealants: Comply with ASTM C920 and other requirements indicated for each liquid-applied joint sealant specified, including those referencing ASTM C920 classifications for type, grade, class, and uses related to exposure and joint substrates.
 - 1. Suitability for Immersion in Liquids. Where sealants are indicated for Use I for joints that will be continuously immersed in liquids, provide products that have undergone testing according to ASTM C 1247. Liquid used for testing sealants is deionized water, unless otherwise indicated.
- C. Stain-Test-Response Characteristics: Where sealants are specified to be non-staining to porous substrates, provide products that have undergone testing according to ASTM C 1248 and have not stained porous joint substrates indicated for Project.
- D. Suitability for Contact with Food: Where sealants are indicated for joints that will come in repeated contact with food, provide products that comply with 21 CFR 177.2600.

JOINT SEALANTS
SECTION 07 9200
3595001

E. Colors:

1. General:
 - a. Architect will provide color selections and locations for each sealant type and for Contractor's use.
 - b. Not all locations will have the same color.
 - c. Custom colors **[will] [may]** be required.
2. Provide color of exposed joint sealants to comply with the following:
 - a. Provide colors matching selections made by Architect from manufacturer's full range of colors for products of type indicated.
 - b. Request color selection for exposed products listed without a preselected color.

2.3 SILICONE JOINT SEALANTS

- A. Single-Component, Nonsag, Neutral-Curing Silicone Joint Sealant: ASTM C920, Type S, Grade NS, Class 100 / 50, for Use NT.
 1. Products: The following, or equal:
 - a. The Dow Chemical Company; "DOWSIL" 790.
 - b. Sika Corporation, Construction Products Division; "Sikasil" WS-290.
- B. Single-Component, Nonsag, Neutral-Curing Silicone Joint Sealant: ASTM C920, Type S, Grade NS, Class 50, for Use NT.
 1. Products: The following, or equal:
 - a. Dow Corning Corporation; "DOWSIL 795 Building Sealant".
 - b. Sika Corporation, Construction Products Division; "Sikasil WS-295."
- C. Single-Component, Nonsag, Non-Bleed, Neutral-Curing Silicone Joint Sealant: ASTM C920, Type S, Grade NS, Class 50, for Use G, M, A and O.
 1. Products: The following, or equal:
 - a. The Dow Chemical Company; "DOWSIL 756 SMS."
 - b. Momentive Performance Materials; "SCS9000 SilPruf NB."
- D. Single-Component, Nonsag, One Part RTV Neutral-Curing Silicone Joint Sealant: ASTM C920, Type S, Grade NS, Class 25, designed for adhering to low energy surfaces common in sheet or peel and stick weather resistant barriers.
 1. Products: The following, or equal:
 - a. The Dow Chemical Company; "DOWSIL" 758.
 - b. Sika Corporation, Construction Products Division; "Sikasil-N Plus."
- E. Mildew-Resistant, Single-Component, Acid-Curing Silicone Joint Sealant: ASTM C920, Type S, Grade NS, Class 25, for Use NT, A and O.
 1. Products: The following, or equal:
 - a. The Dow Chemical Company; "DOWSIL 786 Mildew Resistant."

- b. Momentive Performance Materials; GE Silicones “Sanitary SCS1700.”

2.4 URETHANE JOINT SEALANTS

- A. Single-Component, Nonsag, Urethane Joint Sealant: ASTM C920, Type S, Grade NS, Class 35, for Use NT.
 - 1. Products: The following, or equal:
 - a. BASF Master Builders Solutions; “MasterSeal NP 1.”
 - b. Sika Corporation, Construction Products Division; “Sikaflex-1a.”
- B. Multicomponent, Nonsag, Urethane Joint Sealant: ASTM C920, Type M, Grade NS, Class 25, for Use NT, M, A and O.
 - 1. Products: The following, or equal:
 - a. BASF Master Builders Solutions; “MasterSeal NP 2.”
 - b. Sika Corporation, Construction Products Division; “Sikaflex-2c NS.”
- C. Multicomponent Urethane Joint Sealant: ASTM C920; self-leveling, Type M, Grade P, Class 25, Uses T, M, A, O, and approved by manufacturer for wide joints up to 1-1/2 inches.
 - 1. Products: The following or equal:
 - a. BASF Master Builders Solutions; “MasterSeal SL 2.”
 - b. Sika Corporation, Construction Products Division; “Sikaflex 2c SL.”

2.5 BUTYL JOINT SEALANTS

- A. Butyl-Rubber-Based Joint Sealants: ASTM C1311 and FS TT-S-001657, Type I.
 - 1. Products: The following, or equal:
 - a. Bostik, Inc.; “Chem-Calk 300.”
 - b. Pecora Corporation; “BC-158.”

2.6 ACRYLIC LATEX JOINT SEALANTS

- A. Latex Joint Sealant: Acrylic latex or siliconized acrylic latex, nonsag, paintable, nonstaining. ASTM C 834, Type OP, Grade NF.
 - 1. Products: The following, or equal:
 - a. Pecora Corporation; “AC-20.”
 - b. Sherwin Williams; 950A.

2.7 ACOUSTICAL JOINT SEALANTS

- A. Acoustical Sealant; ASTM C834, nonsag, paintable, nonstaining latex sealant. Effectively reduce airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E90.

JOINT SEALANTS
SECTION 07 9200
3595001

1. Products: The following, or equal:
 - a. Pecora Corporation; "AC-20" or "AC-20 FTR" (Fire and Temperature Rated).
 - b. United States Gypsum Company: USG "Sheetrock Acoustical Sealant,"

2.8 JOINT SEALANT BACKING

- A. General: Provide sealant backings of material and type that are nonstaining; are compatible with joint substrates, sealants, primers and other joint fillers; and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.
- B. Cylindrical Sealant Backer Rods: Compressible, non-gassing rod-stock complying with ASTM C1330; polyethylene-jacketed polyurethane foam; butyl-rubber foam; neoprene foam; or other flexible, permanent, durable, non-absorptive closed-cell (Type C), open cell (Type O), or bi-cellular material (Type B) and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.
 1. Open cell rods shall not be used at sealant joints for horizontal surfaces.
 2. Closed cell rods shall not be used at double sealant joints.
- C. Bond-Breaker Tape: Polyethylene tape or other plastic tape as recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint filler materials or joint surfaces at back of joint where such adhesion would result in sealant failure. Provide self-adhesive tape where applicable.

2.9 SEALANT ACCESSORIES AND ADDITIONAL MATERIALS

- A. Primer: Material recommended by joint sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint sealant-substrate tests **[and field tests]**.
- B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming in any way joint substrates and adjacent nonporous surfaces, and formulated to promote optimum adhesion of sealants with joint substrates.
- C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.
- D. Spall Repair Mortar: Two-component structural epoxy binder and sand aggregate, producing a mortar that is easily worked and troweled. Early-set system designed specifically for the repair of industrial concrete floors subject to hard wheeled traffic. Compatible with joint filler and recommended by the joint filler manufacturer in writing.
 1. Products: The following, or equal:
 - a. Metzger/McGuire: "Armor-Hard."

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting joint sealant performance. Do not proceed with installation of joint sealants until unsatisfactory conditions have been corrected.
- B. Commencement of work indicates acceptance of substrates.

3.2 PREPARATION

- A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with recommendations of joint sealant manufacturer and the following requirements:
 - 1. Remove foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.
 - 2. Clean concrete, masonry, unglazed surfaces of ceramic tile, and similar porous joint substrate surfaces by brushing, grinding, blast cleaning, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining from above cleaning operations by vacuuming or blowing out joints with oil-free compressed air.
 - 3. Remove laitance and form release agents from concrete.
 - 4. Clean metal, glass, porcelain enamel, glazed surfaces of ceramic tile, and other nonporous surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants.
- B. Spall Repair: Repair spalled joints in concrete slabs to produce joints of profiles recommended by joint sealer manufacturers.
- C. Joint Priming:
 - 1. Prime joint substrates where indicated or where recommended by joint sealant manufacturer based on preconstruction joint sealant-substrate tests or prior experience.
 - 2. Apply primer to comply with joint sealant manufacturer's recommendations. Confine primers to areas of joint sealant bond; do not allow spillage or migration onto adjoining surfaces.
- D. Masking Tape:
 - 1. Use masking tape where required to prevent contact of sealant with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears.

JOINT SEALANTS
SECTION 07 9200
3595001

2. Remove tape immediately after tooling without disturbing joint seal.
- E. Remove sealant and prepare joints in existing exterior locations as directed by representative of sealant manufacturer specified in this work.

3.3 INSTALLATION OF JOINT SEALANTS

- A. General:
 1. Comply with joint sealant manufacturer's printed installation instructions applicable to products and applications indicated, except where more stringent requirements apply.
 2. Seal around penetrations, holes, gaps, surface mounted fixtures and pipes entering building including light fixtures, mounting brackets and other similar items.
- B. Sealant Installation Standard: Comply with recommendations of ASTM C1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.
- C. Joint Sealants at Building Exterior and Interior:
 1. Seal the following joints with joint sealant:
 - a. Expansion and control joints in exterior walls, copings, parapets.
 - b. Joints between metal panels.
 - c. Joints between door and window frames and adjacent materials.
 - d. Joints between cabinets and countertops and walls.
 - e. Control joints in interior partitions, including portion above ceilings.
 - f. Expansion and control joints in solid exterior soffits.
 - g. Control joints in interior ceilings and soffits.
 2. Apply continuous bead of joint sealant in the following locations during installation of materials specified elsewhere:
 - a. In lap joints of sheet metal construction.
 - b. Roofing panels and roof-related sheet metal and flashing.
 - c. Between partition floor and ceiling tracks and adjacent construction.
 - d. Between end stud of partition and adjacent construction.
 - e. Under door sills and thresholds.
 - 1) Set sills and thresholds in continuous double bead of sealant.
 - 2) Provide sealant at butt ends of thresholds against door frame, around door frame and between threshold and resilient floor covering.
 3. Apply acoustic sealant at acoustic separations to make assembly airtight.
 - a. Seal perimeter and intersections of finish.
 - b. Seal around electrical boxes and other penetrations of finish; seal holes within electrical boxes; seal conduit ends.
 - c. Seal pipes which penetrate acoustic separations.
 4. Apply joint sealant at joints not specifically mentioned above which require sealant to meet the performance criteria cited in this Section.

- D. Installation of Sealant Backer Rods: Install sealant backer rods to comply with the following requirements:
1. Install joint fillers of type indicated to provide support of sealants during application and at position required to produce the cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
 - a. Do not leave gaps between ends of joint fillers.
 - b. Do not stretch, twist, puncture, or tear joint fillers.
 - c. Remove absorbent joint fillers that have become wet prior to sealant application and replace with dry material.
 2. Install bond breaker tape between sealants where backer rods are not used between sealants and joint fillers or back of joints.
- E. Sealant Installation:
1. Install sealants by proven techniques that result in sealants directly contacting and fully wetting joint substrates, completely filling recesses provided for each joint configuration, and providing uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.
 2. Install sealants at the same time sealant backings are installed.
- F. Tooling of Nonsag Sealants:
1. Immediately after sealant application and prior to time skinning or curing begins, tool sealants to form smooth, uniform beads of configuration indicated, to eliminate air pockets, and to ensure contact and adhesion of sealant with sides of joint. Remove excess sealants from surfaces adjacent to joint.
 2. Do not use tooling agents that discolor sealants or adjacent surfaces or are not approved by sealant manufacturer.
 3. Profiles:
 - a. Provide concave joint configuration in accordance with Figure 8A in ASTM C1193, unless otherwise indicated.
 - b. Provide flush joint configuration in accordance with Figure 8B in ASTM C1193, where indicated.
 - c. Provide recessed joint configuration in accordance with Figure 8C in ASTM C1193, of recess depth and at locations indicated.
 - 1) Use masking tape to protect adjacent surfaces of recessed tooled joints.
- G. Joint Fillers in Refrigerated Rooms:
1. Apply joint filler only after rooms have been brought down to the final temperature for five calendar days.
 2. Provide supplemental heat and dual dispensing system as required to apply in strict accordance with the manufacturer's directions.

JOINT SEALANTS

SECTION 07 9200

3595001

3.4 DEFECTIVE WORK

- A. Repair damaged and defective work and eliminate functional and visual defects. Where repair is not possible replace work. Adjust joints for uniform appearance.
- B. Cut out and remove damaged or deteriorated joint sealants immediately so that and installations with repaired areas are indistinguishable from original work.

3.5 CLEANING AND PROTECTION

- A. Clean off excess sealants or sealant smears adjacent to joints as work progresses by methods and with cleaning materials approved by manufacturers of joint sealants and of products in which joints occur.
- B. Clean excess adhesive from exposed surfaces of neoprene compression seal with solvent cleaner as recommended by manufacturer.
- C. Protect joint sealants during and after curing period from contact with contaminating substances or from damage resulting from construction operations or other causes so that they are without deterioration or damage at time of Substantial Completion.

3.6 SEALANT SCHEDULE

- A. General:
 - 1. Joints in construction between interior and exterior spaces and other designated or required locations to provide effective barrier against passage of elements:
 - a. Multicomponent, Nonsag, Urethane Joint Sealant: ASTM C920, Type M, Grade NS, Class 25, for Use NT, M, A and O.
 - b. Single-Component, Nonsag, Urethane Joint Sealant: ASTM C920, Type S, Grade NS, Class 25, for Use NT.
 - 2. Specialty perimeters where required for appearance or weather tightness:
 - a. Multicomponent, Nonsag, Urethane Joint Sealant: ASTM C920, Type M, Grade NS, Class 25, for Use NT, M, A and O; capable of 50 percent extension and compression movement.
 - b. Single-Component, Nonsag, Urethane Joint Sealant: ASTM C920, Type S, Grade NS, Class 35, for Use NT.
 - c. Single-Component, Nonsag, Neutral-Curing Silicone Joint Sealant: ASTM C920, Type S, Grade NS, Class 50, for Use NT.
 - d. Single-Component, Nonsag, Neutral-Curing Silicone Joint Sealant: ASTM C920, Type S, Grade NS, Class 100 / 50, for Use NT.
- B. Exterior Locations:
 - 1. Joints Bordered by Glass: Single-component, nonsag, neutral-curing silicone joint sealant, ASTM C920, Type S, Grade NS, Class 50, for Use NT.
 - 2. Joints Bordered by Plastic: Single-component, nonsag, neutral-curing silicone joint sealant, ASTM C920, Type S, Grade NS, Class 100 / 50, for Use NT.

3. Horizontal Joints in Exterior Walks Abutting Building Walls, Interior Concrete Floors: Multicomponent urethane sealant, self-leveling; ASTM C920, Grade P, Class 25, Uses T, M and A.
 - a. Where walks abut structural slabs or stoops.
 - b. Where walks abut exterior wall of buildings.
 - c. Where exposed interior concrete slabs abut vertical surfaces.
 - d. Where sealant is shown on the Drawings for concrete slabs.
4. Sheet Metal and Roof Accessory Sealants: Types recommended by roofing manufacturer and complying with requirements of this Section.
5. Exterior Sheet Metal Lap Joints: Types recommended by manufacturer and complying with requirements of this Section.
6. Joints Between Concrete Panels, and Between Concrete Panels and Other Work: Single-component, nonsag, neutral-curing silicone joint sealant, ASTM C920, Type S, Grade NS, Class 100 / 50, for Use NT and formulated to reduce or eliminate dirt pickup, surface streaking, and substrate staining.
7. Exterior Metal Panel Butt Joints and Trim: Types recommended by manufacturer and complying with requirements of this Section.
8. Sills and Thresholds: Butyl-rubber-based joint sealants, ASTM C1311.
9. All Other Exterior Joints:
 - a. Single-component, nonsag, neutral-curing silicone joint sealant, ASTM C920, Type S, Grade NS, Class 100 / 50, for Use NT.
 - b. Single-component, nonsag, neutral-curing silicone joint sealant, ASTM C920, Type S, Grade NS, Class 50, for Use NT.
 - c. Around perimeters of frames where door, window and louver frames abut concrete, masonry or other building materials.
 - d. Expansion and control joints in masonry.
 - e. Masonry at dissimilar material or at dissimilar masonry.
 - f. Miscellaneous locations where sealant is shown on Drawings.

C. Interior Locations:

1. Expansion and Control Joints:
 - a. Multicomponent, Nonsag, Urethane Joint Sealant: ASTM C920, Type M, Grade NS, Class 25, for Use NT, M, A and O.
 - b. Single-Component, Nonsag, Urethane Joint Sealant: ASTM C920, Type S, Grade NS, Class 35, for Use NT.
 - c. Around perimeters of frames where door, window and louver frames abut concrete, masonry or other building materials.
 - d. Expansion and control joints in masonry walls.
 - e. Masonry at dissimilar material or at dissimilar masonry.
 - f. At miscellaneous locations where sealant is shown on Drawings.
2. Sills and Thresholds: Butyl-Rubber-based joint sealants, ASTM C1311.

JOINT SEALANTS

SECTION 07 9200

3595001

3. Interior Wet Areas, Around Plumbing Fixtures, Countertops Abutting Walls, Food Service Applications: Mildew-resistant, single-component, acid-curing silicone joint sealant, ASTM C920, Type S, Grade NS, Class 25, for Use NT, A and O.
4. Interior Static Dry Joints as Required to Dress Appearance: Acrylic latex or siliconized acrylic latex joint sealant, ASTM C 834, Type OP, Grade NF
5. Sound Control Applications: Acoustical Sealant, ASTM C 834
 - a. Where Required for Sound Control with Limited Flame Spread: Acoustical sealant, ASTM C 834, fire-rated type.

END OF SECTION

*P:\Sacramento\3595 Tracy Unified School District\001-000_Villalovoz ES New Shade Structures\08 Specifications\06 SPEC\04
FINAL\Jacobson\07 9200_Joint Sealants.docx
Last Updated: March 24, 2021*

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Painting and painter's finish on all exposed exterior and interior surfaces, except prefinished items and unless otherwise noted, as required to complete finishing of the Work. The Work includes, but is not necessarily limited to, the following specific items:
1. Paint, stain or otherwise finish all new surfaces.
 2. Back priming of concealed surfaces, except as otherwise specified.
 3. Paint, repaint or finish of existing painted surfaces altered, defaced or damaged as a result of work of this Contract.
 4. Paint site items which are not prefinished, including posts, screens, panels, bollards, supports, rails and other similar improvements.
 5. Mechanical and plumbing vents on roof.
 6. Unpainted or unfinished exposed building components, pipes and conduit, including sprinkler piping, and metal ductwork, which run exposed across finished or painted surfaces.
 7. Painting work in rooms where finishing work is performed, including painting new surfaces as specified and re-painting existing surfaces within the room, unless otherwise indicated. Re-painting existing surfaces shall be with minimum of one coat using specified coatings compatible with existing.
- B. Surface treatment, priming and coats of paint specified in this Section are in addition to shop priming and surface treatment specified under other Sections unless otherwise noted.
- C. Items Not Included in This Section:
1. Factory and shop-prefinished items as specified in various Sections.
 2. Painting specified elsewhere and included in respective Sections, including but not necessarily limited to shop priming.

1.2 WORK NOT TO BE PAINTED UNLESS OTHERWISE INDICATED

- A. Exposed exterior concrete and concrete slab surfaces, except as noted.
- B. Suspended acoustical ceilings and acoustical tile, except as noted.
- C. Pre-finished casework and other factory and shop-prefinished items as specified in various Sections.
- D. Finish hardware except prime coated items.
- E. Items typically not to be painted including, but not limited to, the following:
1. Glass.

PAINTING
SECTION 09 9100
3595001

2. Ceramic tile.
 3. Membrane roofing.
 4. Safety nosings.
 5. Resilient floor covering and base.
 6. Carpet.
 7. Pre-finished paneling.
 8. Plastic laminate.
 9. Porcelain enamel.
 10. Vinyl wallcovering, except where noted.
- F. Aluminum doors, windows, frames and railings.
- G. Metal or plastic toilet partitions.
- H. Items of chromium, copper, nickel, brass, bronze or stainless steel.
- I. Surfaces in concealed areas such as furred spaces.
- J. Tops of gravel stop flanges (including priming) where roofing material will be adhered to.
- K. Wall areas concealed by cases, counters, cabinets, chalkboards, tackboards (prime coat only required).
- L. Piping or conduit including brackets and similar items therewith running on or across unpainted or otherwise unfinished walls or ceilings.
- M. Galvanized gratings, recessed foot grilles, and thresholds.
- N. Structural steel scheduled to receive fireproofing.

1.3 RELATED REQUIREMENTS

- A. Section 01 6116, Volatile Organic Compound (VOC) Restrictions; for VOC limits pertaining to adhesives, sealants, fillers, primers, and coatings.
- B. Section 01 8113, Sustainable Design Requirements, for CAL-Green general requirements and procedures.
- C. Section 07 6200, Sheet Metal Flashing and Trim.
- D. Section 07 9200, Joint Sealants.
- E. Section 09 2900, Gypsum Board.
- F. Divisions 22, 23 and 26, Exposed piping, ductwork and conduit.

1.4 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).

- B. California Green Building Standards Code (CAL Green), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- C. ASTM International (ASTM):
 - 1. D523: Standard Test Method for Specular Gloss.
 - 2. D4263: Standard Test Method for Indicating Moisture in Concrete by the Plastic Sheet Method.
 - 3. D6386: Standard Practice for Preparation of Zinc (Hot-Dip Galvanized) Coated Iron and Steel Product and Hardware Surfaces for Painting.
 - 4. D7396: Standard Guide for Preparation of New, Continuous Zinc-Coated (Galvanized) Steel Surfaces for Painting.
- D. Master Painters Institute (MPI):
 - 1. Architectural Painting Manual Guide Specification.
- E. The Association for Materials Protection and Performance (AMPP):
 - 1. SSPC-Society for Protective Coatings/ National Association of Corrosion Engineers International (NACE):
 - a. SSPC-SP 1: Solvent Cleaning.
 - b. SSPC SP-10/NACE No. 2: Near-White Metal Blast Cleaning.
 - c. SSPC-SP 16: Brush-Off Blast Cleaning of Coated and Uncoated Galvanized Steel, Stainless Steels, and Non-Ferrous Metals.

1.5 ADMINISTRATIVE REQUIREMENTS

- A. Submittal Procedures:
 - 1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
 - 2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
 - 3. Sustainable Design Submittals shall comply with the additional requirement of Section 01 8113, Sustainable Design Requirements.

1.6 ACTION SUBMITTALS

- A. Product Data: Submit list and complete descriptive data of products proposed for use. Include manufacturer's specifications, published warranty or guarantee, and application instructions. Cross-reference to paint system and locations of application areas.
- B. Samples:
 - 1. Appropriately label and identify each sample, including location and application. Include **[Architect's number as scheduled on the Drawings,]** manufacturer's name, color number, and gloss units.
 - 2. Prepare on 8 inch x 10 inch card stock for selected colors and finishes.

PAINTING
SECTION 09 9100
3595001

3. Submit sufficiently ahead of work progress to allow for color board assembly and distribution.
4. Resubmit as requested until required sheen, color, and texture are approved.

1.7 INFORMATIONAL SUBMITTALS

- A. Statement of applicator qualifications.
- B. Sustainable Design:
 1. General:
 - a. Submit information necessary to establish and document compliance with the California Green Building Standards Code.
 - b. Sustainable design submittals are in addition to other submittals.
 2. The following information shall be provided:
 - a. Paints and Coatings: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.

1.8 CLOSEOUT SUBMITTALS

- A. Guarantee: Submit Subcontractor's guarantee.

1.9 MAINTENANCE MATERIAL SUBMITTALS

- A. At completion of the Work, deliver to Owner extra stock of paint of each color used in each coating material used.
- B. Containers shall be full, tightly sealed, and clearly marked.
- C. Provide the following quantities:
 1. Field Colors: 1 five-gallon container.
 2. Accent Colors: 1 one-gallon container.

1.10 QUALITY ASSURANCE

- A. Use only new materials and products.
- B. Single-Source Responsibility:
 1. To the maximum extent practicable, select a single manufacturer to provide all materials required by this Section, using additional manufacturers to provide systems not offered by the selected principal manufacturer.
 2. For each individual system:
 - a. Provide primer and other undercoat paint produced by same manufacturer as finish coat.
 - b. Use thinner within manufacturer's recommended limits.
- C. Source Quality Control: Material shall be best grade products of type specified and listed below as regularly manufactured by these manufacturers. Materials not bearing

manufacturer's identification as standard "best grade product" of their regular line will not be considered for use.

- D. Materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.
- E. Materials and application procedures shall comply with local, state and federal air pollution control regulations.
- F. Manufacturer's representative from coating supplier shall visit the site prior to application to review and approve the specified systems. Discrepancies or recommended changes shall be submitted to the Architect for consideration prior to finalization of submittal.
- G. Site Application Mockup:
 - 1. Prior to ordering materials and unless waived by the Architect in writing, the Contractor shall provide large scale mockup areas for all colors, both interior and exterior, directly applied to the building for final color approval by the Architect.
 - 2. Minimum Size:
 - a. Ceiling Areas: Finish a panel 10 feet square.
 - b. Wall Areas: Finish a panel 8 feet long by full height of wall.
 - c. Finish a portion of other items as directed by Architect.
 - 3. Provide up to 2 adjustments at no extra cost to the Owner.
 - 4. Paint shall not be ordered or applied until such large scale sample(s) have been reviewed and approved by the Architect in writing. These requirements as described herein may be waived by the Architect in writing only.

1.11 DELIVERY, STORAGE AND HANDLING

- A. Deliver undamaged products to job in manufacturer's sealed containers and/or original bundles with tags and labels intact.
- B. Store materials in protected, clean, dry conditions off of ground and in areas which will not interfere with the progress of the Work.
- C. Transport, store and handle in strict accordance with the manufacturer's written recommendations and as specified below.
- D. Remove paint-soiled rags and waste from premises at end of each day's work or store in metal containers with metal covers.
- E. Paint stored at site, shall be in separate structure not less than 60 feet from any other building or structure. Remove empty containers and soiled rags as they accumulate. At completion, remove structure, cleanup area, and leave in original condition.

PAINTING
SECTION 09 9100
3595001

1.12 FIELD CONDITIONS

- A. Do not apply paints and coatings under conditions which jeopardize quality or appearance of painting or finishing.
- B. Cover or otherwise protect finished work of other trades and surfaces not being painted concurrently or not to be painted.
- C. Exterior:
 - 1. Comply with manufacturer's recommendations as to environmental conditions under which coatings and coating systems can be stored and applied.
 - 2. Do not apply exterior paint when air or surface temperature is under 50 degrees F or when air or surface temperature will be below 50 degrees F for 48 hours after painting.
 - 3. Do not apply immediately following snow, rain, dew or during foggy weather.
 - 4. Do not apply when temperature is over 85 degrees F except in protected or shaded areas.
- D. Interior:
 - 1. Do not apply interior paint when air or surface temperature is below 50 degrees F unless temperature is maintained constantly.
 - 2. Do not apply when ventilation is inadequate to maintain humidity lower than dew point of coldest wall.
- E. Use moisture meter for determining proper moisture levels of surfaces for painting.
- F. Report to Architect in writing upon discovery of any prime coat painting specified in other Sections of Specifications that would prevent proper application of specified finish.
- G. Furnish, erect and remove scaffolding and planks required for work under this Section. Conform to state and local codes, rules and regulations.

1.13 EXISTING CONDITIONS

- A. Existing Surfaces:
 - 1. Paint or otherwise finish all existing surfaces as indicated or scheduled on the Drawings.
 - 2. Work includes primer, paint, repaint or finish of existing painted surfaces altered, defaced or damaged as a result of work under this Contract.
- B. Existing surfaces to be painted include:
 - 1. Exterior wall surfaces, including fascia, trim.
 - 2. Soffits and exterior ceilings including exposed roof framing.
 - 3. Doors and frames, both wood and metal.
 - 4. Window frames, trim and solid infill panels except unpainted or prefinished aluminum.

5. Exposed conduit, piping, brackets, supports, and similar metal fabrications.
6. Downspouts and gutters.
7. Parapet caps and exposed flashings.
8. Mechanical well walls, all surfaces.
9. Concrete foundation where exposed below painted wall surfaces.
10. Roll-up doors and frames.
11. Closure panels between relocatable buildings.
12. Enclosure walls, screen walls, equipment yards.
13. Other work as shown on the Drawings, specified, or as required for a complete Project.

1.14 GUARANTEE

- A. Contractor: Under conditions of its Guarantee under the Contract, paint colors shall be substantially unchanged and finishes shall maintain their original adherence without showing blisters, flaking, peeling, scaling, staining or unusual deterioration or other defects.

PART 2 - PRODUCTS

2.1 DESIGN AND PERFORMANCE CRITERIA

- A. Sustainable Design:
 1. VOC emissions for field-applied paints and coatings must comply with limits specified in Section 01 6116.

2.2 MANUFACTURERS AND COATING PRODUCTS

- A. Products are specified under "Paint Systems" in Part 3 below and are manufactured by Kelly-Moore, except as otherwise indicated. Equivalent products to those scheduled manufactured by Sherwin-Williams, PPG Architectural Finishes, Glidden Professional, Benjamin Moore & Co., Dunn-Edwards, Vista, or equal, are acceptable.
- B. Materials selected for coating systems for each type surface shall be the product of a single manufacturer or shall be acceptable to manufacturer of finish coating for system.
- C. If more than one quality level of product type is marketed, use material of highest quality.

2.3 MIXING AND TINTING

- A. Deliver paints and stains ready mixed to jobsite. On-site color mixing or tinting will not be allowed.
- B. Each kind of coating for paint finishes shall be factory-mixed to match approved samples, colors, and ready for immediate application.
- C. Mix proprietary products in strict accordance with manufacturer's printed directions.

PAINTING
SECTION 09 9100
3595001

- D. Thinning, if permitted by manufacturer for a specific coating, shall be in accordance with manufacturer's instructions. Thinning of other products shall be in accordance with standard practice.

2.4 COLORS

- A. Colors shall be as scheduled on the Drawings.
- B. Architect will prepare a color schedule with samples for guidance of painter and reserves right to select, allocate, and vary colors on different surfaces throughout building.
 - 1. Colors selected by Architect may be from manufacturer's full range standard palette or be custom mixed.
 - 2. Unless otherwise indicated on the Drawings, different colors will be selected for different materials such as walls, trim, and doors.
- C. Colors to be selected by the Architect, or where scheduled on the Drawings, are solely for the purpose of conveying color information and do not imply manufacturer's approval or waiver of the requirement that all coatings be from the same manufacturer, unless a specific system is not available from the primary manufacturer.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Prior to the work of this Section, carefully inspect and verify that the installed work of all other trades is complete to the point where this work may properly commence.
- B. Verify that painting may be performed in accordance with the approved design.
- C. In the event of discrepancy, immediately notify Architect. Do not proceed in discrepant areas until discrepancies have been fully resolved.

3.2 PREPARATION

- A. General:
 - 1. Surface preparation and product application shall be in accordance with manufacturer's printed instructions.
 - 2. In addition to prime coats indicated (primer, sealer, filler, undercoat), use two finish coats minimum, and additional coats as required for complete coverage and good appearance of scheduled finish coat.
 - 3. Surfaces to receive new finish shall be properly prepared prior to application of finish coatings.
 - 4. Do not apply paint, enamel, stains or varnishes to wet, damp, dusty, finger-marked, rough, unfinished, or defective surfaces until such defects have been corrected.
- B. Wood - Interior:

1. Thoroughly sandpaper and dust off woodwork; putty nail holes, cracks, and other defects after first coat to match color of paint. Putty where finish will be clear.
2. First coat on wood surfaces shall be sanded smooth. Other coats, except finish coat, shall be lightly sanded and dusted before and between each coat.
3. Smoothing, rubbing and sand-papering shall be sufficient to insure good results. Sand down all raised grain or rough surfaces and re-coat. Knots, pitch pockets and sappy portion of wood, all nail holes, cuts, cracks and other defects in wood shall have any necessary extra treatment to provide proper paint base.

C. Wood – Exterior:

1. Surfaces shall be dry and free of grease and splatters.
2. Rough surfaces shall be sanded smooth. **[Do not sandpaper resawn surfaces.]**
3. At opaque finish, fill nail holes, cracks, open joints, and other defects with filler after priming coat has dried. Exposed nail heads shall be spot primed.
4. Avoid painting surfaces while exposed directly to hot sun.
5. Smooth surfaces shall be sanded thoroughly to allow proper penetration and adhesion. Areas exhibiting tannic acid staining shall receive two coats of primer waiting 24 hours between coats. Sand and prime as soon as possible after installation to avoid UV degradation of unpainted wood surface.
6. Mildew, if present, shall be removed by scrubbing with a commercial mildew wash in accordance with manufacturer's directions.

D. Metals-General:

1. On metal work, only such sanding will be required as is necessary to provide for complete bonding of coats.
2. Steel and ironwork shall be scraped clean of scale, and rust and any grease shall be entirely removed.
3. Touch-up scratched and damaged places on metal priming coats.
4. Galvanized or zinc-coated metal shall be given an approved acid treatment 48 hours before paint is applied.
5. Prep and prime coat factory or shop primed metal products, including metal doors and frames, exposed framing, and other exposed metal if material was not shop primed.
6. Metal surfaces receiving epoxy coatings shall have stripe coat applied at all welds, edges, joints, etc., with epoxy primer prior to application of primer.

E. Metals–Galvanized Surfaces:

1. Surfaces shall be cleaned, and profiled where specified, prior to receiving applied coatings in accordance with ASTM D6386 or ASTM D7396 for sheet products.
 - a. Methods shall be selected based on age of galvanized coating, condition of surface and intended paint coating.
 - b. Care shall be taken not to damage the zinc coating.
 - c. Do not use phosphate treatment on galvanized surfaces scheduled to receive zinc-rich primers.

PAINTING
SECTION 09 9100
3595001

2. Comply with additional recommendations included in the AGA document "Duplex Systems: Painting Over Hot Dip Galvanized Steel."
3. Comply with any additional procedures required by the coating manufacturer.

3.3 REPAINTING EXISTING EXTERIOR SURFACES

A. General:

1. Exterior surfaces required to be re-painted, shall be power washed with surfactant, followed by rinsing to remove all loose coatings, chalk, dirt, efflorescence, oils, and other contaminants that would inhibit bond of new coating.
2. Mold or mildew shall be treated with bleach solution followed by thorough rinsing.
3. Protect openings into interior spaces during power washing including louvers, vents, vent screeds, grilles, to prevent water from entering interior areas including, attics and soffits.

B. Ferrous Metal: Steel framing, metal doors and frames, louvers, metal ductwork, and similar Items:

1. Remove all flaking, peeling and poorly bonded coatings, including rust from metal surfaces using power tool sanders or equivalent equipment. Feather edge remaining coatings.
2. Solvent scrub with MEK, all exposed bare metal, shop applied pretreatment and chalked coatings.
3. Spot prime exposed bare metal and metal pre-treatment prior to application of specified prime coat.

C. Galvanized Metal: Down spouts, wall caps, and Other Exposed Galvanized Metal.

1. Remove all loose, flaking or peeling coatings by scraping, chipping or sanding. Feather all rough edges by sanding.
2. Apply phosphoric acid etch pre-treatment to exposed galvanized metal.

D. Plaster:

1. Remove loose coatings using hand or power tools.
2. Patch plaster areas where original material has cracked, spalled or otherwise been removed with compatible material. Fill areas completely to provide smooth, even surface for refinishing. Spot prime patches prior to proceeding.
3. Patch masonry joints with cracks or missing material with compatible materials.

E. Wood Siding and Trim:

1. Remove loose, flaking or peeling coatings by scraping, chipping or sanding. Feather rough edges by sanding.
2. Surfaces that exhibit moderate to heavy chalk deposits shall be thoroughly cleaned to sound substrate by wire brushing, sanding, or power washing.
3. Spot prime bare wood, exposed nail and fastener heads prior to application of specified prime coat.

4. Glossy surfaces shall be dulled by sanding. Crystalline deposits shall be removed by flushing with water from a hose.
5. Mildew, if present, shall be removed by scrubbing with a commercial mildew wash in accordance with manufacturer's directions.

3.4 CAULKING

- A. Caulk all cracks in finished surfaces.
- B. Seal around any wall openings where original sealant is not fully sealing.
- C. Provide sealant at material transitions and intersections as required.

3.5 PROTECTION

- A. Hardware, fixture canopies, outlet covers, switch plates and other such items shall be removed or loosened and replaced after completing work as required for painting and finishing. Protect items until reinstalled.
- B. Protect work and work of others during progress against damage. Leave such work clean and whole. Correct damage by cleaning, repairing, replacing or repainting as directed.
- C. Provide necessary drop cloths for protection of work. Cover finished surfaces adjacent to work.

3.6 APPLICATION

- A. General:
 1. Do not apply initial coating until moisture content of surface is within limitations recommended by paint manufacturer.
 2. Apply coatings in accordance with manufacturer's recommendations and the additional requirements, as applicable, of the Architectural Painting Manual Guide Specifications for application methods and paint systems.
 3. Flow coat on evenly and well brushed in. Should dead spots occur, touch-up before next coat is applied. Should spots or cracks burn through after final coat is applied, apply additional coats to entire surface as necessary to remedy defects.
 4. Rate of application shall be within limits recommended by paint manufacturer for surface involved.
- B. Thicknesses: Rate of application shall be within limits recommended by paint manufacturer for surface involved and comply with the following.
 1. Paint materials shall be applied in manner to average 1.5 to 3 Dry Mills in thickness for the total number of coats scheduled.
 2. Provide Tooke Dry Mill Coating Inspection Gauge manufactured by Micro Metrics Company to the Project Inspector for inspection of finished coating systems, if requested.

PAINTING
SECTION 09 9100
3595001

- C. Refinish whole area where portion of finish is not acceptable.
- D. Adjust natural finishes as necessary to obtain identical appearance on veneers and solid stock.
- E. Equipment adjacent to walls shall be disconnected, using workers skilled in appropriate trades, and moved to permit wall surfaces to be painted. Following completion of painting, they shall be expertly replaced and reconnected.
- F. Top and bottom edges of all doors shall receive same paint system finish required for door faces.
- G. Do not paint over fire-rating labels, fusible links, or sprinkler heads.

3.7 DEFECTIVE WORK

- A. Painter shall be responsible for damage or unsuitable work, including that caused by improperly prepared surfaces. Refinishing shall be at no cost to the Owner. Repair work damaged during construction; touch-up or refinish as necessary any abraded, stained or otherwise damaged surfaces.

3.8 CLEANING AND PROTECTION

- A. Thoroughly clean any drips, splatters, spills, splashes, etc., from walls, floor or other surfaces, with no damage to those surfaces.
- B. Protect work and materials of this Section prior to and during installation, and protect the installed work and materials of other trades.
- C. In the event of damage, make all repairs and replacements necessary to the approval of the Architect at no additional cost to the Owner.

3.9 PAINT SYSTEMS

- A. General:
 - 1. Only major areas are scheduled, but miscellaneous and similar items and areas within room or space shall be treated with suitable system.
 - 2. This Specification shall serve as guide and is meant to establish procedure and quality. Confer with the Architect to determine exact finish desired.
 - 3. Number of coats scheduled is minimum. Additional coats shall be applied at no additional cost as required to hide base material completely, produce uniform color, and provide required and satisfactory finish.
- B. Gloss and Sheen Ratings: Paint gloss shall be defined as the sheen rating of applied paint, in accordance with the following limits in conformance with Master Painters Institute, Inc. (MPI) Standards according to ASTM D523. Not all of the Gloss Levels are necessarily scheduled or used on this Project.

Gloss Level	Description	Units @ 60 degrees	Units @ 85 degrees
G1	Matte or Flat finish	0 to 5	10 max.
G2	Velvet finish	0 to 10	10 to 35
G3	Eggshell finish	10 to 25	10 to 35
G4	Satin finish	20 to 35	35 min.
G5	Semi-Gloss finish	35 to 70	
G6	Gloss finish	70 to 85	
G7	High-Gloss finish	> 85	

C. Clarification of System Terminology:

1. Interior paint Systems are specified and identified herein by initial letters "INT."
2. Exterior paint Systems are specified and identified herein by initial letters "EXT."
3. The numbers following "INT" and "EXT" for each System identifies the substrate to be coated.
4. Initial numbers for each System identify the substrate to be coated summarized as follows with further clarification included with the System description:

CODE	DESCRIPTION
3.1	Concrete
3.2	Cement Plaster
4	Masonry
5	Metal
6	Wood
9.2	Gypsum Board
9.3	Acoustical Panels and Tile

5. The letter following substrate number identifies the general finish coat chemistry summarized as follows:

CODE	DESCRIPTION
A	Standard acrylic
B	Non-bridging vinyl acrylic
C	Epoxy-like acrylic
D	Semi-transparent stain
E	Elastomeric
F	High performance epoxy-like acrylic
G	Lacquer
H	Aliphatic urethane
I	Fire Retardant Intumescent
J	Acrylic Urethane
K	PVA primer
L	Acrylic primer
M	Premium performance acrylic polymer

6. Hyphenated suffix identifies the topcoat gloss level.

PAINTING
SECTION 09 9100
3595001

3.10 INTERIOR PAINTING SYSTEMS

INT 5.1A-5

Acrylic on Exposed Steel, Not Shop Primed - Gloss Level 5

1 coat	5725 DTM	Acrylic Primer
2 coats	1050 Premium Professional	Latex Semi-Gloss

Note: Modify scheduled finish coat if lower gloss level is selected by Architect.

INT 5.2A-5

Acrylic on Shop Primed Metal Including Hollow Metal Doors & Frames - Gloss Level 5

2 coats	1050 Premium Professional	Latex Semi-Gloss
---------	---------------------------	------------------

Note: Modify scheduled finish coat if higher or lower gloss level is selected by Architect.

INT 5.2M-6

Premium Performance Acrylic on Exposed Metal - Gloss Level 6

1 coat	Devacryl 1440	Waterborne Acrylic
2 coats	Devacryl 1449	100% Acrylic-Gloss

INT 9.2A-1

Acrylic on Gypsum Board - Gloss Level 1; at theater stage

1 coat	971 AcryPlex	PVA Primer/Sealer
2 coats	Speedhide 6-753 by PPG Architectural Finishes	Acrylic Latex Flat Black

INT 9.2A-3

Acrylic on Gypsum Board, textured finish - Gloss Level 3

1 coat	971 AcryPlex	PVA Primer/Sealer
2 coats	1010 Premium Professional	Latex Eggshell

INT 9.2A-5

Acrylic on Gypsum Board, smooth finish - Gloss Level 5

1 coat	971 AcryPlex	PVA Primer/Sealer
2 coats	1050 Premium Professional	Latex Semi-Gloss

Note: Provide additional topcoat at toilet rooms and food service areas.

INT 9.3B-1

Acrylic on Acoustic Panels and Tiles - Gloss Level 1

1 coat	1005 Ceiling Paint	Non-Bridging Vinyl Acrylic Flat
--------	--------------------	---------------------------------

3.11 EXTERIOR PAINTING SYSTEMS

EXT 3.2A-2

Acrylic on Cement Plaster - Gloss Level 2

1 coat	247 AcryShield	Acrylic Masonry Primer
2 coats	1210 Premium Professional	100% Acrylic Low Sheen

EXT 5.1A-5

Acrylic over Unprimed Steel - Gloss Level 5

1 coat	5725 DTM	Metal Primer
2 coats	1215 Premium Professional	100% Acrylic Semi-Gloss

EXT 5.2A-5

Acrylic over Shop Primed Metal Doors and Frames, Steel Frame, Mechanical and Electrical Equipment, and Panels - Gloss Level 5

2 coats	2888 DuraPoxy HP	Acrylic Urethane Semi-Gloss
---------	------------------	-----------------------------

EXT 5.3A-5

Premium Acrylic over Waterborne Primer on Galvanized Metal – Gloss Level 5

Pretreatment	SSPC SP-1	Heavy-duty cleaner
1 coat	5725 DTM	Acrylic Primer
2 coats	1215 Premium Professional	100% Acrylic Semi-Gloss

Note: Provide pretreatment and primer if preparation and primer not applied in shop.

EXT 5.4A-5

Acrylic over Waterborne Primer on Aluminum – Gloss Level 5

Pretreatment	Devco Devprep 88	Heavy-duty cleaner
1 coat	5725 DTM	Acrylic Primer
2 coats	1215 Premium Professional	100% Acrylic Semi-Gloss

Note: Provide pretreatment and primer if preparation and primer not applied in shop.

3.12 MISCELLANEOUS PAINTING

- A. Mechanical and Electrical Equipment, Conduits and Piping: Paint exposed items as scheduled using appropriate system for material and whether or not item has been factory-primed.
- B. Exposed Insulation-Covered Piping: Size with Arabol, or equal latex type adhesive, and apply 2 coats of semi-gloss enamel.
- C. Material Visible through Grilles, Screens, Louvers, Vents and Screens and Exposed Hardware Cloth Screening: Painted flat black to make them as unnoticeable as possible.
- D. Mechanical Equipment: Paint mechanical equipment housings where indicated on the Drawings.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Metal-framed porcelain enamel markerboards.
 - 2. Horizontal sliding markerboards.

1.2 RELATED REQUIREMENTS

- A. Section 01 6116, Volatile Organic Compound (VOC) Restrictions; for VOC limits pertaining to adhesives, sealants, fillers, primers, and coatings.
- B. Section 01 8113, Sustainable Design Requirements, for CAL-Green general requirements and procedures.
- C. Section 12 3216, Manufactured Plastic-Laminate-Clad Casework.

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CAL Green), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Submittal Procedures:
 - 1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
 - 2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Contract Closeout and Final Cleaning.
 - 3. Sustainable Design Submittals shall comply with the additional requirement of Section 01 8113, Sustainable Design Requirements.

1.5 ACTION SUBMITTALS

- A. Shop Drawings: Submit showing all parts, connections and anchorages, adjacent materials, fully dimensioned and noted. Include in-wall blocking requirements.
- B. Product Data: Manufacturer's complete descriptive data of all products proposed for use. Include manufacturer's specifications, installation instructions, and maintenance instructions.
- C. Samples: The following samples are required.
 - 1. Submit sample for each type of board and trim components to Architect for review.

MARKERBOARDS
SECTION 10 1116
3595001

2. Manufacturer's full range of colors for Architect's selection.

1.6 INFORMATIONAL SUBMITTALS

A. Sustainable Design:

1. General:
 - a. Submit information necessary to establish and document compliance with the California Green Building Standards Code.
 - b. Sustainable design submittals are in addition to other submittals.
2. The following information shall be provided:
 - a. Adhesives and Sealants: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.
 - b. Composite Wood: Evidence of compliance that products meet formaldehyde limits of current CARB Airborne Toxic Control Measure (ATCM) as specified in Section 01 6116.

B. Sample of manufacturer's warranty.

1.7 CLOSEOUT SUBMITTALS

- A. Warranty/Guarantee: Submit executed warranty and Subcontractor's guarantee.

1.8 QUALITY ASSURANCE

- A. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.
- B. Single Source Responsibility: Use materials and products of one manufacturer whenever possible.
- C. Materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.

1.9 DELIVERY, STORAGE AND HANDLING

- A. Deliver undamaged products to job in manufacturer's sealed containers and/or original bundles with tags and labels intact.
- B. Store materials in protected, dry conditions off of ground and in areas so as to not interfere with the progress of the work.
- C. Transport, store and handle in strict accord with the manufacturer's written recommendations.

1.10 WARRANTY

- A. Manufacturer: In addition to the Contractor's and Subcontractor's Guarantee, furnish Owner with the following manufacturer's fully executed written warranties against defects in materials and workmanship including against warping of sliding panel units.

1. Dry Erase Markerboards: Lifetime of the building.
2. Other Products: As available from the manufacturer.

PART 2 - PRODUCTS

2.1 DESIGN AND PERFORMANCE CRITERIA

- A. Sustainable Design:
1. VOC emissions for field-applied adhesives, sealants, and sealant primers must comply with limits specified in Section 01 6116.
 2. Composite wood products must meet current formaldehyde emission limits of CARB Airborne Toxic Control Measure (ATCM) as specified in Section 01 6116.

2.2 HORIZONTAL SLIDING MARKERBOARDS

- A. Manufacturer and Product: Top hung sliding panels and fixed back panels; "Horizontal Sliding Units" by Claridge Products and Equipment, Inc., 800-434-4610 as specified, or equal.
1. Frame: Frame and exposed metal members to be of 6063-T5 alloy, anodized satin finish, aluminum extrusions.
 2. Tray: 2-3/4 inch deep aluminum tray with end closures.
 3. Map Rail: Full length aluminum map rail with cork insert furnished with one combination hook/clip for each 24 inch of length and two flag holders.
 4. Hardware: Rolling hardware to be nylon tipped, ball bearing rollers of sufficient size and number to enable smooth and easy operation of panels.
 5. Tracks: As standard with manufacturer for number of panels at each configuration.
 6. Panel Finish: Sliding panel units and back fixed panel shall be specified markerboard.
 7. Dimensions:
 - a. Overall Size: Typical units, unless indicated otherwise, shall be 3 panels 7'-0" wide x 4'-0" high each.
 - b. Where other sizes are shown, markerboards within sliding Units shall not exceed 5'-6" in width.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Prior to installation, carefully examine and verify that the installed work of all other trades is complete to the point where this installation may properly commence.
- B. Verify that specified items may be installed in accord with the approved designs.
- C. In the event of discrepancy, immediately notify Architect. Do not proceed in discrepant areas until discrepancies have been fully resolved.

MARKERBOARDS

SECTION 10 1116

3595001

3.2 INSTALLATION – MARKERBOARDS

- A. Install items where indicated on the Drawings, in full accord with all reviewed shop drawings and the manufacturer's recommendations, anchoring components firmly in place for long life under hard use.

3.3 PROTECTION

- A. Protect work and materials of this Section prior to and during installation, and protect the installed work and materials of other trades.
- B. In the event of damage, make all repairs and replacements necessary to the approval of the Architect at no additional cost to the Owner.

END OF SECTION

*p:\sacramento\3595 tracy unified school district\001-000_villalovoz es new shade structures\08 specifications\06 spec\04
final\jacobson\10 1116_markerboards.docx
Last Updated: March 30, 2021*

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Code required signage.
 - 2. Exterior building identification and other non-code signage.

1.2 RELATED REQUIREMENTS

- A. Section 01 6116, Volatile Organic Compound (VOC) Restrictions; for VOC limits pertaining to adhesives, sealants, fillers, primers, and coatings.
- B. Section 01 8113, Sustainable Design Requirements, for CAL-Green general requirements and procedures.
- C. Division 26, Electrical.
- D. Signage requirements included on the Drawings.

1.3 REFERENCES AND STANDARDS

- A. California Building Code, edition as noted on the drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CAL Green), edition as noted on drawings, as adopted by the California Division of the State Architect (DSA).
- C. Title 19, CCR, Article 33.01(i).
- D. American National Standards Institute (ANSI):
 - 1. A-117.1: Accessible and Usable Buildings and Facilities.
- E. ASTM International (ASTM):
 - 1. A53/A53M: Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
 - 2. A153/A153M: Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Submittal Procedures:
 - 1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.

SIGNAGE
SECTION 10 1400
3595001

2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
3. Sustainable Design Submittals shall comply with the additional requirement of Section 01 8113, Sustainable Design Requirements.

B. Coordination:

1. Prior to production of shop drawings and samples, coordinate a pre-submittal conference with Architect to confirm submittal requirements, schedule, and sign review process.
2. For signs supported by or anchored to permanent construction, advise installers of anchorage devices about specific requirements for placement of anchorage devices and similar items to be used for attaching signs. Provide template for placement of sign-anchorage devices and electrical service embedded in permanent construction by other installers.

1.5 ACTION SUBMITTALS

A. Shop Drawings:

1. Scaled drawings and signage schedule for each sign indicating materials, lettering layout, and colors.
2. Large-scale drawing and details of custom logo and lettering. Include mounting details.
 - a. Include plans, elevations, and large-scale sections of typical members and other components.
 - b. Show mounting methods, grounds, mounting heights, layout, spacing, reinforcement, accessories, and installation details.
3. Font Style. 18 point graphical example of alphabet and numerical numbers 0 through 9 of signage font style, upper and lower case letters, punctuation, 18 point scale, and black text on white paper.

B. Product Data: Submit list and complete descriptive data of all products proposed for use. Include manufacturer's specifications, published warranty or guarantee, installation instructions, and maintenance instructions.

C. Samples:

1. Submit three samples of specified signage fonts to be used for visual and tactile characters including braille below the raised characters.
2. Color Verification: Provide physical sample of each available color from the manufacturer. Include color system name and serial number, code and name as applicable.
3. Control Samples. Samples shall be prepared on same base material to be used in fabrication. Submit one sample of each sign type. Signage types are indicated in Construction Document details. Interior signs shall be full size.

4. Dimensional Letters: One full-size representative samples of each dimensional letter type required, showing letter style, color, and material finish and method of attachment.
5. Symbol of Accessibility and Pictograms. Full scale sample of pictograms and symbol of accessibility to be used on sign panels and graphics.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For installer.
- B. Sustainable Design:
 1. General:
 - a. Submit information necessary to establish and document compliance with the California Green Building Standards Code.
 - b. Sustainable design submittals are in addition to other submittals.
 2. The following information shall be provided:
 - a. Adhesives and Sealants: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.
- C. Sample of manufacturer's warranty.
- D. Signage Schedule and Alphanumeric Nomenclature. As a component of shop drawings and informational submittals, verify with Architect the sign nomenclature; room names and numbers; wording of way-finding, directional and informational signage; text; and orientation of wayfinding pictorial graphics.

1.7 CLOSEOUT SUBMITTALS

- A. Warranty/Guarantee: Submit executed warranty and Subcontractor's guarantee.
- B. Maintenance data for signs and sign types including maintenance manuals.

1.8 QUALITY ASSURANCE

- A. Contractor shall assure that the vendor shall be responsible for the quality of materials and workmanship of any firm acting as the vendor's subcontractor.
- B. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.
- C. Use materials and products of one manufacturer whenever possible.
- D. Materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.
- E. The adhesion of inlaid letters and symbols will be tested. See Article WARRANTY.
- F. Mockups:

SIGNAGE
SECTION 10 1400
3595001

1. Prior to installation, provide a taping pattern for sign plaques.

1.9 DELIVERY, STORAGE AND HANDLING

- A. Deliver undamaged products to job in manufacturer's sealed containers and/or original bundles with tags and labels intact.
- B. Store materials in protected, dry conditions off of ground and in areas so as to not interfere with the progress of the work.
- C. Transport, store and handle in strict accord with the manufacturer's written recommendations.

1.10 FIELD MEASUREMENTS

- A. Make and be responsible for all field dimensions necessary for proper fitting and completion of work. Report discrepancies to Architect before proceeding.

1.11 WARRANTY

- A. Manufacturer: In addition to the Contractor's and Subcontractor's Guarantee, furnish Owner with manufacturer's available fully executed written warranty for signage against all defects in materials and workmanship, including without limitation against yellowing, cracking, crazing, and other visible and performance defects for a period of 5 years.
 1. Text, pictograms or symbols that can be removed from the sign face utilizing a sharp object or other conventional methods will be considered a manufacturing defect.

PART 2 - PRODUCTS

2.1 DESIGN AND PERFORMANCE CRITERIA

- A. Regulatory Standards:
 1. Except as otherwise specified or shown, signage shall conform to the following:
 - a. ANSI A-117.1 and the Americans with Disabilities Act (ADA).
 - b. ATBCB Design Guidelines for Signage in relation to the Americans with Disabilities Act.
 - c. California Code of Regulations, Titles 19 and 24.
 - 1) Contracted Grade 2 Braille shall be used whenever Braille symbols are specifically required. Refer to CBC Section 11B-703.3.
 - 2) All signage shall conform to 2022 CBC Section 11B-703.
 - d. Uniform Sign Code.
 2. When there is a conflict between the CBC and ADA, comply with the most stringent.
- B. Design Criteria: Refer to Chapter 11B of the California Building Code.

1. Raised Characters: Section 11B-703.2.
 - a. Depth: Section 11B-703.2.1.
 - b. Case: Section 11B-703.2.2.
 - c. Style: Section 11B-703.2.3.
 - d. Character Proportions: Section 11B703.2.4.
 - e. Character Height: Section 11B-703.2.5.
 - f. Stroke Thickness: Section 11B-703.2.6.
 - g. Character Spacing: Section 11B-703.2.7.
 - h. Line Spacing: Section 11B-703.2.8.
 - i. Installation Height and Location: Section 11B-703.4.
 2. Braille: Section 11B-703.3.
 - a. Contracted (Grade 2) Braille with rounded or domed dots shall be used wherever Braille is required.
 - 1) Braille dimensions in accordance with Table 11B-703.3.1.
 3. Visual Characters: Section 11B-703.5.
 - a. Character Proportions: Section 11B-703.5.4.
 - b. Stroke Thickness: Section 11B-703.5.7.
 - c. Character Spacing: Section 11B-703.5.8.
 - d. Line Spacing: Section 11B-703.5.9.
 4. Pictograms: Section 11B-703.6.
 - a. Pictogram Field: 11B-703.6.1.
 - 1) Characters and Braille shall not be located in the pictogram field.
 - b. Finish and Contrast: Section 11B-703.6.2.
 - 1) Pictograms and their field shall have a non-glare finish. Pictograms shall contrast with their field with either a light pictogram on a dark field or a dark pictogram on a light field.
 - c. Text Descriptors: Section 11B-703.6.3.
 - 1) Locate text descriptors directly below the pictogram field.
 - 2) Text shall be raised characters with braille directly below.
 5. International Symbol of Accessibility: Section 11B-703.7.2.1.
 6. Toilet Room Door Symbols: Section 11B-703.7.2.6.
 7. Tactile Exit Signs: Tactile exit signage to comply with 1013.4 and 11B-703.4.
- C. Sustainable Design:
1. VOC emissions for field-applied adhesives, sealants, and sealant primers must comply with limits specified in Section 01 6116.

2.2 PLASTIC SIGNS - TACTILE

- A. Materials, Unless Otherwise Noted:

SIGNAGE
SECTION 10 1400
3595001

1. Manufacturer and Product: "Inlaid Tactile Sign" by Accent Signage Systems, Inc. Minneapolis, MN, 800-215-9437 as specified and the basis of design; Ellis & Ellis Sign Systems, Sacramento, CA, 916-924-1936; ASI-Modulex, Los Altos, CA, 650-940-1354; Weidner Architectural Signage, Sacramento, CA; or equal.
 - a. Sign Face: Two 1/8-inch plies with eased edges; New Hermes "Gravo-Tac," or equal.
 - 1) Total Thickness: 1/4 inch.
 - 2) Painted signs will not be accepted.
 - b. Tactile Text: Provide tactile text and "Raster" Braille at plastic tactile signage.
 - 1) Tactile text shall be inlaid into sign face 1/32-inch and raised 1/32- inch minimum above sign face surface.
 - 2) Inlaid text shall be 1-ply, 1/16-inch thick material; "Gravo-Tac" Exterior or equal.
 - 3) Provide text and graphics precisely formed, uniformly opaque to comply with relevant ADA regulations and requirements indicated for size, style, spacing, content, position and colors.
 - 4) Symbols where specified shall be International Style.
 - 5) Braille shall be Contracted (Grade 2) Braille.
 - a) Dots shall be 0.10-inch on centers in each cell, 0.30-inch on center between corresponding dots in adjacent cells, and 0.395-inch minimum to 0.400-inch maximum on center between corresponding dots in cell directly below.
 - b) Dots shall be raised a minimum of 0.025-inch and a maximum of 0.037-inch above the background, and a base diameter of 0.059-inch minimum and 0.063- inch maximum.
 - c) Dots with straight sides and flat tops are not acceptable.
 - c. Colors: High contrast, non-glare, integral colors for graphics.
 - 1) Integral materials shall be U.V. stabilized.
 - 2) Characters, symbols and pictograms shall be in high contrast (light color) with background (dark) color and must conform to the CBC and the ADA Standards.

B. Fabrication:

1. Panel Appearance: Manufacturer's standard, high contrast, semi-matte colors.
2. Surface Texture: Matte Non-glare.
3. Character Style, Size and Layout Position:
 - a. Characters shall be 1-inch high, unless otherwise indicated.
 - b. The stroke of the uppercase letter "I" shall be 15 percent maximum of the height of the character.
 - c. The width of the uppercase letter "O" shall be 60 percent minimum and 110 percent maximum of the height of the uppercase letter "I".

SIGNAGE
SECTION 10 1400
3595001

- d. Character style to be Sans Serif, uppercase, accompanied by Braille directly below text at all locations where raised characters are required.
 - e. Spacing between baselines of separate lines of raised characters with a message shall be 135 percent minimum and 170 percent maximum of the raised character height.
 - 4. Text Schedule: Confirm text, symbols and numbering with the Architect and Owner.
 - 5. Sign Size: As indicated on the Drawings or, if not shown, as reasonably required to accommodate text, symbols and Braille.
 - a. Where signs are installed on window glazing, fabricate a blank sign back to match in size and shape to sign.
 - b. Sign backs shall cover back side of sign from view through window on opposite side of sign.
 - c. Signs that are mounted back-to-back on glazing are to be matching in size; the smaller sign is to be increased in size as reasonably required to match the larger sign.
 - 6. Sign Shape: As indicated on the Drawings.
 - a. Corners: Radiused, unless otherwise shown.
 - 7. Inlaid Letter Adhesion Process: Inlaid material shall be adhered into 1/32-inch deep routed sign face utilizing the heat and pressure bonded/chemically welded process as developed by Accent Signage Systems for the specified "Inlaid Tactile Sign."
 - a. Sign manufacturers for the specified "Inlaid Tactile Sign" shall be familiar with and utilize the exact same manufacturing process developed by Accent Signage Systems.
 - b. Manufacturer must utilize the same and required equipment, products and techniques necessary to produce authentic "Inlaid Tactile Signs" as developed by Accent Signage Systems.
 - c. Other adhesive products and methods, including applied adhesive tapes will not be accepted.
- C. Sign Types: Provide braille translation directly below the raised characters.
- 1. Room Identification Sign: Provide as shown on the Drawings.
 - a. Provide name and room number at each door indicated.
 - b. Names and numbers to be reviewed and approved by Architect and Owner prior to fabrication.
 - c. Allow an average of 4-numbers and 14-letters for each sign.
 - d. Sign to be provided adjacent to doors as shown.
 - 2. Toilet Room Identification Sign: In addition to the specified Door Symbol, provide a Toilet Room Identification Sign at the strike side of every toilet room door.
 - a. Sign shall include an International Symbol of Accessibility, pictogram, and raised characters, specifying the room name with Braille translation below pictogram.
 - 3. Tactile Exit Sign:

SIGNAGE
SECTION 10 1400
3595001

- a. Provide with text in raised characters to read: "EXIT".

2.3 PLASTIC SIGNS - NON-TACTILE

A. Materials, Unless Otherwise Noted:

Manufacturer and Product: Acrylic panel sign as manufactured and distributed by Ellis & Ellis Sign Systems, 916-924-1936, as specified and the basis of design, or equal.

1. Sign Face: 1/4-inch, matt finish, non-glare acrylic with subsurface vinyl and paint. Painted faces will not be accepted.
2. Colors: Colors shall match specified Tactile Signs and as selected by Architect and Owner.
 - a. Integral materials shall be U.V. stabilized.
 - b. Graphics and text shall be in high contrast (dark color) with background (light) color.

B. Fabrication:

1. Sign Thickness: 1/4-inch.
2. Character Style, Size and Layout Position:
 - a. Characters shall be a minimum of 1-inch high, unless otherwise indicated.
 - b. The stroke thickness of the uppercase letter "I" shall be 10 percent minimum and 20 percent maximum of the height of the character.
 - c. The width of the uppercase letter "O" shall be 60 percent minimum and 110 percent maximum of the height of the uppercase letter "I".
 - d. Letter style to be Sans Serif, uppercase.
 - e. Space characters 10 percent minimum and 35 percent maximum of height of characters, measured between two closest points of adjacent characters, excluding word spaces.
 - f. Spacing between baselines of separate lines of characters within a message shall be 135 percent minimum and 170 percent maximum of character height.
3. Text Schedule: Confirm text, symbols and numbering Architect and Owner using the shop drawing/submittal process.
4. Sign Size: As indicated on the Drawings or, if not shown, as reasonably required to accommodate text and symbols.
 - a. Where signs are installed on window glazing, fabricate a blank sign back to match in size and shape to sign.
 - b. Sign backs will cover back side of sign from view through window on opposite side of sign.
5. Sign Shape: As indicated on the Drawings or, as reasonably required to accommodate the specified text and size at lettering.
 - a. Corners: 1/4-inch radius, unless otherwise shown.

C. Sign Types:

1. Toilet Room Door Symbol: Provide one of the following symbols as appropriate to the toilet room type. Toilet Room Door Symbols shall have a color contrast that is distinctly different from the color of the door. Characters, as shown, to be flush with face of symbol. The entire background color must contrast with door. A thin contrasting border around the symbol, with remainder of sign background in a non-contrasting color is not allowed.
 - a. Girls: 12-inch diameter circle, with eased edges.
 - b. Boys: Equilateral triangle with sides 12-inches long, with eased edges.
 - c. Women: 12-inch diameter circle, with eased edges.
 - d. Men: Equilateral triangle with sides 12-inches long, with eased edges.
 - e. Unisex or Staff: equilateral triangle of contrasting color and super imposed on and geometrically inscribed within the face of 12-inch diameter circle, which is a contrasting color to the door. The vertices of the triangle symbol shall be located $\frac{1}{4}$ -inch maximum from the edge of the circle with the vertex pointing upward. Both the circle and triangle to have eased edges.
2. Occupancy Signs (Capacity Sign): Quantity of occupants shall be as indicated on the Drawings or as provided by Architect. Text to read as follows:
 - a. Maximum Number - General: "The number of people permitted in this room shall not exceed _____ by order of the Division of the State Architect."
 - b. Rooms Used for Assembly and Dining: "The number of people permitted in this room shall not exceed _____ for Assembly and _____ for Dining by order of the Division of the State Architect."
3. Assistive Listening System Sign: Provide as indicated on the Drawings.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Prior to installation, carefully inspect and verify that the installed work of other trades is complete to the point where this installation may properly commence.
- B. Verify that specified items may be installed in accordance with the approved design.
- C. In the event of discrepancy, immediately notify Architect. Do not proceed in discrepant areas until discrepancies have been fully resolved.

3.2 INSTALLATION OF SIGNS

- A. General: Locations of signs must be in accordance with the Drawings and approved shop drawings.
- B. Plastic Signs:
 1. General:
 - a. Provide both mechanical fasteners and either adhesive or 2-sided adhesive tape as recommended by manufacturer for given mounting substrate.

SIGNAGE
SECTION 10 1400
3595001

- b. Fasteners: Minimum 4-recessed flush head tamper-proof (vandal-resistant) screws per sign.
- 2. Wood and Metal Framed Walls: Mechanical fasteners shall be of adequate length to penetrate exterior finishes and provide secure embedment into wall structure or sheathing.
- 3. Concrete Walls:
 - a. Use vinyl tape and mounting holes for countersunk, vandal-proof expansion anchors (use both).
- 4. Glass:
 - a. Utilize mounting adhesive and silicone where signs are mounted to glass.
 - b. Provide vinyl window sign backer to match sign face size, mounted on opposite side of glass.
 - c. Signs mounted back-to-back are to be matching in size.
 - d. Do not pre-drill signs for mechanical fastening where sign is to be mounted to glass.
- C. Other Signs: Use mounting method that is permanent, vandal resistant, and has been approved by the Architect.

3.3 PROTECTION

- A. Protect work and materials of this Section and other Sections prior to and during installation, and protect the installed work and materials of all other trades.
- B. In the event of damage, immediately make all repairs and replacements necessary to the approval of the Architect and at no additional cost to the Owner.

3.4 ADJUSTING AND CLEANING

- A. Remove all dust, dirt, finger marks, etc. from signs and letters using cleaning methods as recommended by manufacturer.

END OF SECTION

p:\sacramento\3595 tracy unified school district\001-000_villalovoz es new shade structures\08 specifications\06 spec\04 final\jacobson\10 1400_ signage.docx
Last Updated: March 30, 2021

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Toilet accessories.

1.2 RELATED REQUIREMENTS

- A. Division 26, Electrical.

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the state Architect (DSA).
- B. California Green Building Standards Code (CAL Green), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Submittal Procedures:
 - 1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
 - 2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
- B. Coordination: Coordinate with other trades as required to ensure proper and adequate provision in framing and wall finish for the installation of the selected toilet accessories in the locations required including recessed items)

1.5 ACTION SUBMITTALS

- A. Shop Drawings: Submit showing parts, connections and anchorages, adjacent materials, fully dimensioned and noted.
- B. Product Data: Submit list of each required accessory and complete descriptive data of products proposed for use. Include manufacturer's specifications, published warranty, installation instructions, and maintenance instructions.

1.6 INFORMATIONAL SUBMITTALS

- A. Sample of manufacturer's warranty.

1.7 CLOSEOUT SUBMITTALS

- A. Warranty/Guarantee: Submit executed warranty and Subcontractor's guarantee.

TOILET ACCESSORIES
SECTION 10 2813
3595001

- B. Keys for lockable accessories.
- C. Maintenance data and operating instructions.

1.8 QUALITY ASSURANCE

- A. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.
- B. Use materials and products of one manufacturer whenever possible.
- C. All materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.

1.9 DELIVERY, STORAGE AND HANDLING

- A. Deliver undamaged products to job in manufacturer's sealed containers and/or original bundles with tags and labels intact.
- B. Store materials in protected, dry conditions off of ground and in areas so as to not interfere with the progress of the Work.
- C. Transport, store and handle in strict accord with the manufacturer's written recommendations.

1.10 FIELD CONDITIONS

- A. Make and be responsible for field dimensions necessary for proper fitting and completion of Work. Report discrepancies to Architect before proceeding.
- B. Verify wall depths are adequate for each item prior to ordering. Notify Architect of conflicts or discrepancies.

1.11 WARRANTY

- A. Manufacturer: In addition to the Contractor's and Subcontractor's Guarantee, furnish Owner with manufacturer's fully executed written warranty for toilet accessories against defects in materials and workmanship, agreeing to replace and install toilet accessories at no additional cost to the Owner, within warranty period as follows:
 - 1. For a period of 3 years.

PART 2 - PRODUCTS

2.1 OWNER FURNISHED CONTRACTOR INSTALLED PRODUCTS

- A. The following products will be furnished by the Owner for installation by Contractor. Provide adequate blocking for attachment. Miscellaneous items are to be provided and installed by Contractor.

1. Toilet Tissue Dispensers.

2.2 DESIGN AND PERFORMANCE CRITERIA

- A. Conform to applicable requirements of ADA and CBC for accessibility. When in conflict, conform to the most stringent.

2.3 MANUFACTURERS

- A. Accessories: Bobrick Washroom Equipment Inc. or Bradley Corporation as specified and the basis of design, unless otherwise noted, or equal.
 1. Manufactured accessories not specified shall require approval as a substitution to be considered equal. Refer to substitution requirements specified in Section 01 3300, Submittal Procedures.
 2. Although multiple manufacturers may be specified for a specific accessory, all accessories shall be the product of a single manufacturer, unless otherwise specified or approved.

2.4 MANUFACTURED UNITS

- A. Grab Bars: 18 gauge 1-1/2 inch outside diameter, type 304 stainless steel welded to 1/8 inch type 304 solid stainless steel wall plates; Bobrick Series B-6806, Bradley 812 Series, or equal.
 1. Configurations and Lengths: As shown.
 2. Grab bar shall withstand a 250 pound point load.
 3. Joints ground and polished.
 4. Finish on Exposed Surfaces: Satin.
 5. Fastening: Concealed, vandal resistant.

2.5 FASTENINGS

- A. Toilet accessories shall be complete with required fastenings.
- B. Fastenings shall either harmonize with the item being fastened, or be of the concealed type.
- C. Exposed fastenings shall be theft and vandal-resistant.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Prior to installation of the Work of this Section, carefully inspect and verify that the installed Work of other trades is complete to the point where this installation may properly commence.
- B. Verify that specified items may be installed in accordance with the approved design.

TOILET ACCESSORIES
SECTION 10 2813
3595001

- C. In the event of discrepancy, immediately notify the Architect. Do not proceed in discrepant areas until discrepancies have been fully resolved.

3.2 PREPARATION

- A. The Contractor shall provide recesses, anchorage and back-up blocking in sizes and in locations as required for proper installation of accessories. Coordinate with other trades where necessary to make provisions for installation.
- B. Securely anchor items in place in locations and at mounting heights indicated. Where specific dimensions are not noted, installation shall be approved by the Architect.
- C. Securely fasten grab bar mounting plates to solid framing or blocking, in accordance with CBC.
- D. Provide cut-outs in toilet partitions for napkin disposal units as required.

3.3 INSTALLATION

- A. Install fixtures, accessories and items in accordance with manufacturers' printed instructions and requirements in the 2022 CBC 11B-603.5 where shown or as approved by Architect.
- B. Mount surface-mounted accessories to solid backing or blocking.
- C. Install plumb and level, securely and rigidly anchored to substrate.
- D. Use concealed vandal-resistant fastenings wherever possible.
 - 1. Adhesive installation not permitted.
 - 2. Provide anchors, bolts and other necessary fasteners, and attach accessories securely to walls or toilet partitions as recommended by manufacturer for each item and each type of substrate condition.
- E. Grab bars: Solidly anchor grab bars to withstand minimum downward pull of 500 pounds between any 2 supports after installation.
- F. Verify type, location and attachment methods of items furnished by Owner to ensure proper preparation of substrate for solid attachment of accessories.
- G. Sealants: Comply with requirements of Section 07 9200, Joint Sealants.
 - 1. Apply behind toilet accessories as necessary to ensure sanitary and watertight integrity of surfaces.
 - 2. Conceal sealants.

3.4 CLEANING AND ADJUSTING

- A. Upon completion of installation, remove manufacturer's temporary labels, marks of identification.
- B. Thoroughly wash surfaces, remove foreign materials, polish surfaces.

TOILET ACCESSORIES
SECTION 10 2813
3595001

- C. Leave entire accessories in neat, orderly, clean, acceptable condition as approved.
- D. Replace damaged parts, surfaces which are not free from imperfections.

3.5 PROTECTION

- A. Protect Work and materials of this Section prior to and during installation, and protect the installed Work and materials of other trades.
- B. In the event of damage, make repairs and replacements necessary to the approval of the Architect at no additional cost to the Owner.
- C. Exposed finish shall be free from scratches, dents, permanent discolorations and other defects in workmanship or material.

END OF SECTION

*p:\sacramento\3595 tracy unified school district\001-000_villalovoz es new shade structures\08 specifications\06 spec\04
final\jacobson\10 2813_toilet accessories.docx
Last Updated: April 1, 2021*

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Fire extinguishers, hangers and cabinets.
 - 2. Fire hose and extinguisher cabinet.

1.2 RELATED REQUIREMENTS

- A. Section 09 9100, Painting.

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CAL Green), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Submittal Procedures:
 - 1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
 - 2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.

1.5 ACTION SUBMITTALS

- A. Shop Drawings: Submit showing all parts, connections and anchorages, adjacent materials, fully dimensioned and noted. Include in-wall blocking requirements.
- B. Product Data: Submit list and complete descriptive data of all products proposed for use. Include manufacturer's specifications and installation instructions.

1.6 INFORMATIONAL SUBMITTALS

- A. Statement that all extinguishers and cabinets comply with the current applicable UL and NFPA classifications and ratings.
- B. Sample of manufacturer's warranty.

1.7 CLOSEOUT SUBMITTALS

- A. Written instructions to Owner's personnel in the operation, maintenance and charging of the fire extinguishers furnished.

FIRE EXTINGUISHERS AND CABINETS
SECTION 10 4416
3595001

- B. Warranty/Guarantee: Submit executed warranty and subcontractor's guarantee.

1.8 QUALITY ASSURANCE

- A. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.
- B. Single-Source Responsibility: Use materials and products of one manufacturer.
- C. Materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.
- D. Equipment shall be approved by Underwriters' Laboratories, Inc., bear UL Label and be approved by the State Fire Marshal.

1.9 DELIVERY, STORAGE AND HANDLING

- A. Deliver undamaged products to job in manufacturer's sealed containers and/or original bundles with tags and labels intact.
- B. Store materials in protected, dry conditions off of ground and in areas so as to not interfere with the progress of the work.
- C. Transport, store and handle in strict accord with the manufacturer's written recommendations.

1.10 FIELD MEASUREMENTS

- A. Make and be responsible for all field dimensions necessary for proper fitting and completion of work. Report discrepancies to Architect before proceeding.

1.11 WARRANTY

- A. Manufacturer: In addition to the Contractor's and Subcontractor's Standard Guarantee, furnish Owner with manufacturer's fully executed written warranty for fire extinguishers against defects in materials and workmanship for a period of not less than 5 years.

PART 2 - PRODUCTS

2.1 DESIGN AND PERFORMANCE CRITERIA

- A. Conform to all applicable standards of the National Fire Protection Association (NFPA) and California State Fire Marshal (CSFM) for fire extinguisher cabinets and locations.

2.2 FIRE EXTINGUISHERS

- A. Manufacturer: By same manufacturer as fire extinguisher cabinets.
- B. Types:

FIRE EXTINGUISHERS AND CABINETS
SECTION 10 4416
3595001

1. Fire extinguishers - General Use: UL Rating 3A-40BC extinguishers shall be 5-pound nominal capacity multi-purpose dry chemical type, bearing U.L. Label; finish shall be red enameled steel.
- C. Tamperseals on each extinguisher shall be of the breakable metal type, indicating accidental or unauthorized partial discharge.
- D. Pressure gauges on each extinguisher shall be of the dial type.
- E. Mounting Brackets:
 1. Manufacturer: Provide brackets from same manufacturer as fire extinguisher.
 2. Brackets shall be of quick release design, not subject to release by bumping.
 3. Bracket attachments shall be furnished with each bracket, suitable for the surface to which attachment is to be made.

2.3 FIRE EXTINGUISHER CABINETS

- A. General:
 1. Size cabinets to conform to size and number of extinguishers at each location shown on the Drawings.
- B. Manufacturer and Product: "Cosmopolitan" Series by JL Industries, Inc., a division of the Activar Construction Products Group as specified, or equal.
 1. Mounting:
 - a. Type 1: Semi-recessed with 2-1/2 inch return trim, rolled edge, for 3A-40BC fire extinguisher.
 - b. Type 3: Fully-recessed with 3/8 inch flat trim, depth as required.
 2. Door Style: S21 solid with black ABS flush (recessed) pull and continuous hinge.
 3. Latching Device: Manufacturer's standard roller catch.
 4. Finishes:
 - a. Door and Trim: Stainless steel, #4 satin finish.
 - b. Cabinet Box (Tub): Manufacturer's standard white electrostatic powder coat.
 5. Provide mounting clips, suitable for extinguishers being provided, in each cabinet.
 6. Identification: "FIRE EXTINGUISHER" in vertical red color lettering.
 7. Cabinet shall be fabricated to meet ADA and CBC projection criteria.
 8. Welded anchors to be provided appropriate to construction in which cabinet is placed.
 9. Cabinets located in fire rated walls to be "Cosmopolitan Fire FX" Option.

FIRE EXTINGUISHERS AND CABINETS
SECTION 10 4416
3595001

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Prior to installation of work of this Section, carefully inspect and verify that the installed work of all other trades is complete to the point where this installation may properly commence.
- B. Verify that specified items may be installed in accordance with the approved design.
- C. In the event of discrepancy, immediately notify Architect. Do not proceed in discrepant areas until discrepancies have been fully resolved.

3.2 PROTECTION

- A. Protect work and materials of this Section and other Sections prior to and during installation, and protect the installed work and materials of other trades.
- B. In the event of damage, immediately make all repairs and replacements necessary to the approval of the Architect and at no additional cost to the Owner.

3.3 INSTALLATION

- A. Install cabinets and extinguishers where indicated on the Drawings and as required by the local Fire Authority. Where exact location of cabinets is not indicated, locate as directed by Architect.
- B. Install cabinets in accordance with manufacturer's instructions and approved shop drawings.
- C. Install so that handle of extinguisher meets accessibility requirements.
- D. Prepare recesses in walls for cabinets as required by type and size of cabinet and style of trim and to comply with manufacturer's instructions. Provide blocking, backing and other materials necessary for proper attachment and fire rating.
- E. Anchor cabinets and brackets securely in place.
- F. Provide fire extinguisher in each fire extinguisher cabinet.

3.4 INSTALLATION OF FIRE EXTINGUISHERS

- A. Determine approximate completion date of work and then inspect, charge, and tag fire extinguishers not more than 10 calendar days before nor less than one day before actual completion of work.
- B. The installation of the specified fire extinguishers in no way relieves the Contractor from providing adequate fire protection during the course of this work.

FIRE EXTINGUISHERS AND CABINETS
SECTION 10 4416
3595001

END OF SECTION

*p:\sacramento\3595 tracy unified school district\001-000_villalovo es new shade structures\08 specifications\06 spec\04
final\jacobson\10 4416_fire extinguishers and cabinets.docx
Last Updated: September 24, 2021*

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Manual-operated horizontal louver blinds.

1.2 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CAL Green), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- C. National Fire Protection Association (NFPA):
 - 1. 701: Standard Methods of Fire Tests for Flame Propagation of Textiles and Films.
- D. California Administrative Code:
 - 1. Title 19: Public Safety.

1.3 ADMINISTRATIVE REQUIREMENTS

- A. Submittal Procedures:
 - 1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
 - 2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Contract Closeout and Final Cleaning.

1.4 ACTION SUBMITTALS

- A. Shop Drawings: Submit showing parts, connections and anchorages, adjacent materials, fully dimensioned and noted.
- B. Product Data: Submit list and complete descriptive data of products proposed for use. Include Manufacturer's specifications, published warranty or guarantee, installation instructions, and maintenance instructions.
- C. Samples: The following samples are required.
 - 1. Manufacturer's full range of colors for Architect's selection.

1.5 INFORMATIONAL SUBMITTALS

- A. Sample of manufacturer's warranty.

HORIZONTAL LOUVER BLINDS
SECTION 12 2113
3595001

1.6 CLOSEOUT SUBMITTALS

- A. Warranty/Guarantee: Submit executed warranty and Subcontractor's guarantee.

1.7 QUALITY ASSURANCE

- A. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.
- B. Use materials and products of one Manufacturer whenever possible.
- C. Materials, components, assemblies, workmanship and installation are to be observed by the Owner's Inspector of Record. Work not so inspected is subject to uncovering and replacement.
- D. Flame-resistant materials shall pass or exceed one of more of the following:
 - 1. National Fire Protection Association (NFPA) 701.
 - 2. California Administrative Code Title 19.

1.8 DELIVERY, STORAGE AND HANDLING

- A. Deliver undamaged products to job in Manufacturer's sealed containers and/or original bundles with tags and labels intact.
- B. Store materials in protected, dry conditions off of ground and in areas so as to not interfere with the progress of the Work.
- C. Transport, store and handle in strict accord with the manufacturer's written recommendations.

1.9 FIELD CONDITIONS

- A. Verify field measurements for openings to receive vertical blinds allowing proper clearances as recommended by Manufacturer to allow free rotation and traversing.
- B. Prior to shade installation, building shall be enclosed.
- C. Interior temperature shall be maintained between 60 degrees F and 90 degrees F during and after installation; relative humidity shall not exceed 80 percent. Wet work shall be complete and dry.

1.10 WARRANTY

- A. Manufacturer: In addition to the Contractor's and Subcontractor's Guarantee, furnish Owner with manufacturer's fully executed written limited lifetime warranty for the repair or replacement of horizontal louver blinds against defects in materials and workmanship.

PART 2 - PRODUCTS

2.1 PRODUCTS

- A. Model "CD80 1 Mini Aluminum Blind" as manufactured by Hunter Douglas Contract, or equal.

2.2 MATERIALS

- A. Slats: Aluminum alloy, 1 inch wide by .008 inch thick, heat-treated and spring tempered aluminum alloy 6011, with eased corners and manufacturing burrs removed. Furnish not less than nominal 15.2 slats per foot to ensure tight closure and light control.
- B. Slat Support: Braided ladders of 100 percent polyester yarn color compatible with slats and spacing of ladder no more than 20mm, reinforced to withstand 100 pound pull. Distance between ladders not to exceed Manufacturer's requirements.
- C. Headrail: U-shaped profile with rolled edges, measuring 1-3/8 inches x 1-3/8 inches x 0.024 inch constructed of corrosion-resistant steel, providing a beveled edge valance-free design. Ends to be fitted with 0.024 inch steel end lock with adjustable tab for centering blinds. Finish to be standard baked-on polyester and to match slats.
- D. Bottom Rail: Steel with corrosion-resistant finish formed with double-lock seam into closed oval shape for optimum beam and torsional strength. Ends fitted with color-coordinated engineered polymer caps. Finish to be standard baked-on polyester and to match slats.
- E. Lifting Mechanism: Crashproof steel cordlocks with corrosion-resistant finish, two-ply polyester cord filler in braided polyester jacket lift cords, cord equalizers, cordlock adapter, and cord stop / single pull cord. Install within 2022 CBC reach ranges 11B-308.
- F. Tilting Mechanism: Permanently lubricated die-cast worm and gear type tilter gear mechanism in fully enclosed housing with clutch action to protect ladder tapes from over rotation of the solid steel, corrosion resistant tilt rod.
- G. Tilt Control Wand: Tubular shaped 7/16 inch diameter extruded clear plastic, ribbed for positive grip and detachable without tools.
- H. Mounting Hardware: Manufacturer's standard as required for the type of installation shown.
- I. Hold-Down Brackets: Provide metal hold down brackets where blinds are to be mounted on doors.

2.3 FINISHES

- A. Aluminum: Manufacturer's standard baked-on finish in colors selected by Architect from manufacturer's available contract colors utilizing "Dust Shield" finish to inhibit dust build-up for easier maintenance.
- B. Cord and braided ladders shall be color coordinated with slat.

HORIZONTAL LOUVER BLINDS
SECTION 12 2113
3595001

2.4 FABRICATION

- A. Blind measurements shall be accurate to within plus or minus 1/8 inch or as recommended in writing by the manufacturer for the specific installation conditions.
- B. Hardware shall be enclosed in a metal head. Operating hardware shall be machine clinched to head to assure perfect alignment. Slats shall tilt to any angle by turning a transparent wand. Blinds shall fit within the window openings as detailed, unless otherwise indicated.
- C. Other materials and components not specifically described, but required for a complete and proper installation of horizontal window blinds, shall be selected by the Installer, subject to approval of the Architect. Do not intermix component parts of various manufacturers in assembled units.
- D. Prior to fabrication, verify cords and tilt devices will be accessible and operational from the floor and will not conflict with cabinets, doors, fixtures or other items. Locate on either end as directed or approved. Bring potential conflicts to Architect's attention for resolution prior to start of Work.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Prior to installation, carefully inspect and verify that the installed Work of other trades is complete to the point where this installation may properly commence.
- B. Verify that specified items may be installed in accordance with approved design.
- C. In the event of discrepancy, immediately notify the Architect. Do not proceed in discrepant areas until discrepancies have been fully resolved.

3.2 INSTALLATION

- A. Install horizontal window blinds level and true, in accordance with the Drawings and the manufacturer's recommended procedures.
- B. Blinds shall be installed inside mount, unless otherwise indicated. Consult with Architect where inside mount may not be possible.
- C. Provide 1-1/2 inch overlap at each jamb where face installations are indicated or approved.
- D. Divisions between blinds, where required, shall occur only at mullions.
- E. Install intermediate support brackets and extension brackets as needed to prevent deflection in headrail.

3.3 CLEANING AND ADJUSTING

- A. Test operation of horizontal window blind hardware before and after installation. Operation shall be smooth and uniform.
- B. Upon completion of installation, remove manufacturer's temporary labels, marks of identification. Thoroughly wash surfaces and remove foreign material. Leave entire Work in neat, orderly, clean and acceptable condition as approved. Replace damaged parts and surfaces which are not free from imperfections.
- C. Finish installation free of dirt and finger marks. Leave work area clean and free of debris.

3.4 PROTECTION

- A. Protect Work and materials of this Section prior to and during installation, and protect the installed Work and materials of other trades.
- B. In the event of damage, make repairs and replacements necessary to the approval of the Architect at no additional cost to the Owner.
- C. Exposed finishes shall be free from scratches, dents, permanent discolorations and other defects in workmanship or material.

END OF SECTION

*p:\sacramento\3595 tracy unified school district\001-000_villalovo es new shade structures\08 specifications\06 spec\04
final\jacobson\12 2113_horizontal louver blinds.docx
Last Updated: April 2, 2021*

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Manufactured, plastic-laminate-faced, modular casework and accessory items.

1.2 RELATED REQUIREMENTS

- A. Section 01 6116, Volatile Organic Compound (VOC) Content Restrictions, for VOC limits pertaining to adhesives, sealants, fillers, primers, and coatings.
- B. Section 01 8113, Sustainable Design Requirements, for CAL-Green general
- C. Section 06 4023, Interior Architectural Woodwork.
- D. Section 09 2900, Gypsum Board.
- E. Section 09 9100, Painting.
- F. Section 12 3623, Plastic-Laminate-Clad Countertops.
- G. Division 26, Electrical, for electrical outlets and fittings built into architectural casework.

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as note on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CALGreen), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- C. American National Standards Institute (ANSI):
 1. ANSI A208.2: Medium Density Fiberboard for Interior Use.
 2. ANSI/BHMA A156.9: American National Standard for Cabinet Hardware; Builders Hardware Manufacturers Association.
 3. ANSI/BHMA A156.18: American National Standard for Materials and Finishes; Builders Hardware Manufacturers Association.
- D. National Electrical Manufacturers Association (NEMA):
 1. NEMA LD3.1: "High-Pressure Decorative Laminates."
- E. Woodwork Institute (WI)/ Architectural Woodwork Manufacturers of Canada (AWMAC):
 1. North American Architectural Woodwork Standards (NAAWS).

MANUFACTURED PLASTIC-LAMINATE-CLAD CASEWORK
SECTION 12 3216
3595001

1.4 DEFINITIONS

- A. General: The following definitions are in conformance with those included in the referenced NAAWS document.
- B. "Exposed Exterior" surfaces include all surfaces visible when doors and drawers are closed.
 - 1. Bottoms of casework more than 4 feet above the floor will be considered an exposed surface.
 - 2. Tops of casework that are visible by building occupants from stairs, mezzanines or other elevated locations will be considered as exposed.
- C. "Exposed Interior Surfaces" surfaces exposed to view in open casework or behind glass doors.
- D. "Semi-Exposed Surfaces" are interior surfaces only exposed to view when doors or drawers are open.
- E. "Concealed Surfaces" include surfaces of sleepers, web frames, dust panels, and other surfaces that are not visible after installation.

1.5 ADMINISTRATIVE REQUIREMENTS

- A. Submittal Procedures:
 - 1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
 - 2. Sustainable Design Submittals shall comply with the additional requirement of Section 01 8113, Sustainable Design Requirements.
 - 3. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
- B. Scheduling and Coordination:
 - 1. Require casework fabricator to examine the schedule and check it for timing, accuracy and compatibility with its work and shall coordinate work with the master schedule and job superintendent.
 - 2. Require casework fabricator to furnish assistance in coordination and scheduling of other work pertinent to casework installation and to notify Contractor of requirements so as to result in a well-coordinated job.

1.6 ACTION SUBMITTALS

- A. Shop Drawings:
 - 1. Submit dimensioned plans, elevations, component profiles, and details for each casework layout showing the following:
 - a. Locations and type of service fixtures with lines thereto; anchorage locations, installation details to floors and walls.

MANUFACTURED PLASTIC-LAMINATE-CLAD CASEWORK
SECTION 12 3216
3595001

- b. Relationship of units in to surrounding and adjacent construction including walls, doors, and windows.
 - c. Swing of doors.
 - d. Shelving.
 - e. Accessory items such as fillers, end panels, and valance.
 - f. Base height.
 - 2. First page of shop drawings and each elevation shall bear an individually serial-numbered WI "Certified Compliance Label."
- B. Product Data:
- 1. Provide manufacturers cut sheets for all materials proposed for use including:
 - a. Panel products.
 - b. Cabinet hardware items.
 - c. Laminates.
 - 2. Include manufacturer's literature for items which are proposed for use and specified herein only by listing the intended performance requirements.
- C. Samples: The following samples are required.
- 1. Each type of high pressure laminate (HPL), edge banding, cabinet liner, and melamine-faced panel.
 - a. Plastic laminate and edge banding to be selected from manufacturers' full range of colors by Architect.
 - 2. Hardware: Adjustable shelf clip, hinge, pull, magnetic catch, elbow catch and lockset. Returned hardware samples may be used on the project unless otherwise noted by the Architect.

1.7 INFORMATIONAL SUBMITTALS

- A. Before delivery of casework to jobsite, submit a WI "Certified Compliance Certificate" listing the items certified, the applicable NAAWS Grade, and whether installation is included.
- B. Qualification Data: For installer.
- C. Sample of manufacturers' warranty.
- D. Sustainable Design:
 - 1. General:
 - a. Submit information necessary to establish and document compliance with the California Green Building Standards Code.
 - b. Sustainable design submittals are in addition to other submittals.
 - 2. The following information shall be provided:
 - a. Composite Wood: Evidence of compliance that products meet formaldehyde limits of current CARB Airborne Toxic Control Measure (ATCM) as specified in Section 01 6116.

MANUFACTURED PLASTIC-LAMINATE-CLAD CASEWORK
SECTION 12 3216
3595001

- b. Adhesives and Sealants: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.

1.8 CLOSEOUT SUBMITTALS

- A. Warranty: Submit executed warranty.
- B. **[Specified maintenance materials]**

1.9 MAINTENANCE MATERIAL SUBMITTALS

- A. Provide additional materials as follows:
 - 1. Hinges: 10 each.
 - 2. Pulls: 10 each.
 - 3. Cabinet Locks: 10 each.
 - 4. Adjustable Shelf Supports: 25 each.
- B. Deliver to Owner as directed.

1.10 QUALITY ASSURANCE

- A. General:
 - 1. Furnish all components and accessories and all allied products new and free from defects.
 - 2. To assure proper coordination and eliminate divided responsibility, all work specified in this Section shall be executed under the direction of a single manufacturer and supplier.
- B. Qualifications:
 - 1. Manufacturer: The casework manufacturer must have not less than 5 years of production experience similar to this project, and the specified product, and whose qualifications indicate the ability to comply with the requirements of this section.
 - 2. Installer: The installer must have at least one project in the past 5 years with similar systems and complexities to those required for this project, and where the value of the woodwork is a minimum of 80% of the cost of woodwork for this project.
- C. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.
- D. Single-Source Responsibility: Use materials and products of one manufacturer whenever possible.
- E. Materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.
- F. Casework Designations:

MANUFACTURED PLASTIC-LAMINATE-CLAD CASEWORK
SECTION 12 3216
3595001

1. Reference numbers on Drawings are related to NAAWS Cabinet Design Series (CDS) Elevation numbers, and are used to identify prefinished casework and to indicate dimensions, general design, equipment, shelving (adjustable and fixed) and other components to be furnished. Unless modified by notation on Drawings, description for indicated number shall constitute requirements for such cabinets incorporating all features set forth in the NAAWS CDS Elevations.
 2. Use of the NAAWS CDS Elevations numbers, and specific requirements set forth on the Drawings and as specified, are not intended to preclude use of other manufacturer's product or procedure, which may be equal thereto, but are given to establish standard of design and quality of materials, construction and workmanship.
- G. Proof of compliance with the specified NAAWS Grade assembly and installation shall be provided by the following WI Quality Control Program:
1. WI Monitored Compliance Program.
 - a. All casework and the installation thereof for this project shall be directly monitored for compliance to the Contract by the Woodwork Institute under the scope of their Monitored Compliance Program (MCP).
 - 1) Inspections are to be performed at the beginning of fabrication, at the time of delivery to the job, at the beginning of installation, at completion of installation.
 - 2) Further information on the WI Monitored Compliance Program's Policies and Procedures are available directly from the Woodwork Institute, 916-372-9943.
 - 3) The WI MCP Registration Number shall be referenced in all communication.
 - b. Fees charged by the Woodwork Institute for their monitored compliance service are the responsibility of the Contractor and shall be included in the Contract sum.
 - c. Casework and/or installation determined to be non-compliant by WI and not corrected will be rejected.
 - d. Issuance of the WI Monitored Compliance Certificate is a prerequisite of the Owner's final acceptance.
- H. Mockups: Provide mockup of one base cabinet and one wall hung cabinet to verify finish material selections, modifications made under sample submittals, and to demonstrate aesthetic effects and set quality standards for materials and execution for cabinet exteriors, interior construction, and hardware.
1. The base cabinet is to have at least one drawer and be of the same material to be provided for the project.
 2. The approved mockup may be incorporated in the project.
- 1.11 DELIVERY, STORAGE AND HANDLING**
- A. Deliver undamaged products to job in manufacturer's sealed containers and/or original bundles with tags and labels intact.

MANUFACTURED PLASTIC-LAMINATE-CLAD CASEWORK

SECTION 12 3216

3595001

- B. Store materials in protected, dry conditions off of ground and in areas so as to not interfere with the progress of the work.
- C. Transport, store and handle in strict accordance with the manufacturer's recommendations.
- D. Do not deliver until wet operations in building are completed and storage area is closed in and broom clean, with relative humidity 50 percent or less at 70 degrees F.
- E. Deliver in sections to fit through openings.

1.12 FIELD CONDITIONS

- A. Environmental Limitations: Do not deliver or install casework until building is enclosed, wet-work is complete, and HVAC system is operating and maintaining temperature and relative humidity at levels planned for building occupants during the remainder of the construction period.
- B. Products shall be available at project when required for installation so as not to delay job progress. Installer for these products shall cooperate with installers performing work under other sections involved to effect proper installation.
- C. Casework fabricator shall coordinate installation of any Owner supplied equipment where indicated on the Drawings.
- D. Field Measurements: Make and be responsible for all field dimensions necessary for proper fitting and completion of work. Report discrepancies to Architect before proceeding.

1.13 WARRANTY

- A. Manufacturer: In addition to the Contractor's Standard Guarantee, furnish Owner with manufacturer's fully executed written 5-year warranty for casework against defects in materials and workmanship. Warranty shall include against delaminations, joint separations, warp or twist in doors more than 1/4 inch, and splits or cracks in finished surfaces.

PART 2 - PRODUCTS

2.1 DESIGN AND PERFORMANCE CRITERIA

- A. Sustainable Design:
 - 1. Composite wood products must meet current formaldehyde emission limits of CARB Airborne Toxic Control Measure (ATCM) as specified in Section 01 6116.
 - 2. VOC emissions for field-applied adhesives, sealants, and sealant primers must comply with limits specified in Section 01 6116.

2.2 PANEL MATERIALS

- A. Medium-Density Fiberboard (MDF): ANSI A208.2, Grade 155, formaldehyde-free, and meeting grade MR30 moisture resistance; "Medite II," by Roseburg, or equal.
 - 1. Thickness: 3/4 inch, unless otherwise shown or specified.
- B. Thermally-Fused Melamine Panels (TFM): Melamine resin-impregnated decorative paper thermally fused to a formaldehyde free MDF core.
 - 1. Color: White, unless otherwise noted or selected by Architect from a minimum of 6 colors.
- C. Plywood: Exterior type, Grade B-C or better. Plywood to be free of urea-formaldehyde.
- D. Hardboard: Tempered Grade, conforming to standards of American Hardboard Association or PS-50; use smooth side exposed.
- E. Particle Board: Not permitted.

2.3 LAMINATE MATERIALS

- A. High-Pressure Plastic Laminate: Conforming to NEMA LD3.1 and ISO 4586-2.
 - 1. Grades:
 - a. Horizontal Surfaces: ISO 10/HGS; horizontal, general purpose, standard.
 - b. Vertical Surfaces: ISO 20/VG; vertical, general purpose.
 - c. Cabinet Liner (If Specified TFM Panel is Not Used): ISO 72/CLS, cabinet liner, standard.
 - d. Backing Sheet: ISO 91/BKL; backer, light duty.
 - 2. Manufacturers: Formica, Wilsonart, Arborite, Pionite, Nevamar, or equal.
 - 3. Colors, and Patterns:
 - a. Exposed: As selected by Architect from manufacturer/suppliers' full product color range.
 - 1) There will be no additional cost allowance for premium color selections, or for selection of different colors for different rooms up to a maximum 6 colors.
 - 2) Doors and frames may be different selections.
 - b. Cabinet Liner: White.

2.4 ADDITIONAL MATERIALS

- A. Edge Bandings:
 - 1. 3-mm thick PVC: Solid, high impact, purified, color-thru, acid resistant, pre-laminated primed edging, machine-applied with hot melt adhesives, automatically trimmed, inside/outside length-radiused for uniform appearance, buffed and corner-radiused for consistent design.
 - a. Locations: Door and drawer face edge, and exposed shelf edge.

MANUFACTURED PLASTIC-LAMINATE-CLAD CASEWORK
SECTION 12 3216
3595001

- b. Color: As selected by Architect from manufacturer's full range of standard colors.
- 2. 0.02-inch thick PVC: Flat Edge, solid, high impact, purified, color-thru, acid resistant PVC, edging machine-applied with hot melt adhesives, automatically trimmed face, back and corners for uniform appearance.
 - a. Locations:
 - 1) Drawer body edge, not drawer face, and cabinet body edge including door and drawer front spacer rail.
 - 2) Interior body component edging, interior dividers and interior shelving.
 - b. Color: Match cabinet interior surface color.

2.5 HARDWARE

- A. Comply with requirements of BHMA A156.9, Type 2 (Institutional).
- B. Finishes:
 - 1. Exposed Items: Satin chromium plated, 626, unless otherwise noted complying with ANSI/BHMA A156.18.
 - 2. Concealed Items: Manufacturer's standard finish, complying with applicable product class of ANSI/BHMA A156.9.
- C. Hinges:
 - 1. Type: Heavy duty, five knuckle, 2-3/4-inch, institutional type hinge; let into door to achieve 1/8 inch reveals; Part Number 374 by Rockford Process Control, or equal, unless otherwise recommended by fabricator for total door and side panel thickness after application of laminate finish.
 - a. Hinges shall be mill ground, hospital tip, tight pin feature with all edges eased.
 - b. Hinges to be full wrap around type of tempered steel 0.095 inch thick.
 - c. Hinges shall accommodate 3/4 inch thick laminated door and allow 270 degree swing.
 - 2. Fasteners: Each hinge to have minimum 9 screws, #7, 5/8 inch FHMS to assure positive door attachment. Fill all holes if greater than 9.
 - 3. Quantity:
 - a. One pair per door to 48 inches in height.
 - b. One and one-half pair 48 inches in height to 84 inches in height.
 - c. Over 84 inches in height, provide 2 pair of hinges.
- D. Door and Drawer Pulls: Hafele, Catalog No. 110.08.400, or equal.
- E. Magnetic Catches: Häfele 246 with matching strike plate, matt nickel finish, or equal.
- F. Locks: CompX National Lock C8100 Series pin tumbler, or equal.
 - 1. All cabinets in each Room to be keyed alike.
 - 2. All Rooms to be keyed different.

MANUFACTURED PLASTIC-LAMINATE-CLAD CASEWORK
SECTION 12 3216
3595001

- 3. Locations: As indicated on the Drawings.
- G. Locks: Schlage CL2000 Series cabinet and drawer locks with solid brass 6 pin cylinders.
 - 1. Locks in rooms keyed alike; rooms keyed differently.
- H. Surface Bolt for Locked Pair Doors: Elbow Catch: #2 Elbow Catch by Ives, or equal.
 - 1. Finish: Satin chrome.
 - 2. Locate and mount surface bolt on door far enough below shelf to allow for 1/2-inch deflection of shelf and also to allow for proper engagement of surface bolt and angle strike.
- I. Drawer Guides: Accuride as specified, or equal:
 - 1. Drawers Less Than 24 inches Wide: Light duty, full extension; Model 3732.
 - a. Provide appropriate length.
 - b. Load Rating per Pair: 100-pounds.
 - 2. Drawers 24 inches to 36 Inches Wide: Medium duty with 1-inch over travel; Model 3301.
 - a. Provide appropriate length.
 - b. Load Rating per Pair: 150-pounds.
 - 3. Drawers 36-inches to 42-inches Wide: Heavy-duty with 1-inch over travel; Model 3634.
 - a. Provide appropriate length.
 - b. Load Rating per Pair: 200-pounds.
 - 4. Drawers 42-inches to 48-inches Wide: Heavy duty with 1-inch over travel; Model SS5321.
 - a. Provide appropriate length.
 - b. Load Rating per Pair: 350-pounds.
- J. Adjustable Shelf Supports: Seismic restraining type; "Universal 1" by Hettich International for insertion into 5 mm holes, or equal.

2.6 ADDITIONAL MATERIALS

- A. Bumper Pads (Silencers): Hemispherical, quiet clear type, 55 Shore A hardness; 3M Bumpon Protective Products, or equal.
- B. Adhesive: As recommended by panel manufacturer best suited for the intended use and that has a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
- C. Glue: Aliphatic-resin, polyurethane, or resorcinol wood glue recommended by manufacturer for general carpentry use that has a VOC content of 30 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
- D. Fasteners: Size and type to suit application in accordance with specified standards and as required.

MANUFACTURED PLASTIC-LAMINATE-CLAD CASEWORK
SECTION 12 3216
3595001

2.7 FABRICATION - GENERAL

- A. Construction shall conform to NAAWS casework requirements.
- B. Make job measurements as required for proper fabrication of the work.
- C. Grade: Custom. If provisions for the NAAWS Grade are in conflict with, or modified by the drawings and/or specifications, the modifications shall govern.
- D. Door and Drawer Front Style: Flush overlay, NAAWS Style A.
- E. Carcass Construction: Type A frameless. Provide as single unit at open shelving to greatest extent possible.

2.8 FABRICATION OF CABINET COMPONENTS

- A. Cabinet Bodies:
 - 1. Fabricate, assemble and finish each cabinet as complete, self-supporting unit.
 - a. Unless otherwise shown, counter height and tall storage units shall be 24 inches minimum overall depth; wall-hung units shall be 15 inches minimum overall depth.
 - b. At concealed locations, provide tops on all wall-hung and tall cabinets utilizing melamine on both faces.
 - c. At locations where the tops of wall hung or tall cabinets are visible, provide tops on all wall-hung and tall cabinets utilizing HPL on exterior face and melamine on interior face.
 - d. Fabricate bottoms, tops and frames of lock-joint glued and screwed, or dowelled and glued construction to end panel construction. Simple butted not permitted.
 - e. Tops and sides of tall units and wall-hung cabinets shall be 3/4-inch thick MDF core.
 - f. Bottoms of upper cabinets shall be constructed of same materials as specified for shelving.
 - g. Tall cabinets and base cabinets, fronts and sides shall be 3/4-inch thick MDF core.
 - h. Cabinet backs shall be a minimum of 1/4-inch thick.
 - i. Dowel and screw partitions and boxed shelves into top framing, bottoms or ends, as applicable.
 - j. Middle shelf of tall cabinets, 5 feet or greater in height, shall be fixed.
 - k. At top of counter height units, provide 3/4-inch plywood boxed subframe, mortised and tenonned, glued and screwed, for concealed attachment of countertop and for cabinet rigidity.
 - l. Provide toe space on floor-mounted units.
 - m. For tall units and wall-mounted cabinets, include 5/8 inch x 3 inch concealed wood strips full length at top and bottom, for screw or bolt anchorage to wall to conform to pull requirements of Title 24.
 - n. Holes for Shelf Support Clips: 32mm on center.

MANUFACTURED PLASTIC-LAMINATE-CLAD CASEWORK
SECTION 12 3216
3595001

- 1) Provide 2 holes on each side of shelf except provide a 3rd hole where cabinets are deeper than 24 inches.
 - 2) Locations shall be confirmed with Architect.
 - o. The fabrication of casework must allow for shim space at the base of the cabinets, to account for field conditions, as required so that the height from finish floor to top of counter, and sink rim where occurs, does not exceed the specified height at any location along the countertop after installation.
 - 2. Finishing:
 - a. Exposed Interior Surfaces and Semi-Exposed Surfaces:
 - 1) Melamine bonded to MDF core; specified TFM panel.
 - 2) Use for all semi-exposed surfaces, tops and bottoms of wall-hung and tall cabinets except as otherwise specified, concealed ends, partitions, and drawer boxes.
 - 3) See "Shelves" Paragraph for panel and finish requirements for shelving.
- B. Drawers:
- 1. Fabrication:
 - a. Fabricate and assemble drawer boxes with subfront and back glued and screwed into tenons at drawer sides.
 - b. Fronts shall be 3/4 inch thick MDF.
 - c. Sides: 1/2 inch thick MDF to create drawer box subfront, sides, back and bottom.
 - d. Extend bottom into dados with glue and screws at all 4 edges, using 1/4-inch materials matching the sides and backs.
 - e. At drawers over 30 inches wide, provide 1/2-inch bottoms.
 - f. Install 2-drawer guides for each drawer with positive closing and stop device to prevent inadvertent removal.
 - g. Drawer boxes to be full height of drawer opening.
 - h. Attach drawer front to subfront with #8 x 1-inch pan head wood screws (P.H.W.S.)
 - i. Provide closing stops at the rear of both drawer sides, unless stops are built into the slides to prevent the drawer front from impacting the cabinet body.
 - 2. Finishing:
 - a. Drawer Front: Vertical grade high-pressure laminate (HPL).
 - b. Interior Face of Drawer Front: Cabinet liner.
 - c. Band all 4 edges of drawer front with specified banding material.
 - d. Provide TFM panel with melamine finish on both faces, for subfront, sides, back and bottom.
- C. Doors:
- 1. Fabrication:
 - a. Panel: 3/4-inch thick MDF.

MANUFACTURED PLASTIC-LAMINATE-CLAD CASEWORK
SECTION 12 3216
3595001

- b. Hang face-mounted over cabinet, pairs parallel with proper clearance at pull edges. Install hardware.
 - c. Clearance Tolerances: Develop 1/8 inch maximum reveals.
 - 2. Finishing:
 - a. Exposed Exterior Face: Specified HPL.
 - 1) Where wood grain pattern is selected, provide pairs of doors with book-match wood grain patterns.
 - b. Exposed Interior Face: Cabinet liner.
 - c. Band all 4 edges of doors with specified banding material.
- D. Shelves:
 - 1. Fabrication - General:
 - a. Shelving to be adjustable on 1-1/4 inch centers supported by 4 adjustable shelf clips.
 - b. Loading capacity to be minimum 50 pounds per square foot, not to exceed 200 pounds on any shelf.
 - c. Shelving shall match the interior depth of the cabinet box.
 - d. Band all leading edges with edge banding material as specified.
 - 2. Shelving less than 24 inches: 3/4-inch MDF.
 - a. Finish: Melamine, both sides.
 - 3. Shelving 24 to 30 inches: 1-inch MDF.
 - a. Finish: Melamine, both sides.
 - 4. Shelving Greater than 30 inches, up to 36 inches: 1-inch, MDF.
 - a. Finish: Vertical grade HPL, both sides, applied with rigid glue line process.
 - 5. Shelving Greater than 36 inches, up to 48 inches: 1-inch plywood.
 - a. Finish: Vertical grade HPL, both sides, applied with rigid glue line process. Contact adhesive is not permitted.
- E. Scribes and Filler Panels:
 - 1. Provide matching scribes and filler panels, and scribe all cabinets to abutting walls, partitions and ceilings.
 - 2. Scribes shall not exceed 1-1/2 inches wide.
 - 3. Scribe to be covered top and bottom.
 - 4. At locations where casework wraps inside corners, provide top and bottom filler panels where voids occur.
- F. Cabinet Bases:
 - 1. If casework manufacturer chooses to use cabinet bases, they shall be 4 inches standard height.
 - 2. Fabricate completely out of 3/4-inch plywood in continuous lengths to insure straight and level installation of cabinet bodies. MDF is not acceptable for use at bases.

3. Freestanding cabinets shall have cabinet ends running directly to the floor.
4. Anchorage fasteners to be neatly installed through the back and anchor strip at the top and bottom, and middle at tall cabinets.

2.9 COORDINATION WITH APPLIANCES

- A. Contractor shall have casework manufacturer review all locations where appliances are to be installed and coordinate dimensions to ensure the correct size openings are provided.
 1. Shop drawings shall clearly indicate locations and opening dimensions.
 2. Where appliances are not in contract, shop drawings shall request confirmation of critical dimensions.
- B. Adjustments that need to be made to the casework due to appliances not fitting correctly are to be done at no additional cost to the Project.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Prior to installing casework, examine and verify that the installed work of all other trades is complete to the point where this work may properly commence.
- B. Verify that specified items may be installed in accordance with the approved design.
- C. Review in job conditions, installation requirements, and quality of completed substrate for compliance with Architect's expectations related to floor flatness for installation of casework.
- D. In the event of discrepancy, immediately notify the Architect. Do not proceed in discrepant areas until discrepancies have been fully resolved.

3.2 PREPARATION

- A. Take all necessary measurements in the field to ensure proper dimensions for cabinets prior to fabrication.
- B. Coordinate with other trades whose work adjoins, combines, or aligns with casework.
- C. Where substrate is not in compliance with Architect's expectations related to floor flatness for installation of casework, and where excessive shimming to meet these expectations would be required, level substrate using latex-modified, portland cement based or blended hydraulic-cement-based formulation as specified in Section 03 5416, Hydraulic Cement Underlayment.

3.3 INSTALLATION

- A. Install all work in conformance with the referenced NAAWS document.

MANUFACTURED PLASTIC-LAMINATE-CLAD CASEWORK

SECTION 12 3216

3595001

- B. Supervision: Installation work shall be under direct supervision of representative of manufacturer of the casework.
- C. Set work level, square and in true alignment. Cabinetwork shall fit to walls and upon completion of installation shall show no marks, indentations or other defects. Furnish scribes, filler panels, trim and molding required for finished installation. When set, each individual cabinet shall be capable of withstanding, without movement, a force of 200 pounds applied in any direction.
- D. Cabinet work shall be installed as required so that the height from finish floor to top of counter, and sink rim where occurs, does not exceed the specified height at any location along the countertop after installation.
- E. Method of attachment, including the type, size, frequency and/or spacing of anchoring devices and fasteners shall comply to NAAWS minimum requirements or be as indicated on the Drawings or as specified, whichever is more restrictive.
- F. Doors, drawers and fixtures shall operate correctly and smoothly.
- G. Furnish miscellaneous metal support and bracing required for installation. If necessary, deliver these items to other trades responsible for installation into adjacent work and designate exact location for their installation.
- H. Provide specified seismic restraining, adjustable shelf supports at all adjustable shelves to prevent shelf from sliding out of cabinets with or without doors.

3.4 ADJUSTING AND CLEANING

- A. Prior to final inspection and acceptance by the Architect, completely check each installed item and adjust for proper operation.
- B. Remove all fingerprints, smudges and the like from casework; vacuum clean drawers and interiors of dust, dirt and sawdust.

3.5 PROTECTION

- A. Protect work and materials of this Section prior to and during installation and protect the installed work and materials of other trades. Adjust all moving or operating parts to function smoothly and correctly.
- B. In the event of damage, make all repairs and replacements necessary to the approval of the Architect at no additional cost to the Owner.

END OF SECTION

*p:\sacramento\3595 tracy unified school district\001-000_villalovoz es new shade structures\08 specifications\06 spec\04 final\jacobson\12 3216_manufactured plastic-laminate-clad casework.docx
Last Updated: November 1, 2021*

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Plastic laminate faced counters and splashes.

1.2 RELATED REQUIREMENTS

- A. Section 01 6116, Volatile Organic Compound (VOC) Restrictions, for VOC limits pertaining to adhesives, sealants, fillers, primers, and coatings.
- B. Section 01 8113, Sustainable Design Requirements, for CAL-Green general requirements and procedures.
- C. Section 06 4023, Interior Architectural Woodwork.
- D. Section 07 9200, Joint Sealants.
- E. Section 12 3216, Manufactured Plastic-Laminate-Clad Casework; casework to receive countertops.
- F. Division 26, Electrical, for electrical outlets and fittings built into countertops.

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CAL Green), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- C. American National Standards Institute (ANSI):
 - 1. A161.2: Decorative Laminate Countertops, Performance Standards for Fabricated High Pressure.
 - 2. A208.1: Particleboard.
 - 3. A208.2: Medium Density Fiberboard (MDF) for Interior Applications.
- D. International Organization for Standardization (ISO):
 - 1. 4586-2: "High-pressure decorative laminates (HPL, HPDL) - Sheets based on thermosetting resins (usually called laminates) - Part 2: Determination of properties."
- E. Woodwork Institute (WI): North American Architectural Woodwork Standards (NAAWS) published jointly by WI and the Architectural Woodwork Manufacturers of Canada (AWMAC).

PLASTIC-LAMINATE-CLAD COUNTERTOPS
SECTION 12 3623
3595001

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Submittal Procedures:
 - 1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
 - 2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
 - 3. Sustainable Design Submittals shall comply with the additional requirement of Section 01 8113, Sustainable Design Requirements.

1.5 ACTION SUBMITTALS

- A. Shop Drawings: Prepare for each countertop in accordance with Section 1 Article entitled "Submittals" of the referenced NAAWS document.
 - 1. Show items interfacing with countertops including relationship to supporting casework.
 - 2. Identify materials to be used.
 - 3. Shop drawings for countertops may be submitted as part of shop drawings prepared and submitted under Section 12 3216, Manufactured Plastic-Laminate-Clad Casework.
- B. Samples: 8 by 10-inch piece of selected pattern and color of plastic laminate.

1.6 INFORMATIONAL SUBMITTALS

- A. Before delivery of countertops to jobsite, submit a WI "Certified Compliance Certificate" listing the items certified, the applicable NAAWS Grade, and whether installation is included.
- B. Sustainable Design:
 - 1. General:
 - a. Submit information necessary to establish and document compliance with the California Green Building Standards Code.
 - b. Sustainable design submittals are in addition to other submittals.
 - 2. The following information shall be provided:
 - a. Adhesives and Sealants: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.
 - b. Composite Wood: Evidence of compliance that products meet formaldehyde limits of current CARB Airborne Toxic Control Measure (ATCM) as specified in Section 01 6116.
- C. Qualification Data: For fabricator.

1.7 CLOSEOUT SUBMITTALS

- A. Guarantee: Submit extended Contractor guarantee.

1.8 MAINTENANCE MATERIAL SUBMITTALS

- A. Grommets: 5 of each Type.

1.9 QUALITY ASSURANCE

- A. Fabricator Qualifications: Active member of WI. Other fabricators will be considered for approval upon submission of at least 5 years of verifiable evidence of experience in successful completion of work similar to work of this Project. This provision does not waive compliance with specified WI certification.
- B. Standard for Materials and Workmanship:
 - 1. Comply with the applicable requirements of Section 11 - Countertops of the "North American Architectural Woodwork Standards (NAAWS)" published jointly by WI and AWMAC. (hereinafter referred to as "woodworking standard").
 - 2. Where Contract Documents indicate requirements that conflict with or augment the woodworking standard, comply with the conflicting or augmenting requirements.
- C. Materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.
- D. Proof of compliance with the specified NAAWS Grade assembly and installation shall be provided by the following WI Quality Control Program:
 - 1. WI Monitored Compliance Program.
 - a. All countertops and the installation thereof for this project shall be directly monitored for compliance to the Contract by the Woodwork Institute under the scope of their Monitored Compliance Program (MCP).
 - 1) Inspections are to be performed at the beginning of fabrication, at the time of delivery to the job, at the beginning of installation, at completion of installation.
 - 2) Further information on the WI Monitored Compliance Program's Policies and Procedures are available directly from the Woodwork Institute, 916-372-9943.
 - 3) The WI MCP Registration Number shall be referenced in all communication.
 - b. Fees charged by the Woodwork Institute for their monitored compliance service are the responsibility of the Contractor and shall be included in the Contract sum.
 - c. Countertops and/or installation determined to be non-compliant by WI and not corrected will be rejected.
 - d. Issuance of the WI Monitored Compliance Certificate is a prerequisite of the Owner's final acceptance.

PLASTIC-LAMINATE-CLAD COUNTERTOPS
SECTION 12 3623
3595001

1.10 DELIVERY, STORAGE, AND HANDLING

- A. Do not deliver products until wet work, painting, and similar operations in storage and installation areas that could damage or soil work have been completed.
- B. Protect products during transit, delivery, storage, and handling so as to prevent damage, soiling, and deterioration.
- C. Store countertops only in areas where ambient conditions required can be and are maintained.
- D. Coordinate delivery with fabrication and installation of casework.

1.11 FIELD CONDITIONS

- A. Products shall be available at project when required for installation so as not to delay job progress. Contractor shall have its installer for these products cooperate with installers performing work under other Sections involved to effect proper installation.
- B. Environmental Limitations: Do not deliver or install countertops until building is enclosed, wet-work is complete, and HVAC system is operating and maintaining temperature and relative humidity at levels planned for building occupants during the remainder of the construction period.
- C. Field Measurements: Where countertops are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication and indicate measurements on shop drawings.

1.12 GUARANTEE

- A. Contractor: In addition to its standard Guarantee under the Contract, furnish Owner a special extended written 5-year guarantee, cosigned by installer, agreeing to repair or replace plastic-laminate-clad countertops that fail to perform as required within guarantee period as a result of failure of materials or installation workmanship at no additional cost to the Owner.

PART 2 - PRODUCTS

2.1 DESIGN AND PERFORMANCE CRITERIA

- A. Sustainable Design:
 - 1. VOC emissions for field-applied adhesives, sealants, and sealant primers must comply with limits specified in Section 01 6116.
 - 2. Composite wood products must meet current formaldehyde emission limits of CARB Airborne Toxic Control Measure (ATCM) as specified in Section 01 6116.

2.2 PANEL MATERIALS

- A. Medium-Density Fiberboard (MDF): ANSI A208.2, Grade 155, formaldehyde free. 3/4 inch thick unless otherwise indicated.

1. Typical Locations: Meeting grade MR30 moisture resistance; "Medite II," by Roseburg, or equal.
 2. At Sinks and Adjoining Countertops on Same Wall: Meeting grade MR50 moisture resistance; "Medex," by Roseburg, or equal.
- B. Particleboard: Not permitted.

2.3 LAMINATE MATERIALS

- A. High-Pressure Plastic Laminate: Conforming to ISO 4586-2.
- B. Grades:
1. Horizontal Surfaces and Backsplash: ISO 10/HGS; horizontal, general purpose.
 2. Postforming: ISO 12/HGP; horizontal, general purpose, postformable.
 3. Backing Sheet: ISO 91/BKL; backer, light duty.
- C. Manufacturers: Formica, Wilsonart, Arborite, Pionite, Nevamar, or equal.
- D. Colors, and Patterns: As selected by Architect from manufacturer/suppliers' full product color range.
1. There will be no additional cost allowance for premium color selections, or for selection of different colors for different rooms up to a maximum 6 colors.

2.4 ACCESSORIES

- A. Edge Treatment: Same as laminate cladding on horizontal surfaces.
- B. Grommets: Doug Mockett & Co. Inc., Manhattan Beach, CA, 310-318-2491, or equal.
1. Type: SG Series, or EDP Series; coordinate data connection requirements with Owner.
 2. Material and Color: As selected by Architect.
- C. Countertop Braces: A&M Brace as manufactured by A & M Hardware, Inc. or equal.
1. Size brace appropriate with size of countertop.
 2. Provide Häfele "Hebgo" (1100 lb. capacity) bracket, or equal at locations where continuous raceway runs directly below countertop brace.
 3. Provide largest brace available for given countertop depth to achieve maximum countertop support.
 4. Color: As selected by Architect from full range of manufacturer's standard colors. Multiple colors may be selected.
- D. Fasteners: Type and size as required.
- E. Adhesives: VOC compliant and passing NAAWS "Heat Resistance Test.". Do not use adhesives that contain urea formaldehyde.

PLASTIC-LAMINATE-CLAD COUNTERTOPS
SECTION 12 3623
3595001

2.5 FABRICATION

- A. General:
 - 1. Obtain field measurements, and verify dimensions before fabricating work.
 - 2. Comply with NAAWS Custom Grade requirements and ANSI A161.2.
- B. Core Material: Specified MDF.
- C. Fabricate to dimensions, profiles, and details shown.
- D. Build up countertop thickness to 1-1/2 inches at front, back, and ends with additional layers of core material laminated to top.
- E. Provide specified backing sheet at configurations and installation conditions recommended in the woodworking standard.
- F. All other Countertops: Provide roll-form 180-degree edge.
- G. Unless otherwise shown, round projecting or outside corners with 3/4-inch minimum radius or clip 45-degree angle corner.
- H. Provide joints only where maximum available lengths or countertop configuration requires a joint and where interfacing with existing. Where joints are required, balance and center. Make joints neat, flush and watertight.
- I. To greatest extent possible, complete fabrication and assembly before shipment to site.
 - 1. Disassemble components only as necessary for shipment and installation.
 - 2. Where necessary for fitting at site, provide extra borders and edges so as to allow scribing and trimming to fit.
- J. Precut openings for applied fixtures and fitting, where possible. Field cuts shall be performed by the fabricator.
- K. Conceal all fasteners.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Verify that backing has been installed at appropriate locations for anchorage.
- B. Examine shop-fabricated work for completion. Complete work as required.

3.2 INSTALLATION

- A. Install countertops in accordance with Section 11 of the NAAWS and requirements shown on the Drawings.

PLASTIC-LAMINATE-CLAD COUNTERTOPS

SECTION 12 3623

3595001

- B. Install countertops and backsplashes with concealed fastenings, securely attaching to cabinet bases or countertop braces / brackets at 36 inches on center maximum. Scribe neatly to walls or other adjoining surfaces.
- C. Make joints neatly, with uniform appearance.
- D. Install work plumb, level, true, and straight, with no distortions. Install with no variation in flushness of adjoining surfaces.
- E. Countertops shall be installed as required so that the height from finish floor to top of counter, and sink rim where occurs, does not exceed the specified height at any location along the countertop after installation.
- F. Shim as required, using concealed shims.
- G. Sealant: Install sealant as specified in Section 07 9200, Joint Sealants, to close small unavoidable gaps between counter and abutting surfaces, and at sinks. Sealant shall not be a substitute for tightly scribed work.
- H. Install, at no additional charge, extra stock grommets where directed by Owner following completion of countertop installation.

END OF SECTION

p:\sacramento\3595 tracy unified school district\001-000_villalovoz es new shade structures\08 specifications\06 spec\04 final\jacobson\12 3623_plastic-laminate-clad countertops.docx
Last Updated: November 12, 2021

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes
 - 1. This section describes the basic requirements for the electrical work on this project.

1.2 REFERENCES

- A. National Electrical Contractors Association (NECA): Standard of Installation
- B. National Fire Protection Association (NFPA): 70E
- C. National Safety Council (NSC)
- D. Occupational Safety and Health Administration (OSHA)

1.3 SUBMITTALS

- A. Product Data
- B. Operation and Maintenance (O&M) Manuals
- C. Field Test Reports

1.4 QUALITY ASSURANCE

- A. Reference to Codes, Standards, Specifications and recommendations of technical societies, trade organizations and governmental agencies shall mean that latest edition of such publications adopted and published prior to submittal of the bid. Such codes or standards shall be considered a part of this Specification as though fully repeated herein.
- B. When codes, standards, regulations, etc. allow Work of lesser quality or extent than is specified under this Division, nothing in said codes shall be construed or inferred authority for reducing the quality, requirements, or extent of the Contract Documents. The Contract Documents address the minimum requirements for construction.
- C. Work shall be performed in accordance with all applicable requirements of the edition indicated on the drawings of all governing codes, rules and regulations including but not limited to the following minimum standards, whether statutory or not:
 - 1. California Electric Code (CEC)
 - 2. California Building Code (CBC)
 - 3. California Green Building Code (CGC)
 - 4. California Fire Code (CFC)

ELECTRICAL BASIC REQUIREMENTS

SECTION 26 0100

3595001000

5. California Energy Code (CENC)
 6. California Mechanical Code (CMC)
 7. California Plumbing Code (CPC)
- D. Standards: Equipment and materials specified under this Division shall conform to the following standards where applicable:
1. ACI American Concrete Institute
 2. ANSI American National Standards Institute
 3. ASTM American Society for Testing Materials
 4. CBM Certified Ballast Manufacturers
 5. ETL Electrical Testing Laboratories
 6. FS Federal Specification
 7. IEEE Institute of Electrical and Electronics Engineers, Inc.
 8. IPCEA Insulated Power Cable Engineer Association
 9. NEMA National Electrical Manufacturer's Association
 10. UL Underwriters' Laboratories
- E. Independent Testing Agency qualifications:
1. Testing Agency shall be an independent testing organization that will function as an unbiased authority, professionally independent of Manufacturer, Supplier and Contractor, furnishing and installing equipment or system evaluated by Testing Agency.
 2. Testing Agency shall be regularly engaged in the testing of electrical equipment, devices, installations, and systems.
 3. Testing Agency shall meet Federal Occupational Safety and Health Administration (OSHA) requirements for accreditation of independent testing laboratories, Title 9, Part 1907.
 4. On-site technical personnel shall be currently certified by the International Electrical Testing Association in electrical power distribution system testing.
 5. Testing Agency shall use technicians who are regularly employed by the firm for testing services.
 6. Contractor shall submit proof of above Testing Agency qualifications with bid documentation upon request.
- F. All base material shall be ASTM and/or ANSI standards.
- G. All electrical apparatus furnished under this Section shall conform to NEMA standards and the NEC and bear the UL label where such label is applicable.
- H. Certify that each welder performing Work has satisfactorily passed AWS qualification tests for welding processes involved and, if pertinent, has undergone re-certification.

PART 2 - PRODUCTS

- A. SEE SCHEDULES ON ELECTRICAL PLANS and other Division 26 sections

PART 3 – EXECUTION

3.1 ROUGH-IN

- A. Contractor shall verify lines, levels and dimensions indicated on the construction document drawings and shall be responsible for the accuracy of the setting out of Work and for its strict conformance with existing conditions at the Project site.
- B. Verify final locations for rough-ins with field measurements and with the requirements for the actual equipment to be connected.
- C. Refer to equipment specifications in other sections for equipment rough-in requirements.

3.3 INSTALLATION

- A. Preparation, sequencing, handling, and installation shall be in accordance with Manufacturer's written instructions and technical data particular to the product specified and/or accepted equal except as otherwise specified.
- B. Comply with Shop Drawings prepared by Manufacturer.
- C. Verify all dimensions by field measurements.
- D. Arrange for chases, slots, and openings in other building components during progress of construction, to allow for electrical installations.
- E. Coordinate the installation of required supporting devices and sleeves to be set in poured-in-place concrete and other structural components, as they are constructed.
- F. Sequence, coordinate and integrate installations of electrical materials and equipment for efficient flow of the Work. Give particular attention to large equipment requiring positioning prior to closing in the building.
- G. Where mounting height is not detailed or dimensioned, contact the Architect for direction prior to proceeding with rough-in.
- H. Coordinate connection of electrical systems with exterior underground and overhead utilities and services. Comply with requirements of governing regulations, franchised service companies and controlling agencies. Provide required connection for each service.
- I. Install systems, materials, and equipment to conform with approved submittal data, including coordination drawings, to greatest extent possible. Conform to arrangements indicated by the construction documents, recognizing that portions of the Work are indicated only in diagrammatic form. Where coordination requirements conflict with individual system requirements, refer conflict to the Architect.

ELECTRICAL BASIC REQUIREMENTS

SECTION 26 0100

3595001000

- J. Install systems, materials, and equipment level and plumb, parallel and perpendicular to other building systems and components, where installed exposed in finished spaces.
- K. Install electrical equipment to facilitate servicing, maintenance and repair or replacement of equipment components. As much as practical, connect equipment for ease of disconnecting, with minimum of interference with other installations.
- L. Coordinate electrical systems, equipment, and materials installations with other building components.
- M. Provide access panel or doors where devices or equipment are concealed behind finished surfaces.
- N. Install systems, materials and equipment giving right-of-way priority to other systems that are required to maintain a specified slope.
- O. Conform to the National Electrical Contractors' Association "Standard of Installation" for general installation practice.

3.3 CUTTING, PATCHING, PAINTING, AND SEALING

- A. Structural members shall in no case be drilled, bored, or notched in such a manner that will impair their structural value. Cutting of holes, if required, shall be done with core drill and only with the approval of the Architect and Structural Engineer.
- B. Protection of Installed Work: During cutting and patching operations, protect adjacent installations.
- C. Application of joint sealers:
 - 1. General: Comply with joint sealer Manufacturers' printed application instructions applicable to products and applications indicated, except where more stringent requirements apply.
 - 2. Installation of fire-stopping sealant: Install sealant, including forming, packing and other accessory materials, to fill openings around electrical services penetrating floors and walls, to provide fire-stops and fire-resistance ratings indicated for floor or wall assembly in which penetration occurs. Comply with installation requirements established by testing and inspecting agency.

3.4 FIELD QUALITY CONTROL

- A. General testing requirements:
 - 1. The purpose of testing is to ensure that all tested electrical equipment, both Contractor and Owner supplied, is operational and within industry and Manufacturer's tolerances and is installed in accordance with design Specifications.

ELECTRICAL BASIC REQUIREMENTS
SECTION 26 0100
3595001000

2. Tests and inspections shall determine suitability for energization.
 3. Perform tests in presence of the Owner's Representative and furnish test equipment, facilities and technical personnel required to perform tests.
 4. Tests shall be conducted during the construction period and at completion to determine conformity with applicable codes and with these Specifications.
- B. Tests: In addition to specific system test described elsewhere, tests shall include:
1. Equipment operations: Test motors for correct operation and rotation.
 2. Lighting control circuits: Test lighting circuits for correct operation through their control devices.
 3. Alarm and interlock systems: Produce malfunction symptoms in operating systems to test alarm and interlock systems. In addition, all specific tests described in the fire alarm system shall be performed.
 4. Circuit numbering verification: Select on a random basis various circuit breakers in the panelboards and cycle them on and off to verify compliance of the typed panel directories with actual field wiring.
 5. Voltage check:
 - a. At completion of job, check voltage at several points of utilization on the system that has been installed under this Contract. During test, energize all installed loads.
 - b. Adjust taps on transformers to give proper voltage, which is 118 to 122 volts for 120 volt nominal systems and proportionately equivalent for higher voltage systems. If proper voltage cannot be obtained, inform the Owner and the serving Utility Company.
- C. Contractor shall provide test power required when testing equipment before service energization and coordinate availability of test power with General Contractor after service energization. The Contractor shall provide any specialized test power as needed or specified herein.
- D. Testing safety and precautions:
1. Safety practices shall include the following requirements:
 - a. Applicable State and Local safety operating procedures.
 - b. OSHA
 - c. NSC
 - d. NFPA 70E
 2. All tests shall be performed with apparatus de-energized and grounded except where otherwise specifically required ungrounded by test procedure.
- E. Calibration of test equipment:
1. Testing Agency shall have calibration program that assures test instruments are maintained within rated accuracy.
 2. Instruments shall be calibrated in accordance with the following frequency schedule:
 - a. Field instruments: Analog, 6 month maximum; Digital, 12 months

ELECTRICAL BASIC REQUIREMENTS

SECTION 26 0100

3595001000

- maximum.
- b. Laboratory instruments: 12 months.
- c. Leased specialty equipment: 12 months where accuracy is guaranteed by lessor.
- 3. Dated calibration labels shall be visible on test equipment.
- 4. Records, which show date and results of instruments calibrated or tested, must be kept up-to-date.
- 5. Up-to-date instrument calibration instructions and procedures shall be maintained for test instrument.
- 6. Calibration standards shall be of higher accuracy than instrument tested.
- 7. Equipment used for field testing shall be more accurate than instrument being tested.
- F. Coordinate with General Contractor regarding testing schedule and availability of equipment ready for testing.
- G. Notify Owner one week in advance of any testing.
- H. Any products which fail during the tests or are ruled unsatisfactory by the Owner's Representative shall be replaced, repaired, or corrected as prescribed by the Owner's Representative at the expense of the Contractor. Tests shall be performed after repairs, replacements or corrections until satisfactory performance is demonstrated.
- I. Testing Agency shall maintain written record of tests and shall assemble and certify final test report. All test results/reports shall be submitted to the Electrical Engineer for review.
- J. Include all test results in the maintenance manuals.

3.5 CLEANING

- A. Prior to energizing of electrical equipment, the Contractor shall thoroughly clean the interior of enclosures from construction debris, scrap wire, etc. using Manufacturer's approved methods and materials.
- B. Upon completion of Project, prior to final acceptance, the Contractor shall thoroughly clean both the interior and exterior of all electrical equipment per Manufacturers approved methods and materials. Remove paint splatters and other spots, dirt, and debris.
- C. Touch-up paint any marks, blemishes or other finish damage suffered during installation.

- END OF SECTION -

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes conduit, surface raceways, J-hooks, wireways, outlet boxes, pull and junction boxes, concrete pullboxes and vaults, floor boxes.

1.2 REFERENCES

1.3 AMERICAN NATIONAL STANDARDS INSTITUTE:

- A. ANSI C80.1 - Rigid Steel Conduit, Zinc Coated.
- B. ANSI C80.3 - Specification for Electrical Metallic Tubing, Zinc Coated.

1.4 NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION:

- A. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum).
- B. NEMA FB 1 - Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit and Cable Assemblies.
- C. NEMA OS 1 - Sheet Steel Outlet Boxes, Device Boxes, Covers, and Box Supports.
- D. NEMA OS 2 - Nonmetallic Outlet Boxes, Device Boxes, Covers, and Box Supports.
- E. NEMA RN 1 - Polyvinyl Chloride (PVC) Externally Coated Galvanized Rigid Steel Conduit and Intermediate Metal Conduit.
- F. NEMA TC 2 - Electrical Polyvinyl Chloride (PVC) Tubing and Conduit.
- G. NEMA TC 3 - PVC Fittings for Use with Rigid PVC Conduit and Tubing.

1.5 SYSTEM DESCRIPTION

- A. Raceway and boxes located as indicated on Drawings, and at other locations required for splices, taps, wire pulling, equipment connections, and compliance with regulatory requirements. Raceway and boxes are shown in approximate locations unless dimensioned. Provide raceway to complete wiring system.
- B. All wiring shall be installed in raceway.
- C. Provide raceway as follows:
 - 1. Underground: Provide thickwall nonmetallic conduit. Provide cast metal boxes or nonmetallic handhole.
 - 2. In Slab Above Grade: Not permitted.
 - 3. Below Slab on Grade: Use thickwall nonmetallic conduit. Terminate with coated rigid steel elbows and short length of coated rigid steel conduit out of concrete.

RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

SECTION 26 0533

3595001000

4. Outdoor Locations, Above Grade: Provide galvanized rigid steel conduit. Provide cast metal outlet, pull, and junction boxes.
5. Wet and Damp Locations: Provide galvanized rigid steel conduit. Provide cast metal outlet, junction, and pull boxes. Provide flush mounting outlet box in finished areas.
6. Concealed Dry Locations: Provide electrical metallic tubing. Provide sheet-metal boxes. Provide flush mounting outlet box in finished areas. Provide hinged enclosure for large pull boxes where shown on drawings. Provide J-hooks when shown on plans.
7. Exposed Interior Dry Locations: Use rigid steel conduit or intermediate metal conduit below eight feet or where subject to damage. Use rigid steel conduit, intermediate metal conduit, or electrical metallic tubing above eight feet or in electrical, mechanical or telecommunication rooms. Use sheet-metal or cast metal boxes. Use flush mounting outlet box in finished areas. Provide hinged enclosure for large pull boxes.

1.6 DESIGN REQUIREMENTS

- A. Minimum Raceway Size: 0.75 inch unless otherwise specified.
- B. Minimum Raceway Size for Data Communications: 1.00 inch unless otherwise specified.
- C. Minimum Raceway Size for Telecommunications: 1.00 inch unless otherwise specified.
- D. Minimum Raceway Size for AV Systems: 1.00 inch unless otherwise specified.

1.7 CLOSEOUT SUBMITTALS

- A. Project Record Documents:
 1. Record actual routing of conduits larger than 2 inches.
 2. Record actual locations and mounting heights of outlet, pull, and junction boxes.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Protect conduit from corrosion and entrance of debris by storing above grade. Provide appropriate covering.
- B. Protect PVC conduit from sunlight.

1.9 COORDINATION

- A. Coordinate mounting heights, orientation and locations of outlets mounted above counters, benches, and backsplashes.
- B. Coordinate Work of this Division and Work of other Divisions in advance of installation. Provide additional Work to overcome tight conditions at no increase in Contract Sum.
- C. Coordinate installation of outlet boxes for equipment specified in other divisions.

PART 2 - PRODUCTS

2.1 METAL CONDUIT

- A. Rigid Steel Conduit: ANSI C80.1.
- B. Rigid Aluminum Conduit: ANSI C80.5.
- C. Intermediate Metal Conduit (IMC): Rigid steel.
- D. Fittings and Conduit Bodies: NEMA FB 1. Fittings shall be steel/malleable iron with threaded fittings. Use insulated metallic bushings with lug where ground connections are required. Use plastic bushing for non-bonding applications.

2.2 PVC COATED METAL CONDUIT

- A. Product Description: NEMA RN 1; rigid steel conduit with external PVC coating, 40 mil thick.
- B. Fittings and Conduit Bodies: NEMA FB 1; steel fittings with external PVC coating to match conduit.

2.3 FLEXIBLE METAL CONDUIT

- A. Product Description: Interlocked steel construction.
- B. Fittings: NEMA FB 1.

2.4 LIQUIDTIGHT FLEXIBLE METAL CONDUIT

- A. Product Description: Interlocked steel construction with PVC jacket.
- B. Fittings: NEMA FB 1.

2.5 ELECTRICAL METALLIC TUBING (EMT)

- A. Product Description: ANSI C80.3; galvanized tubing.
- B. Fittings and Conduit Bodies: NEMA FB 1; steel couplings and connectors. Box connectors shall have with insulated throat. Set screw type couplings.

2.6 NONMETALLIC CONDUIT

- A. Product Description: NEMA TC 2; Schedule 40 PVC.
- B. Fittings and Conduit Bodies: NEMA TC 3.

2.7 SURFACE RACEWAY (WIREMOLD)

- A. Product Description: Surface raceway as shown on plans. Raceway shall be Wiremold or equal.

RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

SECTION 26 0533

3595001000

- B. Fittings: Provide all supports, adapters, clips, elbows, covers, device fittings, and other hardware as required for a complete installation. Provide B-Line "transition" boxes to clear offset surfaces. Supports shall be concealed, exposed straps are not allowed.
- C. Finish:
 - 1. Steel raceway and associated transition boxes and exposed hardware shall be spray painted with two coats of semi-gloss acrylic enamel paint, color as directed by Architect.
 - 2. Aluminum raceway shall be provided with factory finish, color as directed by Architect. Transition boxes shall be spray painted with two coats of semi-gloss acrylic enamel paint, color as directed by Architect.
 - 3. Plastic raceway shall be provided with factory finish, color as directed by Architect. Transition boxes shall be spray painted with two coats of semi-gloss acrylic enamel paint, color as directed by Architect.
 - 4. Coordinate all colors with Architect prior to ordering.

2.8 J-HOOKS

- A. Product Description: Low voltage signal cable J-Hooks shall be Panduit. Provide with support device for construction encountered.

2.9 WIREWAY

- A. Product Description: General purpose for indoor applications and raintight type for outdoor locations wire way.
- B. Knockouts: Manufacturer's standard.
- C. Cover: Hinged cover with full gaskets.
- D. Connector: Flanged.
- E. Fittings: Lay-in type with removable top, bottom, and side; captive screws and drip shield for outdoor.
- F. Finish: Rust inhibiting primer coating with gray enamel finish.

2.10 OUTLET BOXES

- A. All boxes shall be suitable for the environment in which they are installed.
- B. Sheet Metal Outlet Boxes: NEMA OS 1, galvanized steel.
 - 1. Luminaire and Equipment Supporting Boxes: Rated for weight of equipment supported; furnish 0.5-inch male fixture studs where required.
 - 2. Boxes for shall be 1.5-inch-deep by 4-inch square minimum for single devices.
 - 3. Boxes for shall be 1.5-inch-deep by 4-11/16 inch square minimum for two devices.
 - 4. Boxes for data and signal outlets shall be 2-1/8-inch-deep by 4-11/16-inch square minimum.
 - 5. Concrete Ceiling Boxes: Concrete type.

RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

SECTION 26 0533

3595001000

6. Provide rings as required.

- C. Cast Boxes: NEMA FB 1, Type FD, aluminum. Furnish gasketed cover by box manufacturer. Furnish threaded hubs.

2.11 BOX EXTENSIONS

- A. At rooms being remodeled and where existing walls are to receive new finish material, replace existing plaster rings with new rings.

2.12 PULL AND JUNCTION BOXES

- A. Boxes having an internal volume less than 100 cubic inches shall be as specified for outlet boxes. Boxes having internal volume greater than 100 cubic inches shall be of panelboard type construction except that covers shall be secured by screws or bolts.
- B. Boxes exposed to rain or installed in wet locations shall be specifically designed for the purpose.
- C. All boxes shall be installed so that covers are accessible after completion of the installation.
- D. Boxes shall not be installed in finished areas unless specific approval for such installation is granted by Architect.

2.13 CONCRETE PULLBOXES AND VAULTS

- A. Boxes: Boxes shall be precast, high density reinforced concrete. In areas of vehicular traffic, boxes shall be H20 rated.
- B. Extensions: Extensions shall be provided at each pullbox. Provide a minimum of (1) extension. Provide additional extension(s) as required to provide space in box for code required cable bending.
- C. Covers: Covers in concrete or asphalt shall be galvanized. In all other areas, covers shall be steel checker plate. In areas of vehicular traffic, lids shall be galvanized steel, H20 rated. All covers shall be provided with hold-down bolts.
- D. Floor: Provide poured concrete slab as detailed on plans. At H20 rated boxes, provide manufacturer's concrete slab.
- E. Size: Provide size as noted on plans. If size is not shown, provide boxes sized per codes.
- F. Labeling: Covers shall be factory marked as shown on plans.

2.14 FLUSH MULTI SERVICE FLOOR BOXES (4 PORT)

- A. Floor boxes shall be cast iron, fully adjustable, Walker RFB4-CI-1 with FPBTCAL cover. Provide brackets required to mount devices shown on plans. Provide blank plates at unused ports.

RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

SECTION 26 0533

3595001000

2.15 FLUSH MULTI SERVICE FLOOR BOXES (11 GANG):

- A. Floor boxes shall be steel, fully adjustable, Walker RFB11 with RFB119BTCAL cover. Provide brackets required to mount devices shown on plans. Provide blank plates at unused ports.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify outlet locations and routing and termination locations of raceway prior to rough-in.

3.2 EXISTING WORK

- A. Remove exposed abandoned raceway, including abandoned raceway above accessible ceiling finishes. Cut raceway flush with walls and floors, and patch surfaces.
- B. Remove concealed abandoned raceway to its source.
- C. Disconnect abandoned outlets and remove devices. Remove abandoned outlets when raceway is abandoned and removed. Install blank cover for abandoned outlets not removed.
- D. Maintain access to existing boxes and other installations remaining active and requiring access. Modify installation or provide access panel.
- E. Extend existing raceway and box installations using materials and methods [compatible with existing electrical installations, or] as specified.
- F. Clean and repair existing raceway and boxes to remain or to be reinstalled.
- G. At rooms being remodeled and where existing walls are to receive new finish material, replace existing plaster rings with new rings with depth required to bring box flush with new finish. Contractor shall review Architectural drawings prior to bid to note walls receiving new finishes (tackboards, sheetrock, etc.) and include the necessary work in bid.

3.3 INSTALLATION

- A. Ground and bond raceway and boxes.
- B. Fasten raceway and box supports to structure and finishes.
- C. Identify raceway and boxes.
- D. Arrange raceway and boxes to maintain headroom and present neat appearance.

3.4 INSTALLATION - RACEWAY

- A. Raceway routing is shown in approximate locations unless dimensioned. Route to complete wiring system.

RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

SECTION 26 0533

3595001000

- B. Unless otherwise specified, all raceway shall be installed concealed. Raceway may be run exposed on unfinished walls, in attic spaces, in electrical rooms and when routed to surface panels, cabinets or gutters.
- C. Arrange raceway supports to prevent misalignment during wiring installation.
- D. Support raceway using coated steel or malleable iron straps, lay-in adjustable hangers, clevis hangers, and split hangers.
- E. Group related raceway; support using conduit rack. Construct rack using steel channel and provide space on each for 25 percent additional raceways.
- F. Do not support raceway with wire or perforated pipe straps. Remove wire used for temporary supports
- G. Do not attach raceway to ceiling support wires or other piping systems.
- H. Construct wire way supports from steel channel.
- I. Route exposed raceway parallel and perpendicular to walls.
- J. Route raceway installed above accessible ceilings parallel and perpendicular to walls.
- K. Route conduit in and under slab from point-to-point.
- L. Maintain clearance between raceway and piping for maintenance purposes.
- M. Maintain 12-inch clearance between raceway and surfaces with temperatures exceeding 104 degrees F.
- N. Cut conduit square using saw or pipe cutter; de-burr cut ends.
- O. Bring conduit to shoulder of fittings; fasten securely.
- P. Join nonmetallic conduit using cement as recommended by manufacturer. Wipe nonmetallic conduit dry and clean before joining. Apply full even coat of cement to entire area inserted in fitting. Allow joint to cure for minimum 20 minutes.
- Q. Install conduit hubs to fasten conduit to sheet metal boxes in damp and wet locations and to cast boxes.
- R. Install no more than equivalent of three 90-degree bends between boxes. Install conduit bodies to make sharp changes in direction, as around beams. Install factory elbows for bends in metal conduit larger than 2-inch size.
- S. Avoid moisture traps; install junction box with drain fitting at low points in conduit system.
- T. Install fittings to accommodate expansion and deflection where raceway crosses seismic and expansion joints.
- U. Install suitable pull string or cord in each empty raceway except sleeves and nipples.

RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

SECTION 26 0533

3595001000

- V. Install suitable caps to protect installed conduit against entrance of dirt and moisture.
- W. Surface Raceway:
 - 1. Anchor raceway to structural members using screws. Supports shall be concealed. Space screws 24" maximum on center. Each run shall have a minimum of (2) screws.
 - 2. Mount plumb and level.
 - 3. Install insulating bushings and inserts at connections to outlets and corner fittings.
 - 4. Raceway shown on plans is schematic. Contractor shall coordinate exact routing and installation with building conditions and provide all parts, pieces, elbows, transition boxes and other items as required for a complete, closed and professionally installed installation.
 - 5. Coordinate exact routing with Architect prior to installation.
- X. J-Hooks:
 - 1. Provide J-hooks 48" maximum on center.
 - 2. All cable to be run parallel and perpendicular to building lines.
 - 3. Provide mounting hardware as required.
 - 4. Provide Unistrut channels between structural members as required.
 - 5. Provide 24" long 2" conduit sleeves through walls, draft stops, etc. Provide as many as necessary to accommodate cables in contract plus two extra capped at each end for future cabling. All conduits shall be provided with bushed ends.
- Y. Close ends and unused openings in wire way.

3.5 EXCAVATING AND TRENCHING:

- A. Perform all excavations as required for the installation of the work included under this Section, including shoring of earth banks to prevent cave-ins and to protect workmen and equipment.
- B. Restore all surfaces, roadways, walks, curbs, walls, existing underground installation, etc., damaged or cut as a result of the excavations to their original condition in a manner approved by the Architect.
- C. Stop machine excavation for trenches, in solid ground, several inches above required grade line, then trim trench bottom by hand to accurate grade so that a firm and uniform bearing throughout entire length of duct is provided. In lieu of above hand excavation in bottom of trench, Contractor may excavate to depth no less than 6" below required grade line and place a bed of sand or granular soil, properly compacted to provide a uniform grade and to provide a firm support for duct throughout its entire length.
- D. Minimum conduit depth of pipe crown shall be 2'0" below finished or natural grade, unless detailed otherwise on Drawings. Conduits under parking lots, roadways, driveways, fire truck access routes, and other areas subject to vehicular traffic shall be installed a minimum of 24" below grade.

3.6 BACKFILLING:

- A. No backfilling operations shall begin until the required tests and inspection has been made. Should any of the work be enclosed or covered up before it has been approved, Contractor shall, at his expense, uncover the work.
- B. After it has been inspected, tested, and approved, he shall make all repairs necessary to restore the work of other contractors to the condition in which it was found at the time of uncovering.
- C. Except under existing paved area, walks, roads, or similar surfaces, and in cases where rock is encountered, backfill more than 12" above the top of the pipe shall be made using suitable excavated material placed in 6" layers measured before compaction, and tamped by machine.
- D. Surface work shall be replaced to match the existing.
- E. Entire backfill for bored excavations under existing pavement, walks, roads, or similar surfaces, shall be made with clean sand compacted by flooding.
- F. The contractor shall install a marking tape 6" below grade and directly above all electrical conduits. The tape shall consist of a 4 mil insert plastic film specifically formulated for prolonged use underground. It shall be highly resistant to alkalis, acids and other destructive agents found in the soil. Tape shall have a minimum tensile strength of 20 lbs. per 3" with strips and a minimum elongation of 500%. Tape shall bear a continuous painted message repeated every 16" to 36" warning of the installation buried below. The message shall read "CAUTION – ELECTRICAL POWER LINE BURIED BELOW" or "CAUTION – ELECTRICAL SIGNAL LINES BURIED BELOW" as applies. Installation instruction for the tape shall be printed with each message along the entire length. The tape shall be as that manufactured by Reef Industries, Inc., or approved equal. For those installations involving non-metallic pipe, tape shall be aluminum foil encased in two layers of inert plastic film enabling the tape to be inductively located. Terre Tape "D" Warning Tapes are acceptable. When conduit below is plastic, tape shall have metallic content and shall respond to metal detectors. Do not exclude this. It will be required to verify the installation of this tape.

3.7 FLASHING AND SEALING:

- A. Flash and counterflash roof and wall penetrations in manner described under other applicable sections of this Specification and as approved by the Architect.
- B. Conduits, ducts, etc., passing through finished walls and ceilings shall be fitted with steel escutcheon plates, chrome or paint finish as directed.
- C. Conduits which penetrate floor slabs and concrete or masonry walls shall be grouted and sealed watertight at penetration.
- D. Conduits penetrating exterior walls other than concrete or masonry shall be sealed watertight with polyurethane sealant.

RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

SECTION 26 0533

3595001000

- E. Underground conduits stubbing up into a room shall be sealed around cables or pullstring with foam sealant.
- F. All flashing and sealing shall be provided by this Contractor.

3.8 INSTALLATION – BOXES

- A. Boxes shall be accurately placed as shown on Drawings or as close thereto as possible. Contractor shall refer to Drawings, specifications, and submittals covering work of the other trades to coordinate outlet location. In the event of conflict between planned locations of outlet and other equipment or furnishing, Contractor shall not proceed until direction has been given by Architect.
- B. Unless otherwise specified or shown on Drawings, boxes shall be flush mounted with front edge of box or ring flush with wall or ceiling finish. Use plaster ring of appropriate depth in plastered or gypboard applications. Contractor shall review architectural drawings and note wall and ceiling construction and finishes for each wall.
- C. Boxes shall not be installed back-to-back in walls. To prevent sound transfer, outlets, switches, etc. shown on opposing sides of the same wall shall be installed in separate stud spaces, except that outlets installed at different elevations may occupy the same stud space when box separation exceeds 18". Where these requirements cannot be met, Contractor shall provide insulation material between boxes.
- D. Orient boxes to accommodate wiring devices.
- E. Install pull boxes and junction boxes above accessible ceilings and in unfinished areas only.
- F. In Accessible Ceiling Areas: Install outlet and junction boxes no more than 6 inches from ceiling access panel or from removable recessed luminaire.
- G. Locate flush mounting box in masonry wall to require cutting of masonry unit corner only. Coordinate masonry cutting to achieve neat opening.
- H. Install stamped steel bridges to fasten flush mounting outlet box between studs.
- I. Install flush mounting box without damaging wall insulation or reducing its effectiveness.
- J. Install adjustable steel channel fasteners for hung ceiling outlet box.
- K. Do not fasten boxes to ceiling support wires or other piping systems.
- L. Support boxes independently of conduit.
- M. Install gang box where more than one device is mounted together. Do not use sectional box.
- N. Install gang box with plaster ring for single device outlets.

3.9 INSTALLATION CONCRETE PULLBOXES AND VAULTS

- A. Install boxes flush with finished grade or surface material.
- B. Install hold down bolts for all covers.
- C. Ground bond steel cover plate with insulated green grounding conductor.
- D. Grout between box and extension(s).
- E. Any box installed in areas of vehicular traffic shall be H20 rated. Contractor shall verify this requirement prior to ordering.

3.10 INTERFACE WITH OTHER PRODUCTS

- A. Install conduit to preserve fire resistance rating of partitions and other elements.
- B. Route conduit through roof openings for piping and ductwork or through suitable roof jack with pitch pocket. Coordinate location with roofing installation.
- C. Locate outlet boxes to allow luminaires positioned as indicated on reflected ceiling plan.
- D. Align adjacent wall mounted outlet boxes for switches, thermostats, and similar devices.

3.11 ADJUSTING

- A. Adjust flush-mounting outlets to make front flush with finished wall material.
- B. Install knockout closures in unused openings in boxes.

3.12 CLEANING

- A. Clean interior of boxes to remove dust, debris, and other material.
- B. Clean exposed surfaces and restore finish.

- END OF SECTION -

PART 1 – GENERAL

1.1 SUMMARY

- A. This section describes the requirements for the cabinets and enclosures for this project.

1.2 REFERENCES

- A. National Electrical Manufacturer's Association (NEMA):
 - 1. NEMA 250; Enclosures for Electrical Equipment.
 - 2. NEMA ICS 1; Industrial Control and Systems.
 - 3. NEMA ICS 4; Terminal Blocks and Industrial use.
 - 4. NEMA ICS 6; Enclosures for Industrial Controls and Systems.
- B. Underwriters Laboratories (UL):
 - 1. UL 50; Enclosures for Electrical Equipment.
 - 2. UL 65; Standards for Wired Cabinets.
 - 3. UL 1059; Terminal Blocks.
 - 4. UL 1773; Termination Boxes.

1.3 SUBMITTALS

- A. Product Data: Submit manufacturer's standard data for enclosures, and terminal cabinets.
- B. Manufacturer's Instructions: Submit application conditions and limitations of use stipulated by product testing agency specified under Regulatory Requirements. Include instructions for storage, handling, protection, examination, preparation, and installation of product.

1.4 QUALITY ASSURANCE

- A. All materials, equipment and parts comprising the units specified herein shall be new, unused, and currently under production.
- B. Only products and applications listed in this Section may be used on the Project unless otherwise submitted.

PART 2 - PRODUCTS

2.1 CABINETS AND ENCLOSURES

- A. Description: Interior Locations: NEMA 1. Exterior locations: NEMA 3R
- B. Construction: Shall be code gauge galvanized steel with standard concentric knockouts for conduit terminations. Size shall be as indicated on Drawings.

CABINETS AND ENCLOSURES
SECTION 26 2716
3595001000

- C. Backboard: Furnish 5/8-inch-thick plywood backboard for mounting terminal blocks. Paint with (3) coats of fire retardant white paint.
- D. Finish: Manufacturer's standard gray baked enamel finish.
- E. Covers: Continuous hinged steel door, lockable and keyed to match panelboard locks. Provide padlock hasp at exterior locations.
- F. Mounting:
 - 1. Flush cabinets shall be furnished with concealed trim clamps and shall be not less than 4 inches deep.
 - 2. Surface cabinets shall be furnished with screw cover trim, flush hinged door and shall not be less than 6 inches deep.

2.2 SIGNAL TERMINAL BACKBOARDS

- A. Furnish cabinet with 3/4-inch fire retardant plywood mounting backboard on interior unless otherwise indicated on Drawings. 8' high x width shown on plans or as required
- B. Finish: Paint with (3) coats of fire-retardant white paint

2.3 TERMINAL BLOCKS AND ACCESSORIES

- A. Terminal blocks: NEMA ICS 4; UL listed.
- B. Power terminals: Unit construction type, closed-back with tubular pressure screw connections, rated 600 volts.
- C. Identification: Identify terminal strips with permanent numbers.
- D. Wiring diagram: Provide wiring diagram in protective pocket on inside front cover of cabinet. Diagram shall indicate control wiring, connections, and layout of components within enclosure.

2.4 HINGED COVER ENCLOSURES

- A. Description: NEMA 250, Type 1 (Interior) and 3R (Exterior) steel enclosure
 - 1. Covers: Continuous hinge, held closed by flush latch operable by key.
 - 2. Furnish interior plywood panel for mounting terminal blocks and electrical components; finish with white enamel.
 - 3. Enclosure Finish: Manufacturer's standard enamel.

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Contractor shall thoroughly examine Project site conditions for acceptance of cabinets and enclosures installation to verify conformance with Manufacturer and Specification tolerances. Do not commence with installation until all conditions are made satisfactory.

3.2 INSTALLATION

- A. Set cabinets and enclosures plumb and symmetrical with building lines. Furnish and install all construction channel bolts, angles, etc. required to mount all equipment furnished under this Section of the Specifications.
- B. Cabinets and enclosures shall be anchored and braced to withstand seismic forces calculated in accordance with that referenced in Section 26 0100: Basic Electrical Requirement.
- C. "Train" interior wiring, bundle and clamp using specified plastic wire wraps.
- D. Install interior cabinets with top of enclosure 6'6" above finished floor.
- E. Install exterior cabinets with top of enclosure 6'6" above finished grade.
- F. Replace doors or trim exhibiting dents, bends, warps or poor fit that may impede ready access, security or integrity.
- G. Terminate conduit in cabinet with lock nut and grounding bushing.
- H. Terminate wiring on terminal blocks and identify each with heat shrink tags.

3.3 CLEANING

- A. Touch up scratched or marred surfaces to match original finish.
- B. Clean electrical parts to remove conductive and harmful materials.
- C. Remove dirt and debris from enclosure.
- D. Clean existing panelboards and load centers to remain or to be reinstalled.

- END OF SECTION -

PART 1— GENERAL

1.1 SUMMARY

- A. Section Includes
 - 1. This section describes the requirements for the circuit protective devices for this project.

1.2 REFERENCES

- A. Federal Specification (FS):
 - 1. FS W-C-375; Circuit Breakers, Molded Case, Branch Circuit and Service.
 - 2. FS W-F-870; Fuseholders (for Plug and Enclosed Cartridge Fuses).
- B. Underwriters Laboratories, Inc. (UL):
 - 1. UL 248(1-16); Low-Voltage Fuses.
 - 2. UL 489; Molded-Case Circuit Breakers, Molded-Case Switches and Circuit Breaker Enclosures.
 - 3. UL 512; Fuseholders.
 - 4. UL 1066; Low Voltage AC and DC Power Circuit Breakers Used in Enclosures.
- C. National Electrical Manufacturer Association (NEMA):
 - 1. NEMA AB 1; Molded Case Circuit Breakers.

1.3 SUBMITTALS

- A. Product Data
- B. Operation and Maintenance (O&M) Manuals

1.4 QUALITY ASSURANCE

- A. All materials, equipment and parts comprising the units specified herein shall be new, unused, and currently under production.
- B. Only products and applications listed in this Section may be used on the Project unless otherwise submitted.

1.5 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Delivery: Overcurrent Protective Device components shall not be delivered to the Project site until protected storage space is available. Storage outdoors covered by rainproof material is not acceptable. Equipment damaged during shipment shall be replaced and returned to Manufacturer at no cost to Owner.

CIRCUIT PROTECTIVE DEVICES

SECTION 26 2800

3595001000

- B. Storage: Store in a clean, dry, ventilated space free from temperature extremes. Maintain factory wrapping or provide a heavy canvas/plastic cover to protect units from dirt, water, construction debris and traffic. Provide heat where required to prevent condensation.
- C. Handling: Handle in accordance with Manufacturer's written instructions. Be careful to prevent internal component damage, breakage, denting and scoring. Damaged units shall not be installed. Replace damaged units and return equipment to Manufacturer.

PART 2 - PRODUCTS

2.1 FUSES

- A. General: All power fuses shall be time-delay, high interrupting (300 K AIC), current limiting type, unless otherwise noted on the Drawings. All fuses shall be the product of a single Manufacturer and shall be selectively coordinated when applied in 2:1 ratios. Types of fuses shall be as follows:
 - 1. 0 - 600 amperes: UL Class J, dual element, time delay type fuse with separate overload and short-circuit elements. The fuse shall hold 500% of rated current for a minimum of 10 seconds.
 - 2. 601 - 4000 amperes: UL Class L, time delay type fuses with 99.9% pure silver fuse links and "O-rings" to seal between the end bells and the fuse barrel. Fuses shall hold 500% of rated current for a minimum of 4 seconds, clear 20 times rated current in 0.01 seconds or less.
 - 3. Motor branch circuit fuses (0-600 amperes): UL Class J dual element, time delay type fuse. Motor branch circuit fuses shall be sized for Type 2 coordination for the motor controller and back-up motor overload protection and shall be coordinated with motor starter overload relay heaters.
- B. Control and instrument fuses shall be suitable for installing in blocks or fuse holders. Exact type and rating shall be as recommended by the Manufacturer of the equipment being protected.
- C. Fuses for installation in current limiting circuit breakers or motor circuit protectors shall meet the specific requirements of the Manufacturers of that equipment to ensure compatibility.

2.2 MOLDED CASE CIRCUIT BREAKERS

- A. Unless noted otherwise, circuit breakers shall be molded case, bolt on and trip indicating.
- B. Where stationary molded case circuit breakers are indicated on the Drawings to be current limiting type, they shall be current limiting as defined by UL 489 and shall not employ any fusible elements.
- C. Circuit breakers shall have interrupting capacity not less than that indicated on the Drawings or if not indicated, not less than 25,000 RMS symmetrical amps for 480

volt systems and 10,000 RMS symmetrical amps for 208 volt systems.

- D. Covers shall be sealed on non-interchangeable breakers and trip unit covers shall be sealed on interchangeable trip breakers to prevent tampering. Circuit breaker ratings shall be clearly visible after installation or engraved nameplates shall be provided stating the rating. All ferrous parts shall be plated to minimize corrosion.
- E. Circuit breakers shall be toggle, quick-make and quick-break operating mechanisms with trip-free feature to prevent contacts being held closed against overcurrent conditions in the circuit. Trip position of the breakers shall be clearly indicated by operating handles moving to a center position.
- F. Multipole breakers shall have a single handle to open and close all contacts simultaneously in both manual operation and under automatic tripping. Interpole barriers shall be provided inside the breaker to prevent any phase-to-phase flashover. Each pole of the breaker shall have means for Arc extinguishing.
- G. All terminals shall be rated for aluminum or copper wire.
- H. Unless noted otherwise, circuit breakers with trip ratings 400 amp and smaller shall be ambient temperature compensated, thermal magnetic type unless otherwise noted. Breakers shall be of full size, 1" per pole type. Panels with more than one branch breaker larger than 100 amps shall be installed in distribution type panels.
- I. Accessories: Provide accessories as noted on the Drawings, i.e. shunt-trip, auxiliary contacts, undervoltage trip, alarm switch, etc.
- J. Spaces in the boards shall be able to accept any combination of 1, 2 or 3 pole circuit breakers as indicated. Provide all necessary bus, device supports and mounting hardware sized for frame, not trip rating.
- K. Series rated breakers are not acceptable unless specifically noted on the Drawings.

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Contractor shall thoroughly examine Project site conditions for acceptance of cabinets and enclosures installation to verify conformance with Manufacturer and Specification tolerances. Do not commence with installation until all conditions are made satisfactory.

3.2 INSTALLATION

- A. Install overcurrent protective devices in accordance with Manufacturer's written instructions, as indicated on the Drawings and as specified herein.
- B. Tighten electrical connectors and terminals; including screws and bolts, in accordance with equipment Manufacturers published torque-tightening values for

CIRCUIT PROTECTIVE DEVICES
SECTION 26 2800
3595001000

equipment connectors. Where Manufacturers torque requirements are not indicated tighten connectors and terminals to comply with tightening torque specified in UL Standard 486A.

- C. Install overcurrent protective devices and accessories in accordance with Manufacturer's written instructions and with recognized industry practices to ensure that protective devices comply with requirements. All devices shall be installed in accordance with applicable CEC and NEMA standards for installation.
- D. Circuit breakers serving "Fire Alarm Control Panel(s)" shall be red in color.

3.3 FIELD QUALITY CONTROL

- A. The Contractor shall supply a suitable and stable source of electrical power to each test site.
- B. Testing of overcurrent protective devices shall be done only after all devices are installed and system is energized.
- C. Prefunctional testing:
 - 1. Visual and mechanical inspection:
 - a. Inspect for physical damage, defects alignment and fit.
 - b. Perform mechanical operational tests in accordance with Manufacturer's instructions.
 - c. Compare nameplate information and connections to Contract Documents.
 - d. Check tightness of all control and power connections.
 - e. Check that all covers, barriers and doors are secure.
 - 2. Electrical tests:
 - a. Circuit continuity: All feeders shall be tested for continuity. All neutrals shall be tested for improper grounds.
 - b. Determine that circuit breaker will trip under overcurrent condition, with tripping time in conformance with NEMA AB 1 requirements.
 - c. Test all circuit breakers with frame size 225 amps and larger and 10 percent of all circuit breakers with frame sizes less than 225 amps in each panelboard, distribution board, switchboard, etc. unless otherwise noted.
- D. Contractor shall replace at no costs to the Owner all devices which are found defective or do not operate within factory specified tolerances.
- E. Contractor shall submit the final test report for review prior to Project closeout and final acceptance by the Owner. Test report shall indicate test dates, devices tested, results, observation, deficiencies and remedies. Test report shall be included in the operation and maintenance manuals.

3.4 ADJUSTING

CIRCUIT PROTECTIVE DEVICES
SECTION 26 2800
3595001000

- A. Adjust circuit breaker trip settings for coordination with other overcurrent protective devices in system.
- B. Adjust circuit breaker trip settings for adequate protection from overcurrent and fault currents.

3.5 CLEANING

- A. Upon completion of Project prior to final acceptance the Contractor shall thoroughly clean overcurrent protective devices per Manufacturer's approved methods and materials. Remove paint splatters and other spots, dirt and debris.

- END OF SECTION -

PART 1 - GENERAL

1.1 SUMMARY

- A. This section describes the basic requirements for the fire alarm system work on this project.

1.2 REFERENCES AND STANDARDS

- A. California Fire Code (CFC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. American National Standards Institute, Inc. (ANSI): ANSI C62.41
- C. National Fire Protection Association (NFPA): 72, 101
- D. Underwriter Laboratories, Inc. (UL)
 - 1. UL 38; Manual Signaling Boxes Fire Alarm Systems.
 - 2. UL 268; Smoke Detectors for Fire Alarm Signaling Systems.
 - 3. UL 268 A; Smoke Detectors for Duct Application.
 - 4. UL 464; Audible Signal Appliances.
 - 5. UL 497B; Protectors for Data Communications and Fire Alarm Circuits.
 - 6. UL 521; Heat Detectors for Fire Protective Signaling Systems.
 - 7. UL 864; Control Units and Accessories for Fire Alarm Systems.
 - 8. UL 1424; Cables for Power-Limited Fire-Alarm Circuits.
 - 9. UL 1480; Speakers for Fire Alarm, Emergency and Commercial and Professional Use.
 - 10. UL 1481; Power Supplies for Fire-Protective Signaling Systems.
 - 11. UL 1638 Visual Signaling Appliances Standard.
 - 12. UL 1711; Amplifiers for Fire Protective Signaling Systems.
 - 13. UL 1971 Signal Devices for Hearing Impaired.
- E. International Engineering Consortium (IEC): IEC 60849
- F. Factory Mutual System (FM) approval guide: FM P7825

1.3 SUBMITTALS

- A. Product Data
- B. Operation and Maintenance (O&M) Manuals
- C. Field Test Reports

FIRE ALARM SYSTEM
SECTION 26 6116
3595001000

1.4 QUALITY ASSURANCE

- A. All materials, equipment and parts comprising the units specified herein shall be new, unused, and currently under production.
- B. Only products and applications listed in this Section and in the Electrical Drawings may be used on the Project unless otherwise submitted.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Products furnished by the Manufacturers indicated in the Electrical Drawings and this section shall be acceptable if in compliance with all features specified herein
 - 1. Gamewell-FCI
 - 2. Cooper Wheelock

2.2 CONDUIT AND WIRE

- A. Conduit:
 - 1. Conduit shall be in accordance with the California Electrical Code (CEC).
 - 2. Where required, all wiring shall be installed in conduit. Conduit fill shall not exceed 40 percent of interior cross-sectional area where three or more cables are contained within a single conduit.
 - 3. Cable must be separated from any open conductors of power, or Class 1 circuits, and shall not be placed in any conduit, junction box or raceway containing these conductors, per CEC Article 760-29.
 - 4. Wiring for 24-volt DC control, alarm notification, emergency communication and similar power-limited auxiliary functions may be run in the same conduit as initiating and signaling line circuits. All circuits shall be provided with transient suppression devices and the system shall be designed to permit simultaneous operation of all circuits without interference or loss of signals.
 - 5. Conduit shall not enter the fire alarm control panel or any other remotely mounted control panel equipment or back boxes, except where conduit entry is specified by the Life Safety Control Panel (LSCP) manufacturer.
 - 6. Connectors shall be compression type fittings to join EMT to a box or enclosure and to couple two ends of EMT conduit. Fittings shall be: Zinc plated, steel UL listed concrete tight, and threadless where connecting to conduit. Male hub threads -NPSM (American National Standard Pipe Straight Mechanical) where connecting to box or cabinet with steel locknuts.
- B. Wire:
 - 1. Wiring shall be in accordance with state and national codes (e.g., CEC Article 760) and as recommended by the manufacturer of the fire alarm system. Number and size of conductors shall be as recommended by the fire alarm system manufacturer, but not less than 18 AWG (1.02 mm) for Initiating Device Circuits

and Signaling Line Circuits, and 14 AWG (1.63 mm) for Notification Appliance Circuits.

2. All wire and cable shall be listed and/or approved by a recognized testing agency for use with a protective signaling system.
 3. Wire and cable shall be installed in conduit or metal surface raceway when in exposed spaces. Minimum size of conduit shall be 3/4" inch. Utilize Wiremold 700 series surface raceway (in lieu of conduit) for area where conduit cannot be installed concealed. Cable above accessible ceiling can be installed free air when using applicable cable. Support all free air cable every 48" with j-hooks.
 4. All field wiring (with exception of external communications Ethernet) shall be electrically supervised for open circuit and ground fault.
 5. The LSCP shall be capable of T-tapping NFPA Style 4 (Class B) Signaling Line Circuits (SLCs). Systems which do not allow or have restrictions in, for example, the number of T-taps, length of T-taps etc., is not acceptable.
- C. Terminal Boxes, Junction Boxes and Cabinets: All boxes and cabinets shall be UL listed for their use and purpose.
- D. The fire alarm control panel shall be connected to a separate dedicated branch circuit, maximum 20 amperes. This circuit shall be labeled at the main power distribution panel as FIRE ALARM. LSCP primary power wiring shall be 12 AWG. The control panel cabinet shall be grounded securely to either a cold water pipe or grounding rod. The control panel enclosure shall feature a quick removal chassis to facilitate rapid replacement of the LSCP electronics.

2.3 FIRE ALARM DEVICES

- A. Initiation: See Component Schedule in the Electrical Drawings for details
1. Monitor Module
 2. Heat Detector
 3. Smoke Detector
- B. Notification: See Component Schedule in the Electrical Drawings for details
1. Strobe
 2. Combination Speaker-Strobe
 3. Sync Module

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Contractor shall thoroughly examine Project site conditions for acceptance of cabinets and enclosures installation to verify conformance with Manufacturer and Specification tolerances. Do not commence with installation until all conditions are made satisfactory.

FIRE ALARM SYSTEM
SECTION 26 6116
3595001000

3.2 INSTALLATION

A. General:

1. The 120/208-volt, 3 wire, 60 cycles AC emergency power supply required to power the system. Connect to red colored circuit breaker(s) in panel board. Identify circuit as "Fire Alarm Circuit Control".

B. Wiring:

1. Individual input and output device addressability as well as remote sensitivity measurement, supervision and power shall all be performed on the same pair of wires. Wiring shall be Class B.
2. Each Class B initiating circuit shall consist of a two (2)-wire circuit. allowing a maximum of 20 T-taps and not requiring any end-of-line device for supervision. Each initiating circuit shall accommodate up to 75% of the manufacturers maximum addressable programmable initiating devices, to allow for future expansion.
3. Wiring for shielding certain conductors from others or routing in separate raceways, shall be as recommended by the Manufacturer's current requirements.
4. All wiring shall be installed in a continuous steel conduit or metal surface raceway when in exposed spaces. All conduit fittings shall be steel compression. Conduit shall be of the size recommended by the equipment Supplier with a minimum of 3/4" inch.
5. Wire color-coding shall remain the same throughout the system.
6. No wiring other than that directly associated with life safety/fire alarm detection, alarms, or auxiliary fire protection functions (no 120 VAC), shall be permitted in life safety/fire alarm conduits.
7. Make conduit and wiring connections to sprinkler flow switches, PIV's, sprinkler valve monitors, door hold-open/closure devices, smoke management fans, smoke dampers, elevator controller, emergency generator, etc.
8. All wiring shall be checked and tested to ensure that there are no grounds, opens or shorts.
9. All life safety/fire alarm junction boxes shall be color-coded and marked
10. Wire nut splices are not allowed.
11. Wires shall be numbered at each connection, termination, and junction point. Wire numbering tags shall be Brady Perma-Code, Westline or equal wire markers. Each group of wires shall be tagged with its destination at each panel, terminal box or junction box.
12. All wire used on the life safety/fire alarm and communication system shall have a minimum insulation rating of 105 degrees C. Bell wire or thermostat wire is not acceptable.

3.3 FIELD QUALITY CONTROL

A. Pre-functional testing: Visual and mechanical inspection

1. Inspect for physical damage, defects alignment and fit.

2. Perform mechanical operational tests in accordance with Manufacturer's instructions.
3. Compare nameplate information and connections to Contract Documents.
4. Check tightness of all control and power connections.
5. Check that all covers, barriers and doors are secure.
6. Visually check all sampling pipes to ensure that all joints, fittings, bends, sampling points, etc., comply with the Specification.
7. Check the air sampling system to ensure the following features are operational and programmed in accordance with the specification.
 - a. Alarm threshold levels
 - b. Pipes in use
 - c. Detector address
 - d. Clock and date
 - e. Time delays
 - f. Air flow fault thresholds
 - g. Display buttons operable
 - h. Check to ensure that all ancillary warning devices operate as specified.
 - i. Check interconnection with LSCP to ensure correct operation.

B. Pre-functional testing: Electrical tests

1. The system shall be completely tested prior to final acceptance testing. All points shall be tested from point of initiation to the final point or points of annunciation. All circuits shall be tested for continuity and ability to transmit the required signal correctly to the LSCP. Any problem due to wrong wire type, wire twist, impedance, mismatches, noise filtering or shielding shall be completely corrected during pretesting and prior to any final acceptance tests.
2. Testing shall include each and every device in the system. Coordinate with other trades as necessary for testing.
3. Tamper switches: Verify "trouble" signal is received and alarmed on closing of each valve.
4. Smoke detectors and duct smoke detectors: Test with actual or approved artificial smoke. Verify that reset does not occur when devices are cleared of smoke. Verify supervisory circuit function. Perform pressure differential test on all duct-mounted smoke detectors.
5. Intelligibility testing shall be per IEC 60849 and verified and tested by a third-party testing organization.
6. Central station notification: Verify that one set of conductors in the terminal cabinet becomes a short circuit on any "trouble" condition and that the other set becomes a short circuit on any "alarm" condition. Verify that the conductor groups are labeled properly.

C. Contractor shall replace at no costs to the Owner all devices which are found defective or do not operate within factory specified tolerances.

**FIRE ALARM SYSTEM
SECTION 26 6116
3595001000**

END OF SECTION

PART 1 - GENERAL REQUIREMENTS

1.1 OVERVIEW

- A. Copper cabling will be Panduit with a 25 year Pan-Net warranty.
 - 1. At project completion, the contractor shall present to owner a single project binder with electronic and hard copies of test results, as built drawings, pictures, bill of materials listing part numbers, etc. and a Visio 2007 drawing electronic provided to owner's Information Services and Educational Technology (ISET) office which identifies all Data jack locations and port assigned numbers.
- B. The installing contractor shall furnish and install all hardware, cables, devices, and other materials even though not specifically mentioned herein, which are necessary for the proper integration of the system so that the system shall perform the functions listed herein in compliance with all specified requirements.
- C. A Contractor may use up to ONE sub-contractor to install all CAT6 data cabling. Contractor will provide 'As Builts' and warranty information to ISET department.
 - 1. The contractor shall have a minimum of five years professional field experience pulling/terminating fiber and Cat6 cable.
 - 2. The contractor shall possess a valid C-7 California State contractor's license. This license shall have been issued two (2) years prior to the date of the bid. No other license classification is acceptable.
 - 3. The contractor and/or sub-contractors shall have Panduit Certified Installers as well as Corning Certified NPI Installers.
- D. The contractor and/or sub-contractors shall have at least half BICSI installers and one RCDD who will work on the project.
 - 1. The contractor shall provide a twenty-five (25) year application performance warranty for all Panduit Pan-Net copper cable and connectivity products. The system shall be installed to meet all TIA/EIA commercial building wiring standards and installed per appropriate Panduit instruction sheets. If any Panduit product fails to perform as stated above, Panduit will provide new components at no charge.

1.2 ABBREVIATIONS

- A. A.P. - Wireless Access Point
- B. AFF - Above the finished floor
- C. BKBRD - Backboard
- D. E.F. - Entrance Facility (formerly called MPOE or MPOP)

DATA COMMUNICATIONS
SECTION 27 1000
3595001000

- E. E.R. - Equipment Room. A building/campus serving facility connecting backbone to horizontal cabling and housing the building/campus' core system equipment.
- F. IDF – Intermediate Distribution Facility
- G. ISP - Inside Plant
- H. MAC - Moves, Adds, and Changes
- I. MDF – Main Distribution Facility
- J. MM - Multimode fiber
- K. NEXT - Near End Crosstalk
- L. OSP - Outside Plant
- M. SM - Single mode fiber
- N. T.R./T.E. - Telecommunications Room/Enclosure. A floor serving facility connecting backbone and E.R. to horizontal cabling in a region on each floor.
- O. TBB - Telecommunications Bonding Backbone
- P. TGB - Telecommunications Ground Buss Bar
- Q. TMGB - Telecommunications Main Ground Buss Bar
- R. U.O.N. - Unless otherwise noted

1.3 RELATED DOCUMENTS

- A. In addition to these specifications, the contractor shall reference the following drawings and documents:
 - 1. Architectural / Engineer drawings
 - 2. Detail Visio 2007 As Built Drawings and Diagrams.
 - 3. Any addendum, hereafter release of specifications
 - 4. Panduit Pan-Net 25 year Warranty
- B. Contractor shall ensure that, manufacture, ANSI/TIA/EIA-586-B cable testing, and install of the telecommunications cabling network is per manufacturer's requirements and in accordance with NFPA-70 (National Electrical Code®), state codes, local codes, requirements of authorities having jurisdiction, and particularly the following standards:
 - 1. ANSI/TIA/EIA-568-B.1 - Commercial Building Telecommunications Cabling Standard, Part 1: General Requirements
 - 2. ANSI/TIA/EIA-568-B.2 - Commercial Building Telecommunications Cabling Standard, Part 2: Balanced Twisted Pair Cabling Components
 - 3. ANSI/TIA/EIA-568-B.3 - Optical Fiber Cabling Components Standard

4. ANSI/TIA/EIA-569-A - Commercial Building Standard for Telecommunications Pathways and Spaces
 5. ANSI/TIA/EIA-606(A) - The Administration Standard for the Telecommunications Infrastructure of Commercial Buildings
 6. ANSI/TIA/EIA-607(A) - Commercial Building Grounding and Bonding Requirements for Telecommunications
 7. ANSI/TIA/EIA-758(A) Customer-Owned Outside Plant Telecommunications Cabling Standard
 8. ISO/IEC 11801:2002 ed 2- International standard for Class F (Cat7)
 9. IEC 61076-3-104:2002- International standard for RJ quad jack
 10. ISO/IEC CD14165-114 - International standard for duplex gigabit on two pair Ethernet
 11. TIA TSB 155 - 10G Ethernet over existing Cat6 up to 50 meters
 12. ANSI/TIA/EIA 565.B.2,10 - Standard for Cat6
 13. Cal/OSHA-Pocket Guide for the Construction Industry (recent edition)
- C. Contractor shall install cabling in accordance with the most recent edition of BICSI publications:
1. BICSI - Telecommunications Distribution Methods Manual (TDMM)
 2. BICSI - Cabling Installation Manual
 3. BICSI - Customer-Owned Outside Plant Design Manual
- D. Federal, state, and local codes, rules, regulations, and ordinances governing the work, are as fully part of the specifications as if herein repeated or hereto attached. If the contractor shall note items in the drawings or the specifications, construction of which would be code violations, promptly call them to the attention of the owner's representative in writing. Where the requirements of other sections of the specifications are more stringent than applicable codes, rules, regulations, and ordinances, the specifications shall apply.

1.4 PRE-INSTALLATION MEETING

- A. Schedule a meeting a minimum of five calendar days prior to beginning work.
- B. Agenda: Clarify questions related to work to be performed, scheduling, coordination, labeling for data jacks, data jack layout on telco racks in MDF and IDFs, etc.
- C. Attendance: Communications systems installer, general contractor, architects representatives, and other parties affected by work.
- D. A copy of manufacturer warranty application shall be provided at this meeting.

1.5 WARRANTY

- A. The project shall be pre-registered with manufacturer before installation has begun.
- B. The installation will have to pass scan tests by a certified contractor.

DATA COMMUNICATIONS
SECTION 27 1000
3595001000

- C. The installation will have to be documented with labels and drawings.
- D. A 25-year PAN-NET manufacturer warranty covering all components, equipment and workmanship shall be passed through in writing with system documentation. The warranty period shall begin on the system's first use by the owner.

1.6 APPROVED PARTS LIST

The following is an approved parts list:

Wire Management

Manufacturer	Part Number	Description
Panduit		J-Hooks shall be Panduit
Panduit	WMP1E	2U Horizontal Wire management
Panduit	WMPSE	1U Horizontal Wire Management
Panduit	CLT100F-C3	1" Split Loom Tubing Orange
Panduit	CLT188F-X3	1.88" Split Loom Tubing Orange
		1" Fiber Innerduct
		2" Fiber Innerduct
Panduit	CWF400N	4" Conduit Waterfalls
Panduit	CCMKIT1	Cable Management Kit
Panduit	WMPVHC45E	Vertical Cable Manager Front & Rear
Panduit	NCMH2	2U Horizontal Cable Manager Front & Rear
Trilobular		Taptite II thread

Twisted Pair Products

Manufacturer	Part Number	Description
Panduit	PUR6004BU-U	Cat 6 Riser Blue
Panduit	PUR6004WH-U	Cat 6 Riser White
Panduit	PUR6004OR-U	Cat 6 Riser Orange
Panduit	PUR6004RD-U	Cat 6 Riser Red
Panduit	PUR6004YL-U	Cat 6 Riser Yellow
Panduit	PUR6004VL-U	Cat 6 Riser Violet
Panduit	PUP6004BU-U	Cat6 Plenum Blue
Panduit	PUP6004WH-U	Cat6 Plenum White
Panduit	PUP6004OR-U	Cat6 Plenum Orange
Panduit	PUP6004RD-U	Cat6 Plenum Red
Panduit	PUP6004YL-U	Cat6 Plenum Yellow
Panduit	PUP6004VL-U	Cat6 Plenum Violet
General Cable	7136100	Outside Plant Cat 6
Panduit	CFPE1WHY	1 Port White Faceplate
Panduit	CFPE2WHY	2 Port White Faceplate
Panduit	CFPE4WHY	4 Port White Faceplate
Panduit	CFPE6WHY	6 Port White Faceplate
Panduit	CFP2SY	Stainless Steel 2 Port Faceplate
Panduit	CJ688TGWH	Cat 6 Jack White
Panduit	CJ688TGOR	Cat 6 Jack Orange
Panduit	CJ699TGYL	Cat 6 Jack Yellow
Panduit	CJ688TGBL	Cat 6 Jack Blue
Panduit	CJ688TGVL	Cat 6 Jack Violet
Panduit	CJ688TGRD	Cat 6 Jack Red

DATA COMMUNICATIONS
SECTION 27 1000
3595001000

Panduit	CPPL24WBLY	Blank, Minicom, 24 port patch panel
Panduit	CPPL48WBLY	Blank, Minicom, 48 Port Patch Panel
Panduit	SRBWCY	Strain Relief for Patch Panel
Panduit	PSL-DCJB	Black out Module Red (Need White, Red Listed)
Panduit	PSL-DCJB-IW	Black out Module White
Panduit	PSL-DCJB	Black out Module
Panduit	C4PPLK	Replacement Label Kit
Panduit	UTPSP3RD	3 Foot Cat 6 Red Patch Cord
Panduit	UTPSP5RD	5 Foot Cat 6 Red Patch Cord
Panduit	UTPSP3OR	3 Foot Cat 6 Orange Patch Cord
Panduit	UTPSP6OR	5 Foot Cat 6 Orange Patch Cord

Raceway

<u>Manufacturer</u>	<u>Part Number</u>	<u>Description</u>
Panduit	LD3WH6-A	LD3 Raceway (Substitute 6 with 8 and 10, for Longer Lengths)
Panduit	LD5WH6-A	LD5 Raceway (Substitute 6 with 8 and 10, for Longer Lengths)
Panduit	LD10WH6-A	LD10 Raceway (Substitute 6 with 8 and 10, for Longer Lengths)
Panduit	CFXWH-E	Raceway Coupler (Replace 'X' with 3, 5, or 10 for the different size raceway)
Panduit	RAFXWH-E	Right Angle Fitting (Replace 'X' with 3, 5, or 10 for the different size raceway)
Panduit	ICFXWH-E	Inside Corner Fitting (Replace 'X' with 3, 5, or 10 for the different size raceway)
Panduit	OCFXWH-E	Outside Corner Fitting (Replace 'X' with 3, 5, or 10 for the different size raceway)
Panduit	DCFXWH-E	Drop Ceiling Fitting (Replace 'X' with 3, 5, or 10 for the different size raceway)
Panduit	JBX3510WH-A	Single Gang Outlet for LD Raceway

Tools

<u>Manufacturer</u>	<u>Part Number</u>	<u>Description</u>
Panduit	CGJT	
Panduit	EGJT	
Panduit	CWST	
Panduit	CJAST	
Panduit	TTS-20R0	Tak Tape Rolls
Panduit	HLS-75R0	Bulk Velcro

**DATA COMMUNICATIONS
SECTION 27 1000
3595001000**

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. The acceptable manufacturer for the cabling connectivity is Panduit/General copper or Panduit/Panduit copper.
- B. Part listed are the owner's standards and any substitutions shall be approved in writing through submittal.
- C. Panduit 25 year Pan-Net.
- D. Corning Cable

2.2 QUANTITIES

- A. Distances mentioned and shown on drawings or spreadsheets are approximate. Field verification shall be made prior to install.
- B. Quantities listed here and in "parts list" document take precedence over drawing quantities.

2.3 SYSTEM COMPONENTS

- A. Materials provided shall meet or exceed the standards/description listed below.
- B. Fiber Trunk Cable
 - 1. Corning 12 strand single mode outdoor riser fiber optic cable
- C. Horizontal Cable (Cat6):
 - 1. Solid copper, 24 AWG, 100 balanced twisted-pair (UTP) Category 6 cables with four individually twisted-pairs, which meet or exceed the mechanical and transmission performance specifications in ANSI/TIA/EIA-568-B.2 to 250 MHz. General Cables Genspeed 6000 Enhanced CAT6E meets the specification.
 - 2. Use plenum rated cable in PLENUM air environments only.
 - 3. Use gel-filled or other outdoor plant cables in OSP environments as under slab concrete, outside near water, etc.
- D. Connectors (Cat6):
 - 1. 8-pin modular, category 6, pinned to T5689B standard.
- E. Faceplates:
 - 1. Provide 1, 2, 4 or 6 port faceplates and use classic style with label window. Fill unused ports with blank inserts.
- F. Patch Frames:

1. Data frame is to be 19" rack mountable, 24 or 48 empty ports for 8-pin modular jacks. Panels shall include a window for labels. Note: unused ports are to be filled in with black blank inserts.

G. Wire management:

1. On racks the horizontal cable managers shall be Panduit center mounting brackets (WMPF1E) for the wire managers in front for easy access during MACs. Horizontal managers shall be a minimum 1 RU.
2. Vertical cable managers (WMPVHC45E) are to be same height as rack. With fingers in the rear and in the front. They shall to have a bend radius control or strain relief clips. Panduit vertical managers are to be used for extra capacity.
3. Cable runway shall be ladder style or mesh /solid cable tray with a 12" width and 4" depth. The runway shall be mounted to a support loading wall as well as supported to the rack. An angle transition shall be used for adjoining runways or 90 degree bends. A cable drop shall be used to protect cables transitioning from runway to point of termination. If using a ladder style, use cable fingers attached to the sides to prevent spilling of cable over the sides.

H. Cable Pathways:

1. J-hooks will be used for suspending cables. These hooks shall have a 50 cable capacity and optional mounting. Preferred hooks have a wheel attachment capability so cables will not be dragged across during installation. Ensure that bends and edges will not pinch or cut cable sheath. Provide enough J-hooks to keep pathway along walls, J-hooks shall not cross the room.
2. Penetrations through fire rated walls shall utilize a metallic assembly with fire stop built into the assembly. EZ Path mechanical fire stop by Specified Technologies meets this requirement and shall be used. There is no exception to this.

I. Miscellaneous:

1. Cable ties shall be Velcro with a loop strap. Nylon cable ties shall not be used. If they are they shall be black and strapped with a loose tie so as not to pinch the cable sheath and with enough slack to get snips and fingers between tie and cable. The end of the tie shall be cut off after strapping.
2. Labels for patch panels, faceplates, and cables shall be by one manufacturer. Ex: Label Ware, EasyMark, Brady, LabelMo, etc.
3. All conduits shall have a maximum fill ratio of 60%.
4. All labels including the cable label shall be laser printed.
5. Labeling (Wire and Wall Jacks): All Labeling shall follow the "Tracy U.S.D. Labeling Format" (See "Tracy U.S.D. Labeling Format" Spreadsheet) with exception of workstation cables (i.e. patch cords). Hand written labels are not acceptable. All labels shall be machine printed black lettering on opaque white tape, stenciled onto adhesive labels, or type written onto adhesive labels. The font shall be at least one-eighth inch (1/8") in height, block characters, and legible. Patch panels shall be assembled and terminated in a sequential order, exhibiting room and workstation numbers for all workstations served by the MDF or IDF.

DATA COMMUNICATIONS
SECTION 27 1000
3595001000

6. Each fiber optics cable segment shall be labeled at each end with its respective IDF identifier. Each fiber interconnect device shall be labeled with its respective IDF identifier.
7. Each telecommunication outlet shall be labeled with its respective workstation number respective (machine labels only).
8. Workstation Terminal Outlets are to be installed within single-gang or double-gang electrical boxes. No mud-rings are to be used. WAO faceplates are to have labeling which identifies connected IDF.
9. Each copper backbone cable shall be machine labeled and printed EIA/TIA-606 Section 8 compliant only at each end with its respective IDF number/letter. Each binder group shall be tied off with its respective identifying ribbon at each breakout point.
10. Labeling will be completed before testing shall begin; discrepancies during inspection with the labeling will void all test results.

2.4 PROJECTOR

1. Contractor shall furnish and install Epson Brightlink 1485Fi and associated Epson Pilot control pad.

PART 3 - EXECUTION

3.1 SYSTEM SPECIFIC INSTRUCTIONS

A. Horizontal Cable:

1. Contractor shall label cables in 2 locations 12" apart.
2. Contractor is to terminate using the 568B pin out.
3. Contractor is to leave 10 feet of slack for all cables at the station in the accessible ceiling.
4. All cables will terminate at the stations with RJ45 connectors and shall be housed in a faceplate. If the connector is in the ceiling or behind a faceplate (such as the AV control panel) the connector shall be installed in a surface housing.

B. Closet/Rack:

1. All cables will terminate on the rack on a modular patch panel with an RJ45 connector.
2. A horizontal manager shall be installed above and below every 48 ports of patch panels (CPPL48WBLY) and switches.
3. A service coil shall be created above the rack on the wall of the closet. Do not place a service coil within the vertical and horizontal wire management. Cables within those managers shall be kept straight with proper bend radius.
4. The service coil shall be long enough to reach the farthest corner of the room and then down to the floor.
5. Patch frames shall be rack mounted using grounding screws and washers.

6. Note: unused ports on the patch frames are to be filled in with black blank inserts. Also, 1-2 blanks will be installed after each student data, teacher, admin, ceiling, and paging outlet with less than 4 cables to allow for future MACs.
7. Contractor shall place a drawing next to the data rack showing a floor plan with outlet locations and labels that match the rack labels. These drawings are to be laminated or in a plastic casing.

3.2 INSTALLATION PROCEDURES

- A. The following are installation practices that ensure superior performance and aesthetics.
- B. NOTE: References to conduit, raceway and electrical are for contractor's information. Actual installation of these components is included in another specification. If contractor notices a difference between actual install and the specs below, the contractor shall bring that immediately to the attention of the electrical engineer.
- C. Work Area Outlet
 1. The 10 ft coil shall not be a traditional service loop. Rather, the cable shall be extended along the wall then brought back at a lower height.
 2. A pull string for MACs shall be pulled with cable into accessible ceiling space or length of conduit. *Label strings to indicate destination of conduit.*
 3. Fill and label faceplates starting in the top left then moving right and downward.
 4. In addition to labeling, jacks shall be quickly identifiable by the following color:
 - a. Paging Jack Blue
 5. All jacks are to be terminated using 568B pin assignment.
 6. Minimize the amount of untwisting in a pair as a result of termination to connecting hardware. The amount of twisting shall not exceed 1/2" for category 6 and higher cables. Cable sheath shall touch the back of jack after termination (leave no portion of the cable exposed).
 7. A classic series faceplate (or surface mount box if needed) with a label window shall be used or the Jack itself labeled (Easy Mark #PLL-46-Y3C-1 or equal).
 8. The cable behind the faceplate shall also be labeled to match faceplate.
 9. ALL labels are to be machine generated, laminated, and adhesive.
 10. Each faceplate shall be labeled with its respective workstation number.
- D. Cable Pathways
 1. Acceptable Pathways:
 - a. All horizontal cable shall have support, the cable shall never be lain freely and resting on structural supports nor shall they use ceiling grid or lighting support wires.
 - b. The pathway to the work area shall allow for a minimum of 3 cable runs per individual work area.
 - c. Pathways shall ensure that a maximum pulling tension 25 lb-f is not exceeded and pathways (or installers) shall not deform the cable jacket. *If cable becomes kinked, contractor shall replace the cable.*

DATA COMMUNICATIONS
SECTION 27 1000
3595001000

- d. Acceptable pathways are: cable tray, j-hooks, conduit, and surface mount raceway. No floor mounted boxes.
- 2. J-hooks - responsibility of cable installer
 - a. Cables shall not be attached to ceiling grid or lighting support wires. Instead cable pathway shall be along walls. Cables shall never cross a room. The pathway shall always be along a wall. This makes for easier MAC as any tile next to a wall can be moved to access.
 - b. For large quantities of cables (50 to 75) that converge at the TR and other areas, provide cables trays that are specifically designed to support the required cable weight and volume. When more than 50 cables are in a pathway j-hooks shall not be used or a second pathway shall be created. (NOTE: It is recommended that no more than 25 UTP Cat6 cables be placed in a single J-hook).
 - c. If cable tray is used follow manufacturer guidelines for installation and use a product that is designed specifically for communications cabling. The depth of the tray shall not exceed 4".
 - d. When using J-hooks, locate them staggered between 4 ft to 5 ft to adequately support and distribute the cable's weight. Do not evenly space the hooks, vary between 4 to 5 feet between each hook to prevent signal disruption.
 - e. When using J-hooks install cable with a wheel pulley system that will remove after cable is in place.
 - f. Contractor shall not strap the cables in between hooks to enable easier MACs and to lessen possibility of alien crosstalk.
- 3. Conduit
 - a. When pulling through conduit, cable pulling lubricants shall be continuously applied to all cables and be specifically approved by the cable manufacturer.
 - b. Pull string shall be installed in conduit to allow future MACs. If more than one string is installed in a conduit, the strings shall be labeled for identification of destination.
 - c. Conduits shall have grommets on end to protect the cable.
 - d. No more than (2) 90 degree turns in a given length
- 4. Fill capacities
 - a. Cable pathways shall not be filled greater than the NEC maximum fill for the particular pathway type.
 - b. The fill cable capacity for conduit shall not exceed the following and be no more than 60% full:
 - 1) ½ " 0 – Do not use
 - 2) ¾ " 0 – Do not use
 - 3) 1" 4 – Do not use
 - 4) 1 ¼ " 6
 - 5) 1 ½" 8
 - 6) 2 " 12
 - 7) 2 ½ " 16

- 8) 3 " 24
- c. Fill capacity for raceway: (See Manufacturer Specs and Size by Cat6 requirements or 8.4mm/.33in diameter cable)
- 5. Distance Limitations
 - a. Horizontal cable distance (Outlet to Panel) is not to exceed 298 feet.
 - b. Premise cable distance (Outlet to Panel) shall be no less than 55 ft for any cable installed. Coil excess in ceiling if physically closer than 55 ft.
- 6. Aerial cable shall not be utilized.
- E. Bend Radius Limits
 - 1. The minimum bend radius for copper cable 4x cable diameter which is approximately 1.24 inches (31 mm).
 - 2. The minimum bend radius for indoor (ISP) backbone optical fiber when under no load is 10 times the cable diameter and while it is being pulled it is 15 times.
- F. EMI Avoidance
 - 1. Cabling shall be installed to avoid devices that cause electromagnetic interference, such as Microwaves, Refrigerators, lighting, ballasts, power panels, etc.
 - 2. Keep a minimum of 6" from electrical conductor cable.
 - 3. Telecommunications conductors shall not be routed closer than 6 ft. from any lightning protection system conductor.
- G. Cabinets and Racks
 - 1. Only black Velcro cable ties shall be used for bundling and routing. Bundles shall be loose and Velcro ties shall have at least 18 inches between and the bundle shall be loose enough to place two fingers between the cable and the ties.
 - 2. The service coil at the rack shall be located above the rack on the ladder rack/cable tray system or on the wall. Do not place the service coil within the vertical and horizontal wire management.
 - 3. Entrances to cabinets shall be protected with grommets and shall have a conduit stubbed to ceiling space.
 - 4. Installer shall create a detailed floor drawing designating jack locations and labels. A copy shall be attached inside the cabinet or back wall of the rack. The drawing shall also have the date and contractors contact information.
 - 5. Installer shall ensure that every telco rack/cabinet shall have separate and individual patch panels for workstation data cabling for each classroom, office or room space. In-addition, separate and individual patch panels shall be installed for each individual system such as: Extron A/V, Valcom IP Paging, Security Surveillance, and Wireless Access Point devices.
- H. Wire Management
 - 1. When bringing cable into the data rack, keep the bundle size small (optimum size may be 12 cables no more than 24 cables).

DATA COMMUNICATIONS
SECTION 27 1000
3595001000

2. Velcro Ties shall be used in place of cable ties. Do not cinch cables so tightly to deform the cable in any way. It is recommended to leave Velcro ties loose enough to get fingers in between without deforming cable. Velcro ties shall be placed no less than 18 inches from other Velcro straps.
3. Every 48 ports of patch frame shall have its own wire manager below and above (except angled patch frames). The manager shall be d-rings on the front for easy access for MACs. Rear management shall also be used and may be finger style or bar style.
4. In addition to the horizontal managers, the installer shall either install a vertical (WMPVHC45E) Panduit center mounting brackets for the wire managers for vertical management.
5. In addition to binding in Velcro ties, ring runs shall be used for cables run in corners and for drop and rise on walls. These bundles shall be labeled indicating the destination of the bundle (i.e. floor horizontal cables, to TR2, etc.).
6. When cable bundles transition from wall to a floor rack a cable tray or ladder rack shall be utilized. Install brackets on sides to prevent cables from falling off the rack if ladder rack is used.

I. Fire stopping

1. All procedures in this category shall be done in accordance with authority having jurisdiction (AHJ), local codes, CEC, and insurance underwriter's requirements. If a procedure in one of these effects performance, the AHJ shall be alerted immediately in writing.
2. Ensure that materials used are U.L. Listed.
3. For sleeves through ALL walls, EZ Path by Specified Technologies shall be used to ensure a fire stopped pathway on future MAC.
4. Contractor shall put a label per ANSL11A/EIA 569 with warning to not remove, company name and phone number, and date next to each penetration. Contractor shall also place a label stating how many cables can fit within the EZ Path. If initial install fills the firestop, the label shall read "Capacity full — DO NOT ADD CABLES". Do this labeling and take a picture to include in close out docs. Cabling will not exceed 60% fill.
5. If the firestop capacity is filled more than 85% during initial install, contractor shall install an additional EZ Path.

J. Grounding and Bonding

1. All network equipment, shielded cables, patch panels, racks, and tray/ladder rack segments shall be Bonded and Grounded according to TJNEIA 607, BICSI guidelines, CEC, insurance underwriter's requirements, and local code (AHJ). The purpose is to provide a path to ground for all components to ensure personal safety and equipment protection.
2. Ensure that materials used are U.L. Listed.
3. Conduits that contain grounding backbone conductors shall be bonded to the grounding conductor at each end of the conduit. This negates the high impedance choke" effect while the cable carries lightning currents.
4. All racks, trays, and electronics shall be grounded.

5. Contractor shall install on rack an ESD Port Kit on each rack in front and back.
6. The use of aluminum conductors is discouraged in the establishment of grounding scenarios. Aluminum does not provide the lowest resistive path. Additionally, aluminum conductors can become loose from mechanical screw/bolt connections due to vibration from carrying AC current.
7. Panduit's Data Center Grounding Solution and components shall be used. The following components shall be used to form a complete system (see the detailed drawing): Cabinet Grounding Complete Kit, Common Bonding Network Jumper (CBN) Kit, Surge Suppressor Jumper Kit, Front to Back Rail Jumper Kit, Rack Ground Strip Kit, Grounding Bus bar Kit, Paint Piercing Grounding Washers Kit, Thread Forming Screws, and Electrostatic Discharge (ESD) Discharge Port Kit.
8. Contractor shall test the ground system to ensure it has less than 5 Ohms. The test results shall be documented and submitted in close out docs.
9. Documentation: Contractor shall provide a single set of documentation to include test results and Visio "As-built" drawings in both soft copy and hard copy format.
 - a. Workstation Cable: The results of the workstation cable tests shall be provided in the form of printouts from the test equipment as well as computer file copies on CD with the software to read the results included. Test results shall be in PDF format.
 - b. As-Built Drawings: Contractor shall produce drawings depicting data outlet locations as they are actually installed. The drawings shall indicate actual cable routing, work station locations and workstation numbers, to be submitted before final inspection for punch list. Incorrect Visio drawings are punch list items and are to be corrected before re-inspection. "Tracy Unified School District's Telecommunications Jack Legend" shall be applied to all drawings. Results shall be returned to ISET within 30 days.

3.3 TESTING

- A. Testing shall be done with a Fluke Level IV cable tester (DTX 1800 meets this specification) and an Optical Time-Domain Reflectometer (OTDR). The new Fluke DTX 1800 unit is one test set that is capable of testing all frequencies through 900 MHz. If another manufacturer provides this test, contractor shall submit spec sheets and receive written approval for the tester prior to testing.
- B. Contractor shall ensure that the tester has been manufacturer calibrated within nine months of testing and has the latest software version downloaded.
- C. Prior to testing, the tester shall be set for the specific cable and jack used on the project.
- D. A summary test report shall be submitted as well as detailed reports for each cable.
- E. All test results shall have the individual cable label and project name in the header along with the date and time of testing.
- F. Test results shall clearly indicate a Pass or Fail on the report. If a cable fails in one parameter the test is considered a Fail. Marginal Pass cables (indicated with an asterisk) are not acceptable and will be considered as a Fail.

DATA COMMUNICATIONS
SECTION 27 1000
3595001000

- G. Any cable damaged or exceeding recommended installation parameters during installation shall be replaced by the contractor prior to final acceptance at no cost to the Owner.
- H. Test reports shall show a pass result for network standards, continuity, length, cross-talk, attenuation, and ambient noise.
- I. No Splices will be accepted.
- J. An optical time domain reflectometer (OTDR) test will be required on the existing fiber pathways prior to the work commencing and on conclusion of the work. District IT will provide final acceptance of the OTDR test results and sufficiency.

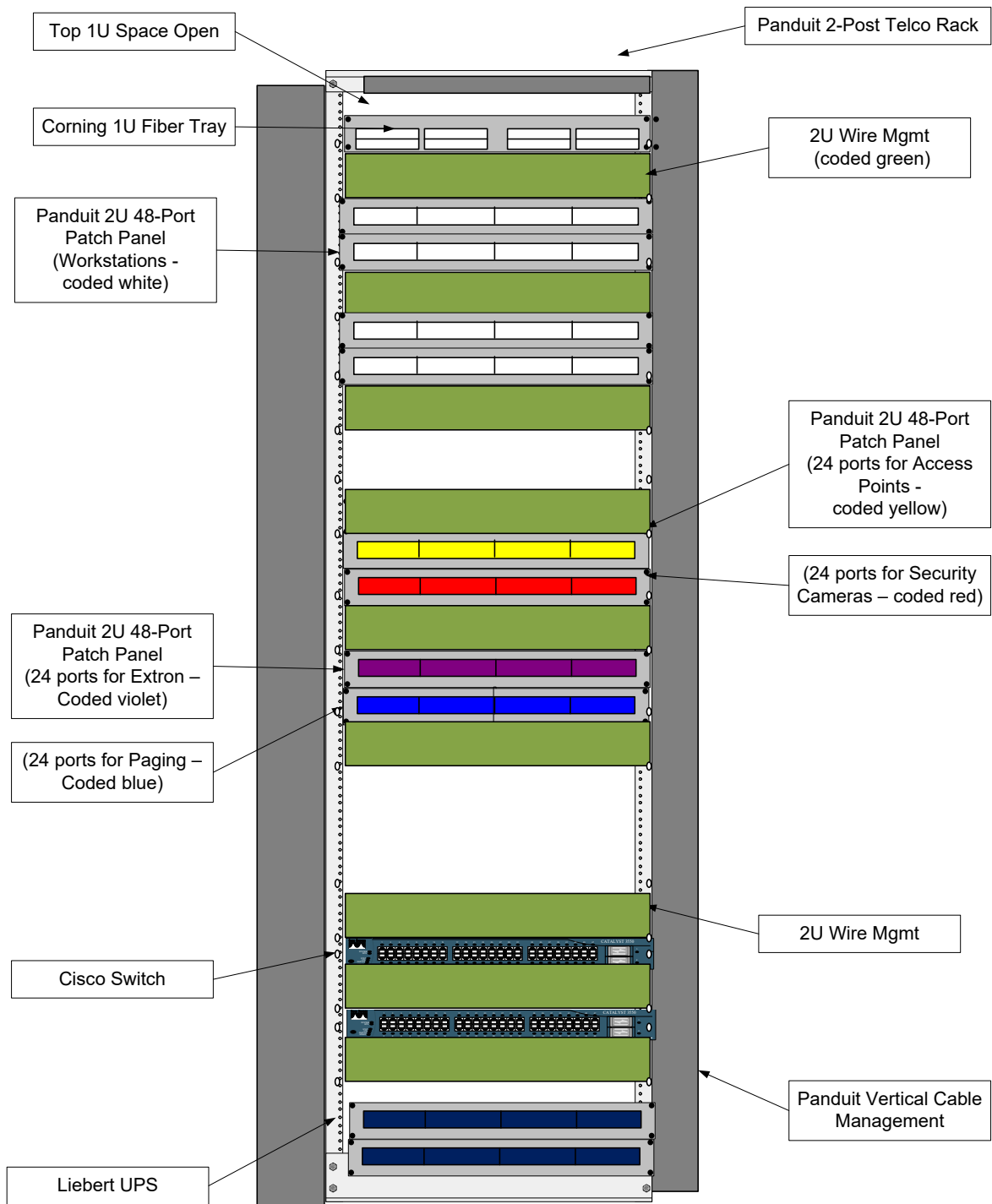
3.4 EXAMINATION /FIELD QUALITY CONTROL

- A. On a daily basis, the contractor's project manager shall inspect the installation to ensure that installers are following the specifications and quality craftsmanship.
- B. Throughout the project regular interval inspections will be completed by an architect representative to eliminate "unchangeable" installations.
- C. If the representative inspects the site and makes a change to the design or installation, this shall be noted in writing. The contractor shall not complete this change until approval is given.
- D. After installation, the architect representative will first inspect the site and create a closeout punch list for contractor to complete.
- E. After completion, the representative and contractor will inspect the site together.

3.5 IDENTIFICATION

- A. The labels are to be laser printed onto adhesive labels using software and labels by Label Ware, Easy Mark, Brady, LabelMo, etc.
- B. Each cable is to be labeled using the following pattern: XXX-A##
 - 1. Segment XXX: Designates the location where the other end of the cable is. That is, at the station it says what room the patch panel is, and at the patch panel it says what room the station is.
 - 2. Segment A: Designates which patch panel the cable is terminated. This allows 26 patch panels per closet.
 - 3. Segment ##: Designates which port on the patch panel the cable is terminated.
- C. Segment A and ## shall be the same on both sides of the cable.
- D. Contractor is to place labels onto the faceplates and panels. In addition, contractor shall place an adhesive label on each end of the cable.
- E. Layout of an IDF rack (*not to scale*). Rack height shall be 72".

**DATA COMMUNICATIONS
SECTION 27 1000
3595001000**



F. Labeling Format

1. All data cables at both the patch panel and the data jacks shall be labeled using the following standard labeling format. The labels are to be laser printed onto

DATA COMMUNICATIONS
SECTION 27 1000
3595001000

adhesive labels using software and labels by Label Ware, Easy Mark, Brady, LabelMo, etc.

2. Telecommunication outlets for a Valcom IP Paging horn, speaker or clock/speaker shall be labeled with its respective Valcom IP device number (machine labels only). Valcom numbers shall be comprised of the room number (i.e. C1, C2, etc.) and Valcom IP device number/drop number (i.e. PA1, PA2, etc.). Each data cable at a telecommunications outlet shall have an alpha identifier for the data jack (i.e. A). No biscuit shall be used and the data jack should be placed inside the Valcom back box. The labeling will start from the main door entering the room and go clockwise around the room. Each workstation cable shall be neatly labeled at each end with its respective workstation number.
3. Labeling for the respective port on the MDF/IDF patch panel shall be:
 - a. C1 – PA1 – A

3.6 CLEANING

- A. All work shall be cleaned to remove all dust, dirt, grease, paint or other marks. All electrical equipment shall be left in a clean condition inside and out, satisfactory to the owner. Keep buildings and premises free from accumulated waste materials, rubbish and debris resulting from work herein, and upon completion of said work, remove tools, appliances, surplus materials, waste materials, rubbish debris, and accessory items used in or resulting from work and legally disposed of offsite. For lead and asbestos dust removal, refer to "Safe School Standards" documentation.

3.7 CLOSEOUT

- A. The contractor will submit to owner within thirty days of completion a closeout package containing:
 1. Hard copy and electronic test results.
 2. Hard copy and electronic as-built drawings with labels (with extra copies to be posted in the E.R. and T.E.s).
 3. Warranty information and manuals.
 4. A bill of materials with part numbers to be used for later MAC.
 5. Hard copy and electronic pictures.
- B. As prerequisite to final acceptance, supply to the owner certificates of inspection from IOR and owner designated RCDD.

- END OF SECTION -

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. Furnish and install new IP devices into existing IP Sound/Communications System and Clock System, including all wiring and connections and other materials as shown on Plans and specified herein. It is the intent that complete operating systems be installed and that any power supplies, transformers, modules, cards, cages, programming, or other items required to achieve this end result shall be furnished whether or not such item or items are specified herein.
- B. IP School Application VoIP equipment supplied by Rauland-Borg, Inc. shall be considered as meeting all specification requirements.
- C. The system shall provide distribution of intercom, overhead paging, emergency paging, class change time tones and emergency tones.
- D. System shall be UL 813 and FCC Part 15 listed for safety reasons. Systems not listed are not acceptable.
- E. Site and System Investigation: Sound/Communications System bidder shall visit site prior to bid and become thoroughly knowledgeable about existing system and work required to perform work of this section. Failure to discover the equipment, materials, and labor required to complete the extensions will not relieve the contractor from completing the work at no additional cost. Existing system is Rauland TCU IP Sound/Communications System, and all devices shall integrate with existing system.

1.2 GENERAL REQUIREMENTS

- A. System Requirements: All of various equipment components to be complete with all appurtenant accessories required to provide specified facilities and perform specified functions throughout presently planned construction and space; and provisions for expanding system to provide same facilities, and perform same functions in all future planned construction, including space and mountings in consoles and terminal backboards.
- B. Equipment Tests and Standards:
 - 1. For all equipment operating at 26 volts or more, or utilizing over 50 watts, Contractor to submit proof within time allowed for submittals that all items of equipment will conform to requirements of U.L. Label or listing of equipment by U.L. to be accepted as evidence of conformance.
 - 2. For all items of equipment operating at 25 volts or less, and utilizing less than 50 watts, Contractor may submit, in lieu of such label or listing, written certificate from any nationally recognized testing agency, adequately equipped and competent to perform such services, that each item has been tested and conforms to U.L. standards, including method of test of U.L.
- C. Instructions and Manuals:

SOUND AND COMMUNICATIONS
SECTION 27 5123
3595001000

1. Equipment supplier of systems to demonstrate operation of systems to satisfaction of Owner and furnish Owner three (3) wiring schematics and a list of MAC addresses for all items of equipment, installation instructions, and details of all routine maintenance and servicing which must be given systems by Owner. Manuals shall be provided in 3-ring binders, with title page, list of contents, and conspicuous label on cover and shall be delivered to District. Submit copy to Architect for approval before delivering to Owner.
2. Supplier shall demonstrate operation of systems and provide training to all end users, administrative staff, and system administrator. Coordinate times of instruction with District, at District's convenience. Supplier shall provide a minimum of 2 hours of user instructions to clerical staff and 4 hours of user/maintenance instructions to District maintenance personnel. Instruction periods shall not coincide and shall be scheduled with District, not school staff. District shall provide list of authorized personnel for training sessions.

D. Submittals:

1. Refer to Section 27 1000.
2. Contractor shall submit name of firms he proposes to do work under this Section, addresses, phone numbers, and name of firm's contact, for approval. Such firms shall be factory authorized representatives of the existing system and submittal shall include manufacturer's letter of confirmation. Proposed firm shall furnish all equipment and specialty cables, make all connections to same, and place the systems in operation. Such firms shall have offices and service departments within a 100 mile radius of project and shall have been in business of this type for at least five years.

E. Record Drawings:

1. Final Inspection will not be made until drawings are received and approved. Record Drawings shall include "As-Built" one-line and wiring diagrams, with terminations identified, wire color coding schedule, pullbox locations, and conduit routing plans.
2. The Contractor shall provide complete drawings detailing all interconnections and panel wiring diagrams in Visio 2000 format.

F. Guarantee:

1. One firm to assume full responsibility for performance on all work of this section. Guarantee all equipment against defects in material and workmanship for two (2) years, and provide on-the-premises service during normal working hours for two years, at no cost to Owner if trouble is not caused by misuse, abuse, or accident, or at current labor rates if so caused. Provide manufacturer's written one-year guarantee for equipment and parts to Owner.
2. Service shall normally be available within 24 hours from service department of authorized distributor of manufacturer by factory trained servicemen.

3. On-the-premises service at other than normal working hours to also be available, but labor charges for such calls to be paid by Owner at current labor rates.

PART 2 - DETAIL REQUIREMENTS AND PRODUCTS

2.1 SOUND/COMMUNICATIONS SYSTEM

- A. General: Install new IP devices into existing IP Intercommunications System.
- B. Verify existing server is provided and programmed.
- C. Provide station ports as required.
- D. Equipment Standards:
 1. All enclosures for all equipment to be of metal throughout system. Enclosures other than metal are not acceptable.
 2. Speaker grilles to be non-directional diffusion type insulated from speaker by fiber mounting board. Dampening material to be installed between mounting board and grille to prevent metallic resonance.

2.2 SYSTEM CABLING

1. Each clock and speaker shall have a Category-6 cable homerun from the local data rack. The cable shall be terminated on a jack and surface mount box inside the provided housing.
2. Electronics contractor completing this specification shall provide the patch cord for connecting the speaker to the jack. Contractor shall provide a 1 foot (or shorter) blue patch cable.
3. Refer to Section 27 1000 for wiring requirements.

2.3 REMOTE EQUIPMENT

- A. Outdoor Speakers: Rauland equivalent to Valcom V-1080-GY with V-9805 vandal resistant enclosure and VE8004 gateway.
- B. Interior Speakers: Rauland equivalent to Valcom V-1921 with square faceplate and VB-R12 recess mount backbox
- C. Clock: Provide 12", IP analog clock and recess mount backbox. Coordinate if existing spare clocks can be provided by the district.

PART 3 - EXECUTION

3.1 INSTALLATION REQUIREMENTS

- A. Electrical Contractor shall retain the services of the duly appointed representative as specified hereinbefore, who shall furnish all equipment, make all connections to same, and place system in operation. Technician and workman employed shall be particularly skilled in this type of work. Workmanship on installed systems shall be of professional quality, best commercial practice.
- B. All wiring throughout entire system shall be installed in conformance with standard industry practice.
- C. Station locations shall be identified by location and school's actual room numbers as furnished by District, and in all ways shall relate as closely as possible to record wiring drawings. Prior to performing final labeling and programming, coordinate information with District.

3.2 CONSTRUCTION MEETINGS

- A. The Contractor shall schedule construction meetings at the jobsite as follows:
 - 1. Prewire meeting shall occur after raceways are installed and prior to pulling of any wire or cable.
 - 2. Pre-termination meeting shall occur after wire and cable has been installed and prior to termination.
- B. Meetings shall be scheduled by the Contractor on a building by building basis and shall include the Project Inspector, School's Representative, the electrical subcontractor, and the Signal System subcontractor as a minimum.

3.3 TESTS

- A. After all equipment specified herein has been installed and is in operating condition, performance tests shall be conducted to determine that installation and components comply with these specifications. Contractor shall furnish competent personnel for these tests.
- B. Perform initial programming of system and audio level adjustments.
- C. Contractor shall physically walk to each speaker and ensure that sound is coming from each speaker.
- D. Contractor shall set the volume level to approximately 6 dB above ambient noise during occupancy.
- E. The sound level for each speaker and zone shall be tested with an audio meter.
- F. Contractor shall provide a drawing showing dB levels for each speaker and zone. The drawing shall be dated and signed by the person administering the test.

SOUND AND COMMUNICATIONS
SECTION 27 5123
359500100

- G. Contractor shall test the extension for each room. Extension also be noted on the drawings.
- H. Testing shall be scheduled with the Owner and shall occur after receipt by Architect of Contractor's written certification of completion, record one-line diagram, wiring diagrams, maintenance and operation manuals, and other "As-Built" data required by these specifications. Tests shall be scheduled with School before occupancy occurs.

- END OF SECTION -

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. Furnish and install extensions to the existing Intrusion Alarm System including all wiring and connections and other materials as shown on Plans and specified herein. It is the intent that a complete operating system be installed and that any power supplies, relays, resistors, cards, modules, programming, or other items required to achieve this end result shall be furnished whether or not such item or items are specified herein.
- B. Site and System Investigation: System bidder shall visit site prior to bid and become thoroughly knowledgeable about existing system and work required to perform work of this section. Failure to discover the equipment, materials, and labor required to complete the extensions will not relieve the contractor from completing the work at no additional cost.
- C. Proprietary Systems: Where school is protected and monitored by a proprietary system, such as ADT or Sonitrol, Contractor shall coordinate the exact requirements with those firms. If the Division 16 Contractor elects to use a sound and signal firm other than the proprietary company, the sound and signal firm must include in bid, the materials, equipment, and labor required by the proprietary company to make the extensions complete and fully functional.

1.2 GENERAL REQUIREMENTS

- A. System Requirements: All of various equipment components to be complete with all appurtenant accessories required to provide specified facilities and perform specified functions throughout presently planned construction and space; and provisions for expanding system to provide same facilities, and perform same functions in all future planned construction, including space and mountings in control panels and terminal backboards.
- B. Interruption of Service: Existing intrusion alarm system must be kept operational during unoccupied hours. In the event that the system or portion of system is nonoperational during off-hour periods as a result of work of this contract, the Contractor must provide guard(s) to patrol the campus. Guard(s) and guard duties proposed by Contractor must be acceptable to District and District Police (local enforcement if District does not have its own Police Services). All costs for security guard(s) shall be Contractor's responsibility.

1.3 QUALITY ASSURANCE

- A. Work shall be performed in accordance with all applicable requirements of the edition indicated on the drawings of all governing codes, rules and regulations including but not limited to the following minimum standards, whether statutory or not:
 - 1. California Electric Code (CEC)
 - 2. California Fire Code (CFC)
 - 3. National Fire Alarm Code with California Amendments (NFPA 72)

**INTRUSION ALARM SYSTEM
SECTION 28 3100
3595001000**

4. Title 3 of the Americans with Disabilities Act
5. Titles 19 and 24 of the California Code of Regulations

1.4 CONTRACTOR QUALIFICATIONS

- A. Fabricator/Installer/Vendor shall be licensed contractor and servicing agent, as well as installer for all components and systems in this System, and be acceptable to manufacturer of the major components of the system. Service personnel shall be capable of serving any and/or all components of the System.
- B. Fabricator/Installer/Vendor must be able to present evidence of technical expertise, be a firm who has successfully installed projects of a similar scope to this project for a minimum of five (5) years, and shall maintain service office within 100 miles of the project site.
- C. All equipment is to be manufactured by a firm/firms who have successfully fabricated elements/systems of a scope similar to this project for a minimum of ten (10) years.
- D. Have a valid State of California Contractor's license in classification C10 - Electrical.
- E. Provide authorized dealer service on-site at facility within four (4) hours of a problem being reported, with this response time available twenty-four (24) hours per day, seven (7) days per week.
- F. Affirm that he maintains, or will maintain, or has access to, a stock of system spares sufficient to ensure that no element of the System will be out of service for more than twenty-four (24) hours due to lack of proper spares.

1.5 SUBMITTALS, O&M'S AND RECORD DRAWINGS

- A. Submittals:
 1. Contractor shall submit name of firm he proposes to do work under this Section, addresses, phone numbers, and name of firm's contact, for approval. Such firms shall be factory authorized representatives of the system and submittal shall include manufacturer's letter of confirmation. Proposed firm shall furnish all equipment and specialty cables, make all connections to same, and place the systems in operation. Such firms shall have offices and service departments within a 100 mile radius of project and shall have been in business of this type for at least five years.
 2. Submittals shall be complete and include catalog data, shop drawings, one-line diagrams, battery calculations, voltage drop calculations, and scaled plan drawings. Building plans shall be 1/8"=1'-0", and site plans shall be no smaller than 1"=40'.
 3. Shop Drawings shall contain complete wiring and schematic diagrams for equipment furnished, equipment layout, conduit and wiring layout drawings, and any other details required to demonstrate that system has been coordinated and will properly function as a unit. Equipment Vendor shall check Drawings for adequacy of conductors and raceways for proposed system. Include in Bid

Amount all required raceways, conductors and material necessary to suit proposed system.

B. Operation and Maintenance Manuals:

1. Operating Instruction Manuals outlining the step-by-step procedures required for system start-up and operations shall be furnished. The instructions shall include manufacturer's name, model number, service manual parts list, and brief description of all equipment and their basic operating features.
2. Maintenance Instruction Manuals outlining maintenance procedures shall be furnished. The manual shall include a troubleshooting guide listing possible breakdowns and repairs and a simplified connection wiring diagram for the system as installed.

C. Record Drawings: Final Inspection will not be made until drawings are received and approved. Record Drawings shall include "As-Built" one-line and wiring diagrams, with terminations identified, wire color coding schedule, pullbox locations, and conduit routing plans.

D. Furnish to District a printed copy of the control panel programming upon completion of final system programming.

E. Performance Test Reports: Upon completion of installed system, submit in booklet form all field tests performed to prove compliance with the specified performance criteria. Each test report shall indicate the final position of controls.

1.6 TRAINING

- A.** Supplier shall demonstrate operation of systems and provide training to all end users, administrative staff, and system administrator. Coordinate times of instruction with District, at District's convenience. Supplier shall provide a minimum of 1 hour of user instructions to clerical staff and 2 hours of user/maintenance instructions to District maintenance personnel. Instruction periods shall not coincide and shall be scheduled with District, not school staff. Deliver to Owner at time of demonstration, all settings and codes programmed into system. Furnish three copies on manufacturer's standard programming worksheets. District shall provide list of authorized personnel for training sessions.

1.7 GUARANTEE

- A.** One firm to assume full responsibility for performance on all work of this section. Guarantee all equipment against defects in material and workmanship for two (2) years, and provide on-the-premises service during normal working hours for two years, at no cost to Owner if trouble is not caused by misuse, abuse, or accident, or at current labor rates if so caused. Provide manufacturer's written one-year guarantee for equipment and parts.
- B.** Service shall normally be available within 24 hours from service department of authorized distributor of manufacturer by factory trained servicemen.

INTRUSION ALARM SYSTEM
SECTION 28 3100
3595001000

- C. On-the-premises service at other than normal working hours to also be available, but labor charges for such calls to be paid by Owner at current labor rates.

PART 2 - DETAIL REQUIREMENTS AND PRODUCTS

2.1 SYSTEM OPERATION

- A. Activation of an intrusion alarm sensor shall cause a signal to be transmitted to a Central Station via telephone lines. Signal transmission shall be initiated by a built-in dialer unit. In addition to alarm reporting, system shall report trouble, low battery, and shunted zone indications.

2.2 SYSTEM DESCRIPTION

- A. A. Intrusion Detection Control Panels: Basis-of-design is the Honeywell VISTA 128BPT System, a burglary/access control/CCTV switching system that includes the following capabilities:
 - 1. Listed for UL Commercial Burglary.
 - 2. Supports up to 128 zones.
 - 3. Supports up to 8 separate partitions.
 - 4. Supports up to 150 users.
 - 5. Supports commercial wireless devices.
 - 6. Provides integrated security, access control, and CCTV switching capability.
 - 7. Provides supervision of peripheral devices.
 - 8. Supports long-range radio (LRR) communication.
 - 9. Provides scheduling capability to allow for automated operations.
 - 10. Supports alarm reporting via Internet.
 - 11. Interfaces with automation software.
 - 12. Monitors smoke detector maintenance signals
 - 13. Capable of being installed using existing wiring

2.3 MANUFACTURER

- A. Intrusion Detection Alarm Panel Manufacturer: System VISTA 128BPT by Honeywell, www.security.honeywell.com.

2.4 SYSTEM PERFORMANCE

- A. Control Panel: Existing control panel shall be verified by contractor to be an 8-partition, UL commercial and burglary control panel that supports up to 128 zones using basic hardwired, polling loop, and wireless zones, RF receivers, and relay modules. The control shall provide the ability to schedule time-driven events, and allow certain operations to be automated by pressing a single button. The system shall be capable of interfacing with an ECP long range radio (LRR) unit that can send Contact ID messages. The control shall provide integrated access control and CCTV-switching capability with the use of a single downloader and database.
1. Basic Hardwired Zones: Control shall provide 8 style-B hardwire zones.
 2. Optional Expansion Zones:
 - a. Polling Loop Expansion: Control shall support up to 120 additional hardwire zones using a built-in two-wire polling (multiplex) loop interface. The polling loop shall provide power and data to remote point modules, and constantly monitor the status of all zones on the loop. Maximum current draw shall not exceed 128 mA.
 - b. Wireless Expansion Zone: Control shall support up to 128 wireless zones using a 5800 series RF receiver (fewer if using hardwire and/or polling loop zones).
 3. Partitions: Control shall provide the ability to operate 8 separate areas, each functioning as if it had its own control.
 4. User Codes: Control shall accommodate 150 user codes, all of which can operate any or all partitions.
 5. Peripheral Devices: Control shall support up to 30 addressable ECP devices, which can be any combination of keypads, RF receivers, relay modules, and interactive phone module.
 6. Keypad/Annunciator: Control shall accommodate up to 16 keypads or six (6) touchscreen (i.e.; advanced user interface) keypads.
 7. Optional Output Relays: A total of 96 relay outputs shall be accommodated using relay modules. Each relay module shall provide four (4) Form C (normally open and normally closed) relays for general-purpose use.

INTRUSION ALARM SYSTEM
SECTION 28 3100
3595001000

8. Optional Vista Interactive Phone Module: The control shall support the ADEMCO 4285/4286 VIP Modules, which permit access to the security system.
9. Integrated Access Control
10. CCTV Switching: System shall be capable of supporting the VistaView 100 CCTV Switching System. The CCTV system shall be fully integrated and be event driven by Burglary or Access events. When cameras are not event driven, they shall be driven by an automatic preset dwell time.
11. Commercial Wireless Equipment: Control shall be compatible with UL Listed Commercial Wireless Security equipment.
12. Optional Keyswitch: Control shall support the ADEMCO 4146 Keyswitch on any one of the system's 8 partitions. If used, zone 7 is no longer available as a protection zone.
13. Voltage Triggers: System shall provide voltage triggers, which change state for different conditions. Used with devices such as a remote keypad sounder or keyswitch ARMED and READY LEDs.
14. Event Log: System shall maintain a log of different event types (enabled in programming). The event log shall provide the following characteristics:
 - a. Stores up to 512 events.
 - b. Viewable at the keypad or through the use of Compass software.
 - c. Printable on a serial printer, including zone alpha descriptors.
15. Scheduling: Provides the following scheduling capabilities:
 - a. Open/close schedules (for control of arming/disarming and reporting).
 - b. Holiday schedules (allows different time windows for open/close schedules).
 - c. Timed events (for activation of relays, auto-bypassing and un-bypassing, autoarming and disarming, etc.).
 - d. Access schedules (for limiting system access to users by time).
 - e. End User Output Programming Mode (provides 20 timers for relay control).
 - f. The system shall automatically adjust for daylight savings time.
16. Communication Features: Supports the following formats and features for the primary and secondary central station receivers:
 - a. Formats: ADEMCO Express; ADEMCO Contact ID 4 and 10 Digit Acct number.
 - b. Backup reporting: The system shall support backup reporting via the following: Secondary phone number; ECP long-range radio (LRR)

- interface; option to select long range radio (LRR) or dialup as the primary reporting method (dynamic signaling feature).
- c. Internet reporting: The system shall be capable of communicating with the central station via the internet using Alarmnet-i. It shall provide the user with the ability to control the system via a browser interface. All packet data transmitted to the monitoring station shall be encrypted with a minimum of 1024 bits of encryption.
- 17. Audio Alarm Verification Option: Provides a programmable Audio Alarm Verification (AAV) option that can be used in conjunction with an output relay to permit voice dialog between an operator at the central station and a person at the premises.
 - 18. Cross-Zoning Capability: Helps prevent false alarms by preventing a zone from going into alarm unless its cross-zone is also faulted within 5 minutes.
 - 19. Exit Error False Alarm Prevention Feature: System shall be capable of differentiating between an actual alarm and an alarm caused by leaving an entry/exit door open.
 - 20. Built-in User's Manual and Descriptor Review: For end-user convenience, the control panel shall contain a built-in User's Manual.
 - 21. Programming: Control shall be capable of being programmed locally or remotely using the ADEMCO Compass Downloader.

2.5 COMPONENTS

- A. Equipment and accessories furnished under the terms of these specifications shall be the standard products of the manufacturers specified or required. All equipment shall be listed by U.L. All equipment and accessories shall be compatible with the system.
 - B. System Integration: System shall integrate with facility doors, windows, and departments. The system shall also integrate with external systems, such as building appliances and building alert systems for remote control and central collection of external system alerts. When integrated with external systems, the system shall connect to the external system to receive status changes by way of a dry contact output from the external system. The system shall use its user interface to provide local status messages from external systems, providing for the initiation of local building policies. Optionally, the system may transmit information to an off-site monitoring service to provide initiation of remote policies when appropriate. The installer shall follow manufacturer's instructions when installing and programming system equipment.
- 1. V-Plex Bus Extensions: Extended system V-Plex bus branch circuits shall be scalable to increase the total size of the bus in larger installations. Branch circuits leading from different buildings or from different floors in multi-story buildings

INTRUSION ALARM SYSTEM
SECTION 28 3100
3595001000

shall be isolated from one another so that a shorted or grounded branch circuit is isolated away from other near-side branch circuits, allowing other V-Plex devices to be isolated so that they can continue to operate.

2. Zone Input: System zone inputs allow the system to sense the change in state of an output from an external device, such as a door/window position sensor, a motion detector, a relay output from an appliance, the output of an external alert system, or other devices that provide a dry closure output.
3. Combined AlarmNet-I (Internet) and AlarmNet-GSM (Global System for Mobile) Fire Alarm Communication: The facility system shall be monitored using both the AlarmNet-I and the AlarmNet-G Communication services. The system shall use Honeywell's AlarmNet IGSMCF Fire Alarm transmitter or equivalent. The communication service shall employ a two-way Internet connection through AlarmNet Communication Service as the primary method of communication, and then the two-way GPRS (General Packet Radio Service) as the secondary means of communication and shall use SMS (Short Message Service) as a tertiary means of communication. The equipment shall be UL listed for use in this application. The installer shall follow manufacturer's instructions when installing the AlarmNet unit.
4. VSI Bus Isolation and Integrity: System V-Plex bus branch circuits shall be isolated from one another so that a shorted, overloaded, or grounded branch circuit is isolated away from other near-side branch circuits, allowing undamaged V-Plex bus circuits to continue to operate. VSI Isolation modules shall be installed at near-side connections to cable runs leading to additional buildings, at cable runs leading to additional floors in multi-story buildings, and at junction boxes leading to multiple VPlex branch circuits within the system. The installer shall use the Honeywell VSI module or equivalent.
5. Zone Input: System zone inputs allow the system to sense the change in state of an output from an external device, such as a door/window position sensor, a motion detector, a relay output from an appliance, the output of an external alert system, or other devices that provide a dry closure output.
6. Door Contact: V-Plex: Honeywell Model 4939SN surface mount sensor.
7. Motion Detector, Wall-Mounted, V-Plex: Honeywell Model DT7500SN V-Plex Dual-Tec Motion Detector.
8. Keypad, Alpha Display: Honeywell Vista 6160 keypad.
9. End of line resistors, as required.
10. Power Supplies: Altronics SMP Series with output voltage and capacity as required. Provide with appropriate transformer, enclosure(s), and battery(s). Battery(s) shall be sized to provide 24 hours of backup power. Provide power supplies as necessary.

11. RJ-31X mounted on Main Telephone Terminal Backboard.
- C. Wiring: The contractor shall provide cables consistent with the manufacturer's recommendations. The following general guidelines shall be followed for wiring installation:
1. Wiring shall be appropriately color-coded with permanent wire markers. Copper conductors shall be used.
 2. All signal cables provided under this contract shall be Class II, plenum-rated cable where required. Where subject to mechanical damage, wiring shall be enclosed in metal conduits or surface metallic raceway.
 3. Data wires shall not be enclosed in conduit or raceways containing AC power wires.
 4. Where EMI may interfere with the proper operation of the DACS circuits, twisted/shielded cable shall be used.

PART 3 - EXECUTION

3.1 INSTALLATION REQUIREMENTS

- A. Work shall be installed as shown on the Drawings in accordance with the manufacturer's diagrams and recommendations, except where otherwise indicated.
- B. Electrical Contractor shall retain the services of the duly appointed representative as specified hereinbefore, who shall furnish all equipment, make all connections to same, and place system in operation. Technician and workman employed shall be particularly skilled in this type of work.
- C. At existing sites, the existing system shall be tested as soon as possible after award of contract and prior to preparing submittals. Contractor shall test entire system to ensure proper operation. Any defects or deficiencies found shall be listed and presented to Owner in letter form. It will be assumed that existing equipment is fully functional unless identified otherwise by Contractor.
- D. Control panel shall be mounted with sufficient clearance for observation and testing.
- E. All junction boxes must be clearly marked for distinct identification.
- F. Panel enclosures shall comply with the Requirements of UL 864. Enclosures having doors over forty-eight inches (48") in height shall be provided with a three (3) point catch and lock; all other doors shall contain a cabinet type cylinder lock. Inserts shall be blind fastened so that no screws show on panel front.
- G. Detectors shall be installed in accordance with manufacturer's written instructions in areas as indicated on the Drawings.
- H. Circuits shall be terminated on screw terminals. Terminal blocks shall be Allen-Bradley Bulletin 1492 with 600 volt screw terminals for #22 to #10 conductors, mounted to type

INTRUSION ALARM SYSTEM
SECTION 28 3100
3595001000

N22 channel, or approved equal. Submittal shall show internal elevation of terminal cabinets with equipment laid out.

- I. All cables shall be run through fanning strip to terminals of terminal blocks.
- J. All cables entering terminal cabinet shall be identified with T&B Vinyl, Brady Permashield mylar markers, or equal. Upon completion of installation, six (6) copies of one-line "as-built" wiring diagram shall be furnished to Architect.
- K. Each cable run on wiring diagram shall be identified with exact wire marker code (numerical or alphabetical) as appears in terminal cabinets.
- L. Detector locations shown on drawings are approximate only. Exact locations shall be coordinated with lighting and mechanical equipment and shall be placed in accordance with manufacturer's recommendations (with respect to supply air diffusers, etc.).
- M. Station locations shall be identified by school's actual room numbers and system shall be programmed accordingly. Coordinate actual room numbers with District. Coordinate final programming with District. Contractor shall furnish a printed copy of final programming to District.
- N. End-of-line resistors shall be installed at locations readily accessible, not above an elevation of 10 feet above finish floor or grade, or as shown on Drawings.
- O. No splices shall occur in underground pullboxes. System wiring shall be continuous, without splices, from terminal cabinet to terminal cabinet and control panel to devices. All interior pullboxes shall be accessible and locations shall be recorded on "As-Built" drawings.
- P. Door contacts shall be located 6" from strike side of door and both the switch and magnet shall be "glued" in place with clear silicone. Wiring shall enter door frame through jamb. Do not drill headers.
- Q. Each detector installed in this contract shall have a popit. Each door contact installed in this contract shall have a popit, unless door contacts are shown grouped on drawings. In rooms with accessible ceilings, mount popit in junction box above ceiling. Where hard ceilings occur, provide flush box high on wall or on ceiling with blank finish plate. Wiring shall go to popits, then down to detectors.
- R. Protected areas accessing remote keypads shall be wired and connected on delay zone, separate from all other protected areas.
- S. After all equipment is installed and is operational, Intrusion Alarm System subcontractor shall set angle settings, sensitivity settings, etc., of each detector to ensure optimum performance and minimal false alarms. Mask out areas of each motion type detector to remove sources of false alarms (windows, heaters, air diffusers, etc.) from detection zones.

3.2 CONSTRUCTION MEETINGS

- A. The Contractor shall schedule construction meetings at the jobsite as follows:

1. Pre-rough-in meeting shall occur before installation of any boxes, raceways, etc. Exact locations of all detectors shall be established as recommended by the Intrusion Alarm System subcontractor.
 2. Prewire meeting shall occur after raceways are installed and prior to pulling of any wire or cable.
 3. Pre-termination meeting shall occur after wire and cable has been installed and prior to termination.
- B. Meetings shall be scheduled by the Contractor on a building by building basis and shall include the Project Inspector, School's Representative, the electrical subcontractor, and the Intrusion Alarm System subcontractor as a minimum.
- C. One-half to three-quarters of the way through project, District Facilities will set up a meeting (preferably at the school site) with decision makers from Facilities, Police Services, Maintenance, Maintenance Alarm Tech, General Contractor, Alarm Sub-contractor, and School Administrator to review the alarm protocol and to identify responsible personnel and timelines.

3.3 TESTS

- A. After all equipment specified herein has been installed and is in operating condition, performance tests shall be conducted to determine that installation and components comply with these specifications.
1. Testing shall be scheduled by the Contractor and shall be conducted at time least disruptive to school activities and as approved by District. Contractor shall provide technicians to conduct all testing (from same firm preparing submittals and performing intrusion alarm work). Testing shall be coordinated to include the Project Inspector and a representative from Engineer's office.
 2. At time of testing, Contractor shall ensure that his submittal will reflect all materials and work necessary to make new equipment function properly with existing.
 3. Contractor shall furnish all instruments and personnel required for tests.
 4. Conduct tests for following:
 - a. Verify that the system is free of grounds or open circuits. The central control board shall indicate when a ground or open circuit exists.
 - b. Verify that devices are functioning as specified.
- B. Testing shall be reconducted to verify correction of any defect found in initial testing.
- C. After system is completely tested, the Contractor shall take the following actions with the Owner:
1. The Contractor will schedule a meeting with the Alarm Sub-contractors and Owner's Representatives to determine alarm zone and device nomenclature. The Contractor shall ensure that the alarm zone and device nomenclature matches

INTRUSION ALARM SYSTEM
SECTION 28 3100
3595001000

the actual building and door or room numbers used by the school. Architectural numbering shall not be used. Once confirmed, the Contractor shall demonstrate this to Owner's Representatives.

- END OF SECTION -

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Engineered fill materials.
 - 2. Imported engineered fill material.
 - 3. Landscape backfill material'
 - 4. Decomposed granite.
 - 5. Aggregate base.

1.2 RELATED REQUIREMENTS

- A. Section 01 5000, Temporary Facilities and Controls.
- B. Section 01 5713, Erosion Control.
- C. Section 01 8113, Sustainable Design Requirements, for CAL-Green **[and Collaborative for High Performance Schools (CHPS)]** general requirements and procedures.
- D. Section 31 2333, Trenching and Backfilling.
- E. Section 32 1200, Asphalt Concrete Paving.
- F. Section 32 1600, Site Concrete.
- G. Section 33 0000, Utilities
- H. Section 33 4000, Storm Drainage Utilities.

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CAL Green), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- C. Local Jurisdiction: Any work within the street, highway or right-of-way shall be performed in accordance with the requirement of the governmental agencies having jurisdiction, and shall not begin until all of those governing authorities have been notified.
- D. ASTM International (ASTM):
 - 1. D698-00 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures, Using 5.5 lb (2.49 Kg) Rammer and 12 inch (304.8 mm) Drop.
 - 2. D1556-00 - Test Method for Density of Soil in Place by the Sand-Cone Method.

**EARTHWORK
SECTION 31 0000
3595001000**

3. D1557-02e2 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 10 lb. (4.54 Kg) Rammer and 18 inch (457 mm) Drop.
4. D3017-05 Test Methods for Moisture Content of Soils and Soil-Aggregate Mixture by Nuclear Methods (Shallow Depth).
5. D422-63(2007) e1 Test Method for Particle Size Analysis of Soil.
6. D4318-05 Test Method for Liquid Limit, Plastic Limit, and Plasticity Limit.

E. CALTRANS Standard Specifications Section 17.

F. CAL-OSHA, Title 8, Section 1590 (e).

1.4 ADMINISTRATION REQUIREMENTS

A. Submittal Procedures:

1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
3. Sustainable Design Submittals shall comply with the additional requirements of Section 01 8113, Sustainable Design Requirements.

B. Site Visitation: All bidders interfacing with existing conditions shall visit the site prior to bid to verify general conditions of improvements. Discrepancies must be reported prior to the bid for clarification.

1.5 ACTION SUBMITTALS

A. Provide supplier's descriptive literature for all products to demonstrate compliance with specified attributes.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Contractor / Installer.

1.7 CLOSEOUT SUBMITTALS

A. Guarantee: Submit subcontractor's guarantee.

1.8 QUALITY ASSURANCE

A. Contractor / Installer shall have been in business for five (5) years providing/finishing similar size projects and complexity.

B. Contractor shall be solely responsible for all subgrades built. Failures resulting from inadequate compaction or moisture content are the responsibility of the contractor. Contractor shall be solely responsible for any and all repairs.

C. The representatives of the Owner's testing lab will not act as supervisor of construction, nor will they direct construction operations. Neither the presence of the Owner's testing

lab representatives nor the testing by the Owner's testing lab shall excuse the contractors or subcontractors for defects discovered in their work during or following completion of the project. Correcting of inadequate compaction or moisture content is the sole responsibility of the contractor.

- D. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.
- E. All materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.
- F. Tests (See Part 3, Article "Testing and Observation" for Compaction Testing).

1.9 DELIVERY, STORAGE AND HANDLING

- A. Transport, store and handle in strict accord with the local jurisdiction.

1.10 FIELD CONDITIONS

1.11 EXISTING SITE CONDITIONS

- A. Contractor shall acquaint himself with all site conditions. If unknown active utilities are encountered during work, notify Architect promptly for instructions. Failure to notify will make Contractor liable for damage to these utilities arising from Contractor's operations subsequent to discovery of such unknown active utilities.
- B. Existing civil, mechanical and electrical improvements are shown on respective site plans to the extent known. Should the Contractor encounter any deviation between actual conditions and those shown, he is to immediately notify the Architect before continuing work.

1.12 ON SITE UTILITY VERIFICATION AND REPAIR PROCEDURES

- A. Ground-breaking requirements:
 - 1. All underground work performed by a Contractor must be authorized by the District's Construction Manager or the Low Voltage Consultant prior to start of construction.
 - 2. The Contractor is to obtain and keep the original School's construction utility site plans on site during all excavation operations. Contractor can contact the District's Construction Manager, Facilities Manager, or the Low Voltage Consultant to procure the drawings.
- B. Underground Utility Locating:
 - 1. The contractor shall hire an Underground Utility Locating Service to locate existing underground utility pathways in areas effected by the scope of work for excavation.
 - 2. Contractor must use an underground utility locator service with a minimum of 3 years experience. The equipment operator must have demonstrated experience.

EARTHWORK
SECTION 31 0000
3595001000

Contact Norcal Underground Locating (800/986-6722) or Precision Locating (800/577-7324)

3. The Underground Utility Locator Service must have the use of equipment with the ability to locate by means of inductive clamping, induction, inductive metal detection, conductive coupling, or TransOnde (Radiodetection) to generate signals, passive locating (free scoping) for "hot" electric, and metal detector.
4. The Underground Utility Locator Service must be able to locate existing utilities at a depth of at least 72".
5. The Underground Utility Locator Service must be able to locate but are not limited to locating the following types of utility pathways:
 - a. All conduit pathways containing 110 volt or greater 50-60Hz electrical wire.
 - b. All conduit pathways containing an active cable TV system.
 - c. All conduit pathways containing wire or conductor in which a signal can be attached and generated without damaging or triggering the existing systems.
 - d. All empty conduit pathways or pipe in which a signal probe or sonde (miniature transmitter) can be inserted.
 - e. All conduit pathways containing non-conductive cables or wires in which a signal probe or sonde (miniature transmitter) can be inserted.
 - f. All plastic and other nonconductive water lines in which a TransOnde Radiodetection) or other "transmitter" can be applied to create a low frequency pressure wave (signal) without damaging or triggering the existing systems.
 - g. All copper or steel waterlines and plastic or steel gas lines.
6. All markings made by the Underground Utility Locator Service or other shall be clear and visible.
7. The contractor shall maintain all markings made by Underground Utility Locator Service or other throughout the entire length of the project.
8. The Underground Utility Locator Service shall provide the contractor with two sets of maps showing the location of utilities and average depth. They will be referenced to permanent buildings. Contractor will deliver one copy to the district at no additional charge.
9. Contractor is responsible to contact Underground Service Alert (U.S.A. 800/227-2600) and receive clearance prior to any excavation operations.
10. Contractor shall inform the (District's Construction Manager)(Architect)(Owner) no later than five (5) days prior to the date scheduled for the utility locator service to be on site.

1.13 PROTECTION

- A. Adequate protection measures shall be provided to protect workmen and passers-by on and off the site. Adjacent property shall be fully protected throughout the operations. Blasting will not be permitted. Prevent damage to adjoining improvements and properties both above and below grade. Restore such improvements to original condition should damage occur. Replace trees and shrubs outside building area disturbed by operations.

**EARTHWORK
SECTION 31 0000
3595001000**

- B. In accordance with generally accepted construction practices, the Contractor shall be solely and completely responsible for working conditions at the job site, including safety of all persons and property during performance of the work. This requirement shall apply continuously and shall not be limited to normal working hours.
- C. Any construction review of the Contractor's performance conducted by the Geotechnical Engineer is not intended to include review of the adequacy of the Contractor's safety measures, in, on, or near the construction site.
- D. Provide shoring, sheeting, sheet piles and or bracing to prevent caving, erosion or gullyng of sides of excavation.
- E. Surface Drainage: Provide for surface drainage during period of construction in manner to avoid creating nuisance to adjacent areas. The contractor shall make a reasonable effort on a daily basis to keep all excavations and the site free from water during entire progress of work, regardless of cause, source, or nature of water.
- F. Adjacent streets and sidewalks shall be kept free of mud, dirt or similar nuisances resulting from earthwork operations.
- G. The site and adjacent influenced areas shall be watered as required to suppress dust nuisance. Dust control measures shall be in accordance with the local jurisdiction.
- H. Trees: Carefully protect existing trees that are to remain. Provide temporary irrigation as necessary to maintain health of trees.

1.14 SEASONAL LIMITS

- A. No fill material shall be placed, spread or rolled during unfavorable weather conditions. When work is interrupted by rains, fill operations shall not be resumed until field tests indicate that moisture content and density of fill are satisfactory.
- B. Excessively wet fill material shall be bladed and aerated per Article "Subgrade Preparation".

1.15 TESTING

- A. General: Refer to Section 01 4523 - TESTING AND INSPECTION SERVICES, AND STRUCTURAL TESTS AND INSPECTIONS LIST, DSA-103.
- B. Geotechnical Engineer: Owner is retaining a Geotechnical Engineer to determine compliance of fill with Specifications, and to direct adjustments in fill operations. Costs of Geotechnical Engineer will be borne by Owner; except those costs incurred for re-tests or re-inspection will be paid by Owner and backcharged to Contractor.
 - 1. If Contractor elects to process or mine onsite materials for use as Suitable Fill, Aggregate Sub Base, Aggregate Base, Rock, Crushed Rock or sand the cost of all testing of this material shall be paid for by the Contractor.
 - 2. Testing of import fill for compliance with Department of Toxic Substance Control (DTSC) shall be paid for by the Contractor.

**EARTHWORK
SECTION 31 0000
3595001000**

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Engineered Fill Materials: All fill shall be of approved local materials supplemented by imported fill if necessary. "Approved" local materials are defined as local soils tested and approved by Geotechnical Engineer free from debris, and concentrations of clay and organics; and contain rocks no larger than 3-inches in greatest dimension. The soil and rock should be thoroughly blended so that all rock is surrounded by soil. This may require mixing of the soil and rock with a dozer prior to placement and compaction. Clods, rocks, hard lumps or cobbles exceeding 3-inches in final size shall not be allowed in the upper 6 inches of any fill. Native clay or clayey soils will not be permitted within the upper 12 inches of building pad areas or paved areas.
- B. Imported Engineered Fill Material: Imported fill may be required to complete work. Proposed import fill material shall meet the above requirements; shall be similar to the native soils. Import fill shall meet the above requirements; shall have plasticity index of 20 or less; an Expansion Index of 15 or less; be free of particles greater than 3-inch (3") in largest dimension; be free of contaminants and have corrosion characteristics within the acceptable limits. All import fill material shall be tested and approved by Soils Engineer prior to transportation to the site. Proposed fill material shall comply with DTSC guidelines to include Phase 1 environmental site assessment and related tests. Refer to the October 2001 DTSC Information Advisory for clean imported fill material.
1. DTSC TESTING: Site work contractor is to coordinate testing with an analytical lab, hired by the owner, licensed by the State of California for the DTSC testing. The costs associated with testing will be paid by the contractor.
 2. DTSC testing shall include documentation as to the previous land use, location, and history. Soils shall be analyzed for all compounds of concern to ensure the imported soil is uncontaminated and acceptable. Testing shall be performed per the recommendations included in DTSC Imported Fill Advisory [http://www.dtsc.ca.gov/Schools/upload/SMP FS Cleanfill-Schools.pdf](http://www.dtsc.ca.gov/Schools/upload/SMP_FS_Cleanfill-Schools.pdf)). Soils shall be tested prior to import to the project site.
 3. Lab shall determine geographically which tests and analysis comparison will be appropriate for the testing. (CAM 17 / Title 22); (RWQCB) Regional Water Quality Control Board; or (OEHHA) Office of Environmental Health Hazard Assessment.
 4. Frequency of testing shall be conducted in accordance with DTSC's Imported Fill Advisory as follows;

Fill Material Sample Schedule	
Area Of Individual Borrow Area	Sampling Requirements
2 Acres or less	Minimum of 4 samples
2 to 4 Acres	Minimum of 1 sample every ½ acre
4 to 10 Acres	Minimum of 8 samples

**EARTHWORK
SECTION 31 0000
3595001000**

Greater than 10 Acres	Minimum of 8 locations with 4 subsamples per location
-----------------------	---

Volume of Borrow Area Stockpile	
Up to 1,000 Cubic Yards	1 sample per 250 cubic yards
1,000 to 5,000 Cubic Yards	4 samples for the first 1000 cubic yards + 1 sample per each additional 500 cubic yards
Greater than 5,000 Cubic Yards	12 samples for the first 5,000 cubic yards + 1 sample per each additional 1,000 cubic yards

5. Reports/ Documentation
 - a. Results of the testing analysis shall be sent to the Owner; Architect; Project Inspector, Project Civil Engineer, DTSC, and DSA. Letter shall reference DSA file and application numbers.
- C. Landscape Backfill Material:
 1. The top 3" of native topsoil stripped from the site may be used for landscape backfill material.
- D. Water: Furnish all required water for construction purposes, including compaction and dust control. Water shall be potable.
- E. Aggregate Base: Provide Class 2 3/4" Aggregate Base conforming to standard gradation as specified in Cal Trans Standard Specifications, Section 26,-1.02A.
- F. Decomposed Granite: Decomposed Granite shall be well graded mixture of fine to 1/8" particles in size with no clods. The material shall be free of vegetation, other soils, debris and rock. The material shall be redish-tan to tan in color.
- G. Decomposed Granite Solidifier: PolyPavement or equal.

PART 3 - EXECUTION

3.1 INSPECTION LAYOUT AND PREPARATION

- A. Prior to installation of the work of this Section, carefully inspect and verify by field measurements that installed work of all other trades is complete to the point were this installation may properly commence
- B. Layout all work, establish grades, locate existing underground utilities, set markers and stakes, setup and maintain barricades and protection facilities; all prior to beginning

**EARTHWORK
SECTION 31 0000
3595001000**

actual earthwork operations. Layout and staking shall be done by a licensed Land Surveyor or Professional Civil Engineer.

- C. Verify that specified items may be installed in accordance with the approved design.
- D. In event of discrepancy, immediately notify Owner and the Architect. Do not proceed in discrepant areas until discrepancies have been fully resolved.

3.2 PERFORMANCE

A. GENERAL:

- 1. General: Do all grading, excavating and cutting necessary to conform finish grade and contours as shown. All cuts shall be made to true surface of subgrade.
- 2. Archaeological Artifacts: Should any artifacts of possible historic interest be encountered during earthwork operations, halt all work in area of discovery and immediately contact the Architect for notification of appropriate authorities.
- 3. Degree of Compaction: Percentage of maximum density, hereinafter specified as degree of compaction required, means density equivalent to that percentage of maximum dry density determined by ASTM D1557 Compaction Test method, and such expressed percentage thereof will be minimum acceptable compaction for specified work.
- 4. Moisture Content: Moisture content shall be as noted below and as called for on the plans. Moisture content shall be maintained until subgrade is covered by surfacing materials.

3.3 DEMOLITION, DISPOSAL AND DISPOSITION OF UNDESIRABLE MAN-MADE FEATURES

- A. All other obstructions, such as abandoned utility lines, septic tanks, concrete foundations, and the like shall be removed from site. Excavations resulting from these removal activities shall be cleaned of all loose materials, dish shaped, and widened as necessary to permit access for compaction equipment. Areas exposed by any required over-excavation should be scarified to a depth of 12", moisture-conditioned to near optimum moisture content, and recompacted to at least 95% of the maximum dry density.

3.4 TESTING AND OBSERVATION

- A. All grading and earthwork operations shall be observed by the Geotechnical Engineer or his representative, serving as the representative of the Owner.
- B. Field compaction tests shall be made by the Geotechnical Engineer or his representative. If moisture content and/or compaction are not satisfactory, Contractor will be required to change equipment or procedure or both, as required to obtain specified moisture or compaction. Notify Geotechnical Engineer at least 48 hours in advance of any filling operation.
- C. Earthwork shall not be performed without the notification or approval of the Geotechnical Engineer or his representative. The Contractor shall notify the Geotechnical Engineer at least two (2) working days prior to commencement of any aspect of the site earthwork.

- D. If the Contractor should fail to meet the compaction or design requirements embodied in this document and on the applicable plans, he shall make the necessary readjustments until all work is deemed satisfactory, as determined by the Geotechnical Engineer or Architect/Engineer.
- E. After each rain event Geotechnical Engineer shall test fill material for optimum moisture. Do not place any fill material until desired moisture is achieved.

3.5 CLEARING AND GRUBBING

- A. Prior to grading, remove all debris off-site. Remove trees and brush including the root systems. Holes resulting from tree and brush removal should be prepared and backfilled in accordance with paragraphs 3.7, 3.8, 3.9, and 3.10. This may require deepening and/or widening the holes to adequately remove disturbed soil and provide room for compaction equipment. Strip the surface of all organics. Strippings meeting the requirements of Section 32 9000 may be used in landscape areas only.

3.6 CUTTING

- A. Building pads that are located within a cut/fill transition area will have to be overexcavated to provide a semi-uniform fill beneath the building pad. The portions of building pads located in cut areas shall be overexcavated to provide no more than 1 foot difference in fill placed in the same building pad.
- B. Do all cutting necessary to bring finish grade to elevations shown on Drawings.
- C. When excavation through roots is necessary, cut roots by hand.
- D. Carefully excavate around existing utilities to avoid unnecessary damage. The contractor shall anticipate and perform hand work near existing utilities as shown on the survey, without additional claims or cost.

3.7 STRUCTURAL EXCAVATION

- A. General: Excavate to bear on firm material at contract depth shown on Structural Drawings.
- B. Footings: All footing excavations shall be of sufficient width for installation of formwork, unless earth will retain its position during concreting. All portions of footings above grade must be formed. In the event that footings are placed against earth, footing widths below grade shall be increased 2 inches from those shown on Drawings and positive protection shall be provided for top corners of trench.
- C. Unsuitable Ground: Any errors in structural excavation, soft ground, or clay soils found when excavating shall be reported to Architect. In no case shall work be built on any such soft or clayey unsuitable surface without direction from the Architect. Restore excavations to proper elevation with engineered fill material compacted to 95% of dry density.

EARTHWORK
SECTION 31 0000
3595001000

3.8 SUBGRADE PREPARATION

- A. Grade compact and finish all subgrades within a tolerance of 0.10' of grades as indicated on Drawings and so as not to pool water. Subgrade within building pads and concrete walks shall be within 0.05' of grades indicated.
- B. After clearing, grubbing and cutting, subsurface shall be plowed or scarified to a depth of at least 12", until surface is free from ruts, hummocks or other uneven features. Moisture condition to 2% above optimum moisture content and recompact to at least 95% of the maximum dry density as determined by ASTM Test Method D1557. If the existing soils are at a water content higher than specified, the contractor shall provide multiple daily aerations by ripping, blading, and/or discing to dry the soils to a moisture content where the specified degree of compaction can be achieved. After seven consecutive working days of daily aerations, and the moisture content of the soil remains higher than specified, the contractor shall notify the architect. If the existing soils have a moisture content lower than specified, the contractor shall scarify, rip, water and blade existing soil to achieve specified moisture content. The contractor shall make proper allowance in schedule and methods to complete this work.
- C. After subgrade for fill within building pad area or within paved areas has been cleared, plowed and scarified, it shall be disked or bladed until uniform and free from large clods, brought to 2% above optimum moisture content and compacted to not less than 95% of maximum dry density, as determined by ASTM Test Method D1557, and such expressed percentage thereof will be minimum acceptable density for specified work.
- D. Subgrade in areas to receive landscaping shall be compacted to (85%).
- E. Where Contractor over-excavates building pads through error, resulting excavation shall be recompacted as engineered fill at Contractor's expense.

3.9 PLACING, SPREADING AND COMPACTING FILL MATERIAL IN BUILDING PAD AND PAVEMENT AREAS

- A. Selected fill material shall be placed in layers which, when compacted, shall not exceed 6 inches in compacted thickness. Each layer shall be spread evenly and thoroughly mixed to insure uniformity in moisture content.
- B. Selected fill material shall be moisture-conditioned to specified moisture content. Selected fill material shall be unfrozen. When moisture content of fill material is below that specified, add water until proper moisture content is achieved. When moisture content is above that specified, aerate by blading or other methods mentioned in 3.08 B until moisture content is satisfactory.
- C. After each layer has been placed, mixed and spread evenly, it shall be thoroughly compacted to a minimum of 90% as determined by the ASTM D1557 Compaction Test. Compact each layer over its entire area until desired density has been obtained.
- D. Recomposition of Fill in Trenches and Compaction of Fill Adjacent to Walls: Where trenches must be excavated, backfill with material excavated. Place in lifts that when compacted do not exceed 6", moisture conditioned to (optimum)(2% above optimum)

moisture content, and compact to a minimum of 90% relative compaction in building pad and paved areas, and to 90% relative compaction in landscape areas.

- E. Jetting of fill materials will not be allowed.

3.10 FINAL SUBGRADE COMPACTION

- A. Building Pads: Upper 12" of all final building pad subgrades (including future buildings) shall be uniformly compacted at specified moisture content to at least 90% of maximum dry density, as determined by ASTM D1557 Compaction Test, regardless of whether final subgrade elevation is attained by filling, excavation, or is left at existing grade. After acceptance of final compaction test, contractor shall maintain the required moisture content of subgrade until concrete flatwork is placed.
- B. Paved Areas: Upper 12" of all final subgrades supporting pavement sections and all other flatwork shall be brought to specified moisture content and shall be uniformly compacted to not less than 95% of maximum dry density, regardless of whether final subgrade elevation is attained by filling, excavation, or is left at existing grade. After acceptance of final compaction test, contractor shall maintain the required moisture content of subgrade until concrete flatwork is placed.
- C. Other Fill and Backfill: Upper 12" of all other final subgrades or finish grades shall be compacted to 90% of maximum dry density.
- D. Gravel Fill: Do not place compacted gravel fill until after underground work and foundations are in place. Compact gravel fill with vibratory plate or similar equipment to preclude settlement.

3.11 PLACING, SPREADING, AND COMPACTION OF LANDSCAPE BACKFILL MATERIALS

- A. All landscaped areas shall receive topsoil. After subgrade under landscape area has been scarified and brought to 85% maximum dry density, top soil shall be placed evenly to depth of 12" at 85% of maximum dry density.
- B. Project Inspector must verify that materials are uniformly spread to minimum depth specified.

3.12 SLOPE CONSTRUCTION

- A. Cut slopes shall be constructed to no steeper than 2:1(horizontal:vertical). Fill slopes shall be constructed to no steeper than 2:1 (horizontal:vertical). Prior to placement of fill on an existing slope the existing slope shall be benched. The benches shall be in a ratio of 2 horizontal to 1 vertical. The face of the fill slopes shall be compacted as the fill is placed, or the slope may be overbuilt and then cut back to the design grade. Compaction by track walking will not be allowed.

3.13 FINISH GRADING

- A. At completion of project, site shall be finished graded, as indicated on Drawings. Finish grades shall be "flat graded" to grades shown on the drawing. Mounding of finish grades

**EARTHWORK
SECTION 31 0000
3595001000**

will not be allowed unless otherwise directed on the landscape drawings. Tolerances for finish grades in drainage swales shall be $\pm 0.05'$. Tie in new and existing finish grades. Leave all landscaped areas in finish condition for lawn seeding. Landscaped planters shall be graded uniformly from edge of planter to inlets. If sod is used for turf areas the finish grade on which it is placed shall be lowered to allow for sod thickness.

- B. All landscape areas shall be left free of rock or foreign material.
- C. All landscape areas shall be approved by Architect prior to any planting.

3.14 SURPLUS MATERIAL

- A. Excavated material not required for grading or backfill shall be removed from site at contractor's expense.

3.15 CLEANING

- A. Refer to Section 01 7700.
- B. Remove from fill all vegetation, wood, form lumber, casual lumber, and shavings, in contact with ground; buried wood will not be permitted in any fill.

END OF SECTION

*s:\master specifications\division 31 - earthwork\31 0000_earthwork.docx
Received from WCEI: June 7, 2018, Updated format: 9-3-21*

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Trench backfill materials.

1.2 RELATED REQUIREMENTS

- A. Section 01 5000, Temporary Facilities and Controls.
- B. Section 01 8113, Sustainable Design Requirements, for CAL-Green general requirements and procedures
- C. Section 31 0000, Earthwork.
- D. Section 32 8000, Irrigation.
- E. Section 33 0000, Utilities
- F. Section 33 4000, Storm Drainage Utilities.

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CAL Green), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- C. California Plumbing Code (CPC), edition as noted on the drawings.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Submittal Procedures:
 - 1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
 - 2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
 - 3. Sustainable Design Submittals shall comply with the additional requirements of Section 01 8113, Sustainable Design Requirements.
- B. Coordination:
 - 1. General Contractor shall coordinate work as herein specified, in accordance with drawings and as required to complete scope of work with all related trades.

TRENCHING AND BACKFILLING
SECTION 31 2333
3595001000

1.5 ACTION SUBMITTALS

- A. Provide supplier's descriptive literature for all products to demonstrate compliance with specified attributes:

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For contractor / Installer.

1.7 CLOSEOUT SUBMITTALS

- A. Guarantee: Submit subcontractor's guarantee.

1.8 QUALITY ASSURANCE

- A. Contractor / Installer shall have been in business for five (5) years providing/finishing similar size projects and complexity.
- B. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.
- C. All materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.

1.9 DELIVERY, STORAGE AND HANDLING

- A. Transport, store and handle in strict accord with the local jurisdiction.

1.10 FIELD CONDITIONS

- A. Contractor shall acquaint himself with all existing site conditions. If unknown active utilities are encountered during work, notify Architect promptly for instructions. Failure to notify will make Contractor liable for damage to these utilities arising from Contractor's operations subsequent to discovery of such unknown active utilities.
- B. Trench dewatering may be necessary. Contractor shall provide any and all tools, equipment and labor necessary for trench dewatering no matter what the source. Dewatering shall be continuous until all site utilities are installed and backfilled.

1.11 PROTECTION

- A. Adequate protection measures shall be provided to protect workers and passers-by on and off the site. Adjacent property shall be fully protected throughout the operations. Blasting will not be permitted. Prevent damage to adjoining improvements and properties both above and below grade. Restore such improvements to original condition should damage occur. Replace trees and shrubs outside building area disturbed by operations. Repair all trenches in grass areas with new sod (seeding not permitted) and "stake-off" for protection.

TRENCHING AND BACKFILLING
SECTION 31 2333
3595001000

- B. Contractor shall be solely and completely responsible for working conditions at the job site, including safety of all persons and property during performance of the work. This requirement shall apply continuously and shall not be limited to normal working hours.
- C. Any construction review of the Contractor's performance conducted by the Architect or Owner is not intended to include review of the adequacy of the Contractor's safety measures, in, on or near the construction site.
- D. Provide shoring, sheeting, sheet piles and or bracing to prevent caving, erosion or gulying of sides of excavation.
- E. Surface Drainage: Provide for surface drainage during period of construction in manner to avoid creating nuisance to adjacent areas. Keep all excavations free from water during entire progress of work, regardless of cause, source or nature of water.
- F. Adjacent streets and sidewalks shall be kept free of mud, dirt or similar nuisances resulting from earthwork operations.
- G. The site and adjacent influenced areas shall be watered as required to suppress dust nuisance.
- H. Trees: Carefully protect existing trees which are to remain.

1.12 TRENCH SAFETY PROVISIONS

- A. General Contractor shall be solely responsible for safety design, construction and coordination with agencies having jurisdiction. If such plan varies from shoring system standards established by Construction Safety Orders, plan shall be prepared by registered civil or structural engineer.
- B. Nothing herein shall be deemed to allow use of shoring, sloping or protective system less effective than that required by Construction Safety Orders of California State Division of Industrial Safety.
- C. When trenching through paved surface, provide steel trench plates to cover open trenches daily until trenches are backfilled.

1.13 SEASONAL LIMITS

- A. No backfill material shall be placed, spread or rolled during unfavorable weather conditions. When work is interrupted by heavy rains, full operations shall not be resumed until field tests indicate that moisture content and density of fill are satisfactory.
- B. Material above optimum moisture shall be processed per Section 31 0000, Part 3, Article "Subgrade Preparation".

1.14 TESTING

- A. General: Refer to Section 31 0000, Part 1, Article "Testing" and Part 3, Article "Testing and Observation".

TRENCHING AND BACKFILLING
SECTION 31 2333
3595001000

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Backfill materials: Pipeline and conduit trench backfill as shown on the plans and as specified below.
 - 1. ¾ inch crush rock.
 - 2. Native Materials: Soil native to Project Site, free of wood, organics, and other deleterious substances. Rocks shall not be greater than 3-inches.
 - 3. Sand: Fine granular material, free of organic matter, mica, loam or clay.
 - 4. Lean Mix Concrete: 3 sacks of cement per yard plus sand.
 - 5. Class 2 aggregate base, ¾" rock, per Caltrans Section 26-1.02B
 - 6. Controlled Density Fill: 3 sack slurry backfill.
- B. Water: Furnish all required water for construction purposes, including compaction and dust control. Water shall be potable.
- C. Provide other bedding and backfill materials as described and specified in Section 33 0000, Section 33 4000 and Divisions 22 and 26.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verification of Conditions:
 - 1. Examine areas and conditions under which work is to be performed.
 - 2. Identify conditions detrimental to proper or timely completion of work and coordinate with General Contractor to rectify.

3.2 INSTALLATION

- A. Perform work in accordance with pipe manufacturer's recommendations, as herein specified and in accordance with drawings.

3.3 TRENCHING

- A. Make all trenches open vertical construction with sufficient width to provide free working space at both sides of trench around installed item as required for caulking, joining, backfilling and compacting; not less than 12 inches wider than pipe or conduit diameter, unless otherwise noted.
- B. Carefully excavate around existing utilities to avoid unnecessary damage. The contractor shall anticipate and perform hand work near existing utilities as shown on the survey, without additional claims or cost.
- C. Trench straight and true to line and grade with bottom smooth and free of edges or rock points.

TRENCHING AND BACKFILLING
SECTION 31 2333
3595001000

- D. Where depths are not shown on the plans, trench to sufficient depth to give minimum fill above top of installed item measured from finish grade above the utility as follows:
1. Sewer pipe: depth to vary
 2. Storm drain pipe: depth to vary
 3. Water pipe - Fire Supply: 36 inches
 4. Water pipe – Domestic Supply: 30 inches

3.4 BACKFILL

- A. Pipe Trench Backfill is divided into three zones:
1. Bedding: Layer of material directly under the pipe upon which the pipe is laid.
 2. Pipe Zone: Backfill from the top of the bedding to 6 inches (compacted) over the top of the pipe.
 3. Upper Zone: Backfill between top of Pipe Zone and to surface of subgrade.
- B. Bedding: Type of material and degree of compaction for bedding backfill shall be as defined in the Details and Specifications.
- C. Pipe Zone and Upper Zone Backfill:
1. Type of material and degree of compaction Pipe Zone and Upper Zone Backfill shall be as required by Drawings, Details, & Specifications.
 2. Upper Zone Backfill shall not be placed until conformance of Bedding and Pipe Zone Backfill with specified compaction test requirements has been confirmed.
 3. Backfill shall be brought up at substantially the same rate on both sides of the pipe and care shall be taken so that the pipe is not floated or displaced. Material shall not be dropped directly on pipe.
- D. Backfill Compaction:
1. Backfill shall be placed in layers which, when compacted shall not exceed 6 inches in thickness. Each layer shall be spread evenly and thoroughly mixed to insure uniformity. Do not backfill over, wet, frozen or soft subgrade surfaces. Employ a placement method that does not disturb or damage foundation walls, perimeter drainage, foundation damp-proofing, waterproofing or protective cover.
 2. When moisture content of fill material is below that required to achieve specified density, add water until proper moisture content is achieved. When moisture content is above that required, aerate by blading or other methods until specified moisture content is met; see Section 31 0000, Part 3, Article "Subgrade Preparation".
 3. After each layer has been placed, mixed and spread evenly, it shall be thoroughly compacted to 95% of maximum dry density while at specified moisture content. Compact each layer over its entire area until desired density has been obtained.
 4. Compaction: All backfill operations shall be observed by the Inspector of Record and/or Geotechnical Engineer. Field density tests shall be made to check compaction of fill material. If densities are not satisfactory, Contractor will be

TRENCHING AND BACKFILLING
SECTION 31 2333
3595001000

required to change equipment or procedure or both, as required to obtain specified densities. Notify Inspector and Architect at least 24 hours in advance of any operation.

E. Backfill in Areas Previously Lime or Cement Treated

1. Where trenching occurs in areas that have been lime or cement treated, class 2 aggregate bases or approved controlled density backfill material shall be used for the top 12-inches minimum of the trench or thickness shall match the depth of treated material.

3.5 TRENCH AND SITE RESTORATION

- A. Finished surface of trenches shall be restored to a condition equal to, or better than the condition as existed prior to excavation work.

3.6 PROTECTION

- A. Protect existing surfaces, structures, and utilities from damage. Protect work by others from damage. In the event of damage, immediately repair or replace to satisfaction of Owner.
- B. Repair existing landscaped areas to as new condition. Replant trees, shrubs or groundcover with existing materials if not damaged or with new materials if required. Replace damaged lawn areas with sod, no seeding will be permitted.
- C. Replace damaged pavement with new compatible matching materials. Concrete walks to be removed to nearest expansion joint and entire panel replaced. Asphalt to be cut neatly and replaced with new materials.
- D. Any existing materials removed or damaged due to trenching to be returned to new condition.

3.7 SURPLUS MATERIAL

- A. Remove excess excavated material, unused materials, damaged or unsuitable materials from site.

3.8 CLEANING

- A. Refer to Section 01 7700.
- B. Contractor will keep the work areas in a clean and safe condition so his rubbish, waste, and debris do not interfere with the work of others throughout the project and at the completion of work.
- C. After completion of work in this section, remove all equipment, materials, and debris. Leave entire area in a neat, clean, acceptable condition.

TRENCHING AND BACKFILLING
SECTION 31 2333
3595001000

END OF SECTION

s:\master specifications\division 31 - earthwork\31 2333_trenching and backfilling.docx
Received from WCEI: October 20, 2012; Updated 9-2-21

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Concrete curbs and gutters.
2. Concrete pavement, sidewalks and ramps.
3. Steel reinforcing for flatwork and curbs.
4. Truncated domes.

1.2 RELATED REQUIREMENTS

- A. Section 01 6116, Volatile Organic Compound (VOC) Restrictions; for VOC limits pertaining to adhesives, sealants, fillers, primers, and coatings.
- B. Section 01 8113, Sustainable Design Requirements, for CAL-Green general requirements and procedures
- C. Division 31, Earthwork.
- D. Section 32 1200, Asphalt Concrete Paving.

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CALGreen), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- C. American Concrete Institute (ACI):
1. 117: Specification for Tolerances for Concrete Construction and Materials and Commentary.
 2. 211.1: Standard Practice for Selecting Proportions for Normal, Heavyweight and Mass Concrete.
 3. 301: Specifications for Structural Concrete.
 4. 302.1R: Guide to Concrete Floor and Slab Construction.
 5. 305R: Guide to Hot Weather Concreting.
 6. 306R: Guide to Cold Weather Concreting.
 7. 308R: Guide to External Curing of Concrete.
 8. 318: Building Code Requirements for Structural Concrete and Commentary.
 9. 347R: Guide to Formwork for Concrete.
- D. ASTM International (ASTM):

1. A615/A615M: Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement.
 2. A706/A706M: Standard Specification for Deformed and Plain Low-Alloy Steel Bars for Concrete Reinforcement.
 3. C33/C33M: Standard Specification for Concrete Aggregates.
 4. C94/C94M: Standard Specification for Ready-Mixed Concrete.
 5. C143/C143M: Standard Test Method for Slump of Hydraulic-Cement Concrete.
 6. C150/C150M: Standard Specification for Portland Cement.
 7. C260/C260M: Standard Specification for Air-Entraining Admixtures for Concrete.
 8. C309: Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete.
 9. C330/C330M: Standard Specification for Lightweight Aggregates for Structural Concrete.
 10. C494/C494M: Standard Specification for Chemical Admixtures for Concrete.
 11. C618: Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete.
 12. C920: Standard Specification for Elastomeric Joint Sealants.
 13. C1107/C1107M: Standard Specification for Packaged Dry, Hydraulic Cement Grout (Non-Shrink).
 14. C1315: Standard Specification for Liquid Membrane-Forming Compounds Having Special Properties for Curing and Sealing Concrete.
 15. D1751: Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types).
 16. D5893/D5893M: Standard Specification for Cold Applied, Single Component, Chemically Curing Silicone Joint Sealant for Portland Cement Concrete Pavements.
- E. Concrete Reinforcing Steel Institute (CRSI):
1. Manual of Standard Practice.
 2. Placing Reinforcing Bars.
- F. State of California, Department of Transportation (Caltrans):
1. Division of Engineering Services:
 - a. California Test 342: Method of Test for Surface Skid Resistance with the California Portable Skid Test.
 2. Standard Specifications.
 - a. Section 51, Concrete Structures.
 - b. Section 52, Reinforcement.
 - c. Section 73, Concrete Curbs and Sidewalks.
 - d. Section 90, Concrete.
- G. US Government General Services Administration (GSA/SAE):

1. GSA/SAE AMS-STD-595A: Colors Used In Government Procurement.

1.4 ADMINISTRATIVE REQUIREMENTS

A. Submittal Procedures:

1. Action Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
3. Sustainable Design Submittals shall comply with the additional requirements of Section 01 8113, Sustainable Design Requirements.

1.5 ACTION SUBMITTALS

A. Shop Drawings: Joint pattern layout for walks and pavement.

B. Product Data:

1. A complete list of materials proposed to be used for the site concrete work including, but not limited to, sand, gravel, admixtures, surface treatments, coloring agents, sealers, cast-in-place accessories, forming and curing products, concrete mix designs, reinforcing materials, joint materials, curing materials, and detectable warning surface.
2. Manufacturer's descriptive literature for products proposed for use. Include installation instructions, and maintenance instructions.

C. Concrete Mix Design: The Contractor shall submit three copies of each proposed mix design for each class of concrete in accordance with ACI 301, Sections 3.9 "Proportioning on the Basis of Previous Field Experience or Trial Mixture," or 3.10 "Proportioning Based on Empirical Data." The Contractor shall submit a separate mix design for concrete to be placed by pumping, in addition to the mix design for concrete to be placed directly from the truck chute.

1. The following information shall be included in the concrete mix design:
 - a. Proportions of cement, fine and coarse aggregate, and water.
 - b. Water-cement ratio, 28-day compressive design strength, slump, and air content.
 - c. Type of cement and aggregate.
 - d. Special requirements for pumping.
 - e. Range of ambient temperature and humidity for which design is valid.
 - f. Special characteristics of mix, which require precautions in mixing, placing, or finishing techniques to achieve specified finished product.
2. Do not begin concrete production until mixes have been reviewed and approved by Engineer.
 - a. Review of mix design by the Architect and Engineer shall in no way relieve the subcontractor of his responsibility for the performance of the concrete.

D. Qualification Data: For manufacturer

- E. Delivery tickets as specified for ready-mixed concrete.
- F. Sustainable Design:
 - 1. General:
 - a. Submit information necessary to establish and document compliance with the California Green Building Standards Code.
 - b. Sustainable design submittals are in addition to other submittals.
 - 2. The following information shall be provided:
 - a. Adhesives and Sealants: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.
 - b. Paints and Coatings: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.

1.6 CLOSEOUT SUBMITTALS

- A. Guarantee: Submit subcontractor's guarantee.

1.7 QUALITY ASSURANCE

- A. Qualifications:
 - 1. Manufacturer of ready-mixed concrete products shall meet ASTM C94/C94M requirements for production facilities and equipment.
- B. Design, erect, support, brace and maintain formwork and shoring to safely support all loads that might be applied until such loads can be carried by concrete.
- C. The Contractor shall perform work in accordance with ACI 301.
- D. Use only new materials and products.
- E. Single-Source Responsibility: Use materials and products of one manufacturer whenever possible.
- F. Materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.
- G. Testing to determine compliance with the work of this Section will be the responsibility of the Contractor.
 - 1. Cement and reinforcing shall be tested in accordance with CBC Section 1910A. Testing of reinforcing may be waived in accordance with Section 1910A.2 when approved by the Engineer and DSA.
 - 2. Testing will be performed by an independent testing and inspecting agency in accordance with Section 01 4523, Testing and Inspection Services, and paid for by the Owner.
 - 3. Refer to Article FIELD QUALITY CONTROL in Part 3 of this Section for additional requirements.

4. Cost of retests and coring due to low strength or defective concrete will be paid by the Owner and back-charged to the Contractor.
- H. Sieve analysis from testing laboratories identifying rock/sand percentages within the concrete mix; or class 2 aggregate base shall have the current Project name and Project location identified on the report. Outdated analytical reports greater than 90 days old will not be accepted.
- I. Mockups: Provide on-site mockup panels for each type of exposed colored concrete flatwork showing texture and color before proceeding with finish to be used on this Project.
 1. Construct sample panels after review and approval of samples.
 2. Size: Minimum 5 feet square and have at least one longitudinal and one transverse joint unless a more specific note indicates otherwise on Drawings.
 3. Construct sample panels at location approved by Architect.
 4. Construct sample panels in ample time to allow for finishing and curing before requesting Architect to review.
 5. Follow procedures used on accepted samples.
 6. Include saw-cut and tooled joints to match method and appearance proposed for use in completed work.
 7. Prepare successive sample panels as required until finish, color, and appearance is approved by Architect.
 8. Do not remove sample panels until authorized in writing by the Architect and all concrete work has been approved.

1.8 DELIVERY, STORAGE AND HANDLING

- A. Deliver undamaged products to job in manufacturer's sealed containers and/or original bundles with tags and labels intact.
- B. Store materials in protected, dry conditions off of ground and in areas so as to not interfere with the progress of the Work.
- C. Transport, store and handle in strict accordance with the manufacturer's written recommendations.
- D. Store cement in weather tight building, permitting easy inspection and identification. Protect from dampness. Lumpy or stale cement will be rejected.
- E. Aggregates: Prevent excessive segregation, or contamination with other materials or other sizes of aggregate. Use only one supply source for each aggregate stock pile.

1.9 FIELD CONDITIONS

- A. Make and be responsible for all field dimensions necessary for proper fitting, slopes, and completion of work. Report discrepancies to Architect before proceeding.
- B. Do not place concrete during rain without adequate protection.

- C. The Contractor shall conform to ACI 306R when mixing and placing concrete during cold weather. Provide sufficient protection when daily temperatures drop below 40 degrees F.
- D. The Contractor shall conform to ACI 305R when mixing and placing concrete during hot weather. When air temperature exceeds 100 degrees F adjust concrete mix with retarding admixture in design mix, and adequately test and take additional measures as directed by concrete supplier.
- E. The Contractor shall maintain access for vehicular and pedestrian traffic as required for other construction activities. Use temporary striping, flagmen, barricades, warning signs, and warning lights as required.
- F. Placing in hot weather: Comply with ACI 305R. Concrete shall be delivered, placed and finished in a sufficiently short period of time to avoid surface dry checking.
 - 1. Concrete shall not exceed 85 degrees F at time of placement.
 - 2. Concrete shall be kept wet continuously after tempering until implementation of curing compound procedure in accordance with this specification.
 - 3. Evaporation Retarder: Apply evaporation retarder to concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 pounds per square foot per hour, before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.
- G. Placing in Cold Weather: Comply with ACI 306R. Protect from frost or freezing. No antifreeze admixtures are permitted.
 - 1. When placing concrete during freezing or near-freezing weather, mix shall have temperature of at least 50 degrees F but not more than 90 degrees F.
 - 2. Concrete shall be maintained at temperature of at least 50 degrees F for not less than 72 hours after placing or until it has thoroughly hardened.
 - 3. Provide necessary thermal coverings for any flat work exposed to freezing temperatures.

PART 2 - PRODUCTS

2.1 DESIGN AND PERFORMANCE CRITERIA

- A. Contractor shall comply with requirements applicable to this Section for concrete materials, admixtures, bonding materials, curing materials, surface sealers and others as required.
- B. Concrete walking surfaces shall have a coefficient of friction not less than 0.30 and will be subject to testing to verify compliance as specified in Article FIELD QUALITY CONTROL.
 - 1. The coefficient of friction will be measured by California Test 342 before pavement is opened to public traffic, but not sooner than 7 days after concrete placement.

2. Contractor shall notify the Architect and Project Inspector of pavement having a coefficient of friction less than 0.30.
- C. Sustainable Design:
1. VOC emissions for field-applied adhesives, sealants, and sealant primers must comply with limits specified in Section 01 6116.
 2. VOC emissions for field-applied paints and coatings must comply with limits specified in Section 01 6116.

2.2 FORMING MATERIALS

- A. Form Material: Steel, wood, or other suitable material of size and strength to resist movement during concrete placement and to retain horizontal and vertical alignment until removal. Use straight forms, free of distortion and defects. Use flexible spring steel forms or laminated boards to form radius bends as required. The forms shall be of a depth equal to the depth of curbing or sidewalk, and so designed as to permit secure fastening together at the tops. Coat forms with non-staining type coating that will not discolor or deface surface of concrete.
1. Concrete Exposed to View: 5/8-inch minimum APA B-B Plyform, steel or "Sonotube" forms by Sunoco, 888-875-8754, or equal.
 2. Concrete Concealed from View: 5/8-inch minimum APA B-B Plyform, steel or 1 x 8 DF, Number 2 Grade or better.
- B. Form Ties: Snap off metal of fixed length, leaving no metal within 1-1/2 inches of surface and no fractures, spalls or other surface defects larger than 1 inch diameter; manufactured by Burke, Dayton Superior, or equal.
- C. Spreaders: Metal. Wood is not permitted.
- D. Form Coating: Coat forms with non-staining material that will not discolor or deface surface of concrete or leave any residue on concrete that would interfere with surface coating as approved by the Architect.
- E. Chamfer Strips: Rigid polyvinyl chloride, 3/4-inch x 3/4-inch, in maximum possible lengths, manufactured by Burke, Greenstreak, Vulco, or equal.

2.3 REINFORCING MATERIALS

- A. Reinforcement Bars: New billet steel deformed bars conforming to requirements of ASTM A615/A615M or ASTM A706/A706M; Grade 60.
1. Bars for dowels installed through expansion joints or construction joints to existing sidewalks or concrete features shall be smooth or if deformed shall be sleeved on one end for slippage.
- B. Reinforcing Supports: Galvanized metal chairs or spacers or metal hangers, accurately placed 3 feet on center each way, staggered, with each support securely fastened to steel reinforcement in place.

1. Bottom bars in footings may be supported with 3-inch concrete blocks with embedded wire ties.
2. Concrete supports without wire ties will not be allowed.

2.4 CONCRETE MATERIALS

- A. Cement: Portland cement in accordance with ASTM C150/C150M, Type II, low alkali.
- B. Concrete Aggregates: Graded from coarse to fine in accordance with ASTM C33/C33M.
 1. Normal Weight Aggregates: Clean and free from deleterious coatings, clay balls, roots, and other extraneous materials, and in conformance with ASTM C33/C33M, except as otherwise specified. Combined grading shall meet limits of ASTM C33/C33M.
 - a. Size: Not be larger than one-fifth of the narrowest dimension between forms, or larger than three-fourths of the minimum clear spacing between reinforcing bars.
 2. Lightweight Aggregates:
 - a. General: Durable particles suitably processed, washed and screened without adherent coatings, free of materials with deleterious reactivity to alkali in cement, and conforming to ASTM C330/C330M.
 - b. Fine aggregate shall be natural sand, or sand prepared from stone or gravel, with grains free of silt, loam and clay.
- C. Water: Potable, clean, and in accordance with ASTM C94/C94M, free from injurious amounts of oil, acids, alkalis, salts, scale, organic materials or other deleterious matter, and in compliance with ACI 318 Section 26.4.1.3.
- D. Fly Ash: Western Fly Ash, conforming to ASTM C618 for Class N or Class F materials and in accordance with CBC Section 1903A.6.
 1. Class C is not permitted.
 2. Proportions: Not more than 15 percent (by weight) may be substituted for portland cement.

2.5 ADMIXTURES

- A. Water Reducing Admixture: Admixture to improve placing, reduce water cement ratio and ultimate shrinkage; "WRDA 64" by GCP Applied Technologies, or equal conforming to ASTM C494/C494M and ACI 318 Section 3.6.
 1. Water reducing admixture may be used subject to prior approval by the Architect, Engineer, and the Testing Lab.
 2. Proposed product and quantity shall be included in original design mix.
- B. Air-Entraining Admixture: "Daravair 1000" by GCP Applied Technologies or equal conforming to ASTM C260 and ACI 318, section 26.4.1.4.
 1. Proportion air entraining concrete to attain specified minimum 28-day compressive strength.

2. Total air entrainment in concrete shall be not less than 4 percent or more than 6 percent of the volume of concrete.
- C. Glare Reduction Colorant: Concentrated pigment dispersions designed to permanently color concrete; "Chromix L10 Base-Black" by Sika Corporation, or equal. *Was within 2.2 H.1*

2.6 CURING MATERIALS

- A. Clear Curing Compound: Water-based membrane-forming concrete curing compound in accordance with ASTM C309 and C1315; "Aqua Resin Cure Clear" by Burke CO, "1100" by W.R. Meadows, or equal.

2.7 ADDITIONAL MATERIALS AND COMPONENTS

- A. Concrete Bonding Agent: The following, or equal, conforming to ASTM C1059/C1059M.
 1. "Weld-Crete" by Larson Products Corporation, 800-633-6668.
 2. "Daraweld C" by GCP Applied Technologies, 877-423-6491.
- B. Patching Mortar: One-component, trowel applied, migrating-corrosion-inhibitor enhanced, polymer-modified, shrinkage-compensated, fiber reinforced, micro-silica enhanced, cementitious repair mortar for horizontal, vertical, and overhead applications; "Meadow-Crete GPS" by W.R. Meadows, or equal.
- C. Non-Shrink Grout: Premixed, non-metallic, no chlorides, non-staining and non-shrinking conforming to ASTM C1107/C1107M; "MasterFlow 713" by Master Builders Solutions, a division of BASF, 800-433-9517, or equal.
- D. Drainage Rock Base: 3/4-inch aggregate size conforming to Class 2 Aggregate Base as defined in Caltrans Standard Specifications Section 26, or equal clean free-draining gravel or crushed rock as recommended by the Geotechnical Engineer.
- E. Expansion Joint Material: Preformed 3/8-inch fiber material, with bituminous binder manufactured for use as concrete expansion joint material and conforming to ASTM D1751 and approved by Architect.
 1. Furnish joint fillers in one-piece lengths for full width being placed, wherever possible. Where more than one length is required, lace or clip joint-filler sections together.
- F. Joint Sealant for Expansion Joints in Concrete: Weather and UV resistant, single component, cold applied silicone sealant, Type S, conforming to ASTM D5893/D5893M; ASTM C920, Grade P, Class 25, Use T.
 1. Self-Leveling: "DOWSIL 890-SL Silicone Joint Sealant" by Dow Chemical Company, or equal.
 2. At Slopes Exceeding 5 Percent: Non-sagging; "DOWSIL 888 Silicone Joint Sealant" by Dow Chemical Company, or equal.
 3. Color: As standard with manufacturer.

- G. Pre-Formed Plastic Expansion Joint Caps: Polystyrene, with removable tops; "Snap Cap" by W. R. Meadows, Tex-Trude expansion caps, or equal.
- H. Truncated Domes: Vitrified Polymer Composite (VPC) cast-in-place detectable/tactile warning surface tiles complying with Americans with Disabilities Act (ADA) and the California Code of Regulations (CCR) Title 24, Part 2, Chapter 11B; "Armor-Tile", "Access Tile Tactile Systems," or equal.
 - 1. Color: Shall be yellow and approximate 33538 of GSA/SAE AMS-STD-595A in accordance with CBC Section 11B-705.1.1.3.1.
- I. Traffic Paint for Accessibility Striping at Stairs: VOC compliant, water-based, vinyl acrylic copolymer fast drying emulsion and specifically formulated as a traffic marking paint; "Setfast" with "Duckback" abrasive additive by Sherwin-Williams, "SAFE-STRIDE" by Wooster Products, Inc., or equal.
 - 1. Colors: As selected by Architect. [Yellow]
- J. Cast Abrasive Accessibility Strips and Stairs: Extruded aluminum with integral anchor and filled with abrasive granules in epoxy binder; Model ST-SF-N by Nystrom, Inc., 800-547-2635, Type T-24 by American Safety Tread Company, Inc., 800-245-4881, Type WP-24A by Wooster Products, Inc., 330-264-2844, or equal.
 - 1. Colors: As selected by Architect. [Yellow]

2.8 CONCRETE DESIGN AND CLASS

- A. Designed Strength and Classes of Concrete: The following mixes are not applicable to concrete items exceeding 4 feet in height above the adjacent grade.
 - 1. Class "B": Concrete shall have 1 inch maximum size aggregate, shall have 3000 pounds per square inch minimum at 28 day strength with a maximum water to cementitious ratio no greater than 0.50.
 - a. Location of Use: Exterior slabs, including walks, vehicular paved surfaces, manhole bases, poured-in-place drop inlets, curbs, valley gutters, curb and gutter, and other concrete of like nature.
 - 2. Class "D" concrete of 1 inch maximum size aggregate shall have 3500 pounds per square inch 28 day strength with a maximum water to cementitious materials ratio of 0.55.
 - a. Location of Use: Footings and retaining walls not attached to buildings, and planter walls, monument signs, and other site concrete not described for use in Class "B".
- B. Slump Limits: Provide concrete, at point of final discharge of proper consistency as tested in accordance with ASTM C143/C143M with slumps of 4 inches, plus or minus 1 inch.
- C. Mix Design: Concrete shall be designed for strength in accordance with provisions of CBC Section 1905A.

1. Should the Contractor desire to pump concrete, a modified mix design will need to be submitted for review.
 2. Fly ash may be used in concrete to improve workability in amounts up to 15 percent of the total cementitious weight.
- D. Air Entrainment: Provide at concrete paving / flatwork, including concrete ramps and stairs in accordance with local jurisdiction minimum requirements, but no less than 3 percent of the volume of concrete.
- E. Glare Reduction Additive:
1. General:
 - a. Provide at exterior concrete slabs, walks, ramps, stairs, including bleachers, and other exposed flatwork to eliminate glare.
 - b. Omit glare reduction colorant where color hardener, integral color, and stain treatment of concrete are scheduled.
 2. Quantity: As required to match approved sample but not exceed 2 pounds of colorant per cubic yard of concrete.
 3. Add colorant to mix in accordance with manufacturer's printed instructions.
- F. Coloring Agent:
1. Quantity: Add pigment as required to result in hardened concrete color consistent with approved sample but not exceeding maximum dosage per sack of cement as recommended by manufacturer based on total cementitious materials of mix design.
 2. Add pre-mixed colorant bags to mix in accordance with manufacturer's printed instructions.

2.9 MIXING OF CONCRETE

- A. Conform to requirements of CBC Chapter 19A.
- B. Concrete shall be mixed until there is uniform distribution of material and mass is uniform and homogenous; mixer must be discharged completely before the mixer is recharged.
- C. Concrete shall be Ready-Mixed Concrete: Mix and deliver in accordance with the requirements set forth in ASTM C94/C94M and ACI 301. Batch Plant inspection may be waived in accordance with CBC Section 1705A.3.3, when approved by the Project Engineer and DSA.
1. Furnish batch certificates for each batch discharged and used in the work.
 2. Approved Testing Laboratory shall check the first batching at the start of the work and furnish mix proportions to the Licensed Weighmaster.
 3. Licensed Weighmaster shall identify materials as to quantity and to certify to each load by ticket.
 4. Delivery tickets are to accompany each truck and shall be kept in the job superintendent's file. Delivery tickets must indicate the following information or be subject to rejection:

- a. Name of Project.
 - b. Supplier of concrete.
 - c. Truck identity and ticket serial number.
 - d. Date of delivery.
 - e. Brand of cement.
 - f. Cement content.
 - g. Strength classification.
 - h. Batching time.
 - i. Point of deposit.
 - j. Total amount of water.
 - k. Weight of aggregate.
 - l. Daily temperature.
 - m. Number of cubic yards in load.
 - n. Admixture content.
 - o. Name of Contractor.
 - p. Name of driver.
 - q. Time loaded and first mixing of concrete.
 - r. Reading of revolution counter.
 - s. Color additive.
5. Ticket shall be transmitted to Project Inspector by truck driver with load identified thereon. Project Inspector will not accept load without load ticket identifying mix and will keep daily record of pours, identifying each truck, its load and time of receipt, and will transmit two copies of record to DSA.
6. At end of project, Weighmaster shall furnish affidavit to DSA on form satisfactory to DSA, certifying that all concrete furnished is in conformance with proportions established by mix designs.
7. Placement of concrete shall occur as rapidly as possible after batching and in a manner which will assure that the required quality of the concrete is maintained. In no case may concrete be placed more than 90 minutes from batch time.
- a. When air temperature is between 85 and 90 degrees F, reduce maximum batching to discharge time from 90 minutes to 75 minutes.
 - b. When air temperature is above 90 degrees F, reduce maximum batching to discharge time to 60 minutes.
8. Water may be added to the mix only if neither the maximum permissible water-cement ratio nor the maximum slump is exceeded.
- a. The quantity of water used for each batch shall be accurately measured.
 - b. In no case shall more than 10 gallons of water be added to a full 9-yard load, or 1 gallon per yard on remaining concrete within the drum, providing load tag indicates at time of mixing at plant an allowance for additional water.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Confirm general layout, grade, and joint pattern layout with the Architect prior to placing concrete.
- B. Verify that gradients and elevations of the base are correct, and that the base is dry.
- C. Contractor shall report in writing to the Architect prevailing conditions that will adversely affect satisfactory execution of the work of this Section.
 - 1. Do not proceed with work until unsatisfactory conditions have been corrected.
- D. Forms and reinforcements are subject to approval by the Project Inspector as specified in Article FIELD QUALITY CONTROL.

3.2 PREPARATION

- A. Remove frost, water, and other foreign materials from form surfaces, reinforcement, and embedded items against which concrete will be placed.
- B. When the ambient temperature necessitates the use of cold or hot weather concreting, make provisions in advance of concrete placement.
- C. Before placing concrete, clean tools and equipment, and remove debris from areas to receive concrete.
- D. Clean reinforcing and other embedded items of coatings, oil, mud and soil that may impair bond with concrete.
- E. Slab-On-Grade: After subgrade has been approved by Geotechnical Engineer, install specified drainage rock base material to thickness shown. Rock base shall be implemented and compacted in accordance with the Geotechnical Report and recommendations of the Geotechnical Engineer.

3.3 INSTALLATION – FORMWORK

- A. Form material shall be straight, true, sound and able to withstand deformation due to loading and effects of moist curing. Materials which have warped or delaminated, or require more than minor patching of contact surfaces, shall not be reused.
- B. Build forms to shapes, lines, grades and dimensions indicated. Construct formwork to maintain tolerances required by ACI 301. Forms shall be substantial, tight to prevent leakage of concrete, and properly braced and tied together to maintain position and shape. Butt joints tightly and locate on solid backing. Chamfer corners where indicated. Form bevels, grooves and recesses to neat, straight lines. Construct forms for easy removal without hammering, wedging or prying against concrete.
- C. Space clamps, ties, hangers and other form accessories so that working capacities are not exceeded by loads imposed from concrete or concreting operations.

- D. Build openings into vertical forms at regular intervals if necessary to facilitate concrete placement, and at bottoms of forms to permit cleaning and inspection.
- E. Build in securely braced temporary bulkheads, keyed as required, at planned locations of construction joints.
- F. Before placement of reinforcing steel, coat faces of all forms to prevent absorption of moisture from concrete and to facilitate removal of forms. Apply specified material in conformance with manufacturer's written directions.
 - 1. Seal all cut edges.
 - 2. Before re-using form material, inspect, clean thoroughly, and recoat.
- G. Slope tie-wires downward to outside of wall.
- H. Brace, anchor and support all cast-in items to prevent displacement or distortion.
- I. During and immediately after concrete placing, tighten forms, posts and shores. Readjust to maintain grades, levels and camber.
- J. Concrete Paving, Curbs, Curb and Gutters, Ramps:
 - 1. Expansion Joints: Install at locations indicated, and so that maximum distance between joints is 20 feet for exterior concrete unless otherwise shown. Expansion joint material shall be full depth of concrete section. Recess for snap cap and sealant when required.
 - 2. Curbs, Valley Gutter, and Curb & Gutter: Install expansion joints at 60 feet on center, except when placing adjacent to concrete walks, the expansion joints shall align with the expansion joints shown for the concrete walks. Expansion joint material shall be full depth of concrete section. Recess for snap cap and sealant when required.
 - 3. Isolation Joints: 3/8-inch felt between walls and exterior slabs or walks so that paved areas are isolated from all vertical features, unless specifically noted otherwise on plans.
 - 4. Exterior Concrete Paving: Install expansion joints at 20 feet on center maximum, both directions, unless shown otherwise on plans.
 - 5. Ramps: Whether shown or not, all ramps shall have control joints and expansion joints.
 - a. Control joints on ramps shall be aligned and placed in between the vertical posts for the handrails. The curbs, if required shall have control joints that align with the handrail posts.
 - b. Expansion joints shall be placed at the upper, intermediate, and bottom landings.
- K. Inspection: Refer to Article FIELD QUALITY CONTROL.

3.4 INSTALLATION – REINFORCING

- A. General: Reinforcing shall be accurately placed at locations indicated on the drawings within required tolerances and providing required clearances. Reinforcement shall be

secured prior to placement of concrete such that tolerances and clearances are maintained. Coverage shall be in accordance with Section 1907A.7 of the CBC.

1. Reinforcement must be in place before concreting is begun.
 2. Keep a person on the job to maintain position of reinforcing as concrete is placed.
 3. All expansion and construction joints in concrete shall have dowels of size and spacing as shown on the Drawings, or as approved by Architect.
 4. Give notice whenever pipes, conduits, sleeves, and other construction interferes with placement; obtain method of procedure to resolve interferences.
- B. Additional reinforcing steel shall be placed around all utility boxes, valve boxes, manhole frames and covers that are located within the concrete placements.
1. The bars shall be placed so that there will be a minimum of 1-1/2-inch clearance and a maximum of 3-inch clearance. The reinforcing steel shall be placed mid-depth of concrete slab.
- C. At right angles or intersections of concrete walks, additional 2 feet x 2 feet #5, 90 degree bars shall be added at all inside corners for additional crack control. The bars shall be placed 2 inches from concrete forms and supports, at mid-depth of slab.
- D. Reinforcing steel shall be adequately supported by approved devices on centers close enough to prevent any sagging.
- E. Placing Tolerances:
1. In accordance with ACI 301 or CRSI/WCRSI Recommended Practice for Placing Reinforcing Bars, unless otherwise shown.
 2. Clear distance between parallel bars in a layer shall be no less than 1 inch, the maximum bar diameter shall not exceed 1-1/2 times the maximum size of coarse aggregate.
- F. Splices:
1. General: Unless otherwise shown on drawings, splice top reinforcing at midspan between supports, splice bottom reinforcing at supports, and stagger splices. Bar laps shall be wired together. Reinforcing steel laps shall be as follows:
 - a. Length of Lap Splices in Concrete:
 - 1) No. 4 bar: 24 inches minimum.
 - 2) No. 5 Bar: Not less than 62 bar diameters.
 - 3) No. 6 Bar: 56 inches minimum.
 - 4) No. 7 Bars and Larger: Not less than 93 bar diameters.
 - b. All splices shall be staggered at 5 feet minimum from adjacent splices.
- G. Inspection: Refer to Article FIELD QUALITY CONTROL.

3.5 PLACING OF CONCRETE – GENERAL

- A. Adjacent finish surfaces shall be protected at all times during the concrete pour and finishing. Verify that all formwork is tight and leak-proof before concrete is poured. Finish work defaced during the concrete pour and finishing shall be replaced at no extra cost to Owner.
- B. Remove wood chips, sawdust, dirt, loose concrete and other debris just before concrete is to be poured. Use compressed air for inaccessible areas. Remove all standing water from excavations.
- C. Transport concrete from mixer to place of final deposit as rapidly as practicable by methods which will prevent separation or loss of ingredients. Deposit as close as practicable in final position to avoid re-handling or flowing. Partially hardened concrete must not be deposited in work. Concrete shall not be wheeled directly on top of reinforcing steel.
- D. Keep excavations free of standing water, but moisture condition sub-grade before concrete placement.
- E. Placing: Once started, continue concrete pour continuously until section is complete between predetermined construction joints. Prevent splashing of concrete onto adjacent forms or reinforcement and remove such accumulation of hardened or partially hardened concrete from forms or reinforcement before work proceeds in that area. Free fall of concrete shall not to exceed 4'-0" in height. If necessary, provide lower openings in forms to inject concrete and to reduce fall height.
- F. Remove form spreaders as placing of concrete progresses.
- G. Place footings as monolithic and in one continuous pour.
- H. Compacting: Concrete shall be compacted by mechanical vibrators.
 - 1. Concrete shall be thoroughly worked around reinforcement and embedded fixtures and into corners of forms.
 - 2. Vibrating shall not be applied to concrete which has already begun to initially set or be continued so long as to cause segregation of materials.

3.6 REMOVAL OF FORMS

- A. Remove without damage to concrete surfaces.
 - 1. Sequence and timing of form removal shall insure complete safety of concrete structure.
 - 2. Forms shall remain in place for not less than the following periods of time. These periods represent cumulative number of days during which temperature of air in contact with concrete is 60 degrees F and above.
 - a. Vertical Forms of Foundations, Walls and All Other Forms Not Covered Below: 5 days.
 - b. Concrete Paving Edge Screeds or Forms: 7 days.

3. Concrete shall not be subjected to superimposed loads (structure or construction equipment) until it has attained its full design strength and not for a period of at least 21 days after placing. Concrete systems shall not be subjected to construction loads in excess of design loads.
- B. Patching: Install specified patching mortar per manufacturer's recommendations. Repairs to defective concrete which affect the strength of any structural concrete member or component are subject to approval by the architect and DSA.

3.7 CONCRETE PAVING

- A. Concrete paving shall be formed and finished to required line and grades true and flat with a maximum tolerance of 1/8-inch in 10 feet for flatness and to slopes indicated.
- B. Concrete vibrator shall be used to assist concrete placement. Contractor shall have spare concrete vibrator on site during concrete placement.
- C. Thoroughly water and soak the subgrade of exterior concrete paving, curbs, curb and gutters, with multiple daily waterings for at least three days or as required to achieve required moisture content prior to the concrete pour in order to place the subgrade soils in full expansion.
 1. Provide damming as required to keep standing water within the formed area and to allow for proper saturation and full expansion of the subgrade soils.
 2. Remove standing water before concrete placement.
- D. Construction Joints:
 1. Keep exposed concrete face of construction joints continuously moist from time of initial set until placing of concrete; thoroughly clean contact surface by chipping entire surface not earlier than 5 days after initial pour to expose clean hard aggregate solidly embedded, or by approved method that will assure equal bond, such as green cutting.
 2. If contact surface becomes contaminated with soil, sawdust or other foreign matter, clean entire surface and re-chip entire surface to assure proper adhesion.

3.8 FINISHING

- A. Concrete Paving: Finish surface as required by ACI 302.1R using manual and vibrating screeds to place concrete level and smooth.
 1. Under no circumstances shall water be added to the top surface of freshly placed concrete.
 2. Use "jitterbugs" or other special tools designed for the purpose of forcing the course aggregate below the surface leaving a thick layer of mortar 1 inch in thickness.
 3. After tamping the concrete, wood float surface to a true and even plane.
 4. After floating with a wood bull float, make 2 passes with a steel Fresno trowel to start sealing the concrete surface.

5. While concrete is still wet but sufficiently hardened to bear a persons' weight on knee boards, start troweling with a steel hand trowel or a machine trowel in larger areas. Use sufficient pressure to bring moisture to surface.
 6. After surface moisture has disappeared, finish concrete utilizing steel, hand or power trowel.
 7. Completed surface shall be free from trowel marks, depressions, ridges or other blemishes. Tolerance for flatness shall be 1/8-inch in 10 feet.
 8. Provide final finish as follows, unless otherwise indicated:
 - a. Medium Broom Finish: Typical finish to be used at all exterior walks, stairs and ramps. Brooming direction shall run perpendicular to slope to form non-slip surface.
- B. Curb Finish: Steel trowel.
- C. Joints and Edges:
1. Mark-off exposed joints, where indicated, with 1/4-inch radius x 1 inch deep jointer or edging tool. Joints shall be clean, cut straight and parallel or square with respect to concrete walk edge.
 2. Tool edges of control joints, walk edges, and wherever concrete walk adjoins other material or vertical surfaces. Expansion joints shall be constructed as detailed on plans.
 3. The expansion joints shall be full depth as shown in the Drawings. Failure to do so will result in non-compliance and shall be immediately machine cut by the Contractor at its expense.

3.9 CURING

- A. Formed Concrete:
1. Keep forms and top on concrete between forms continuously wet until removal of forms, 7 days minimum.
 2. Maintain exposed concrete in a continuous wet condition for 14 days following removal of forms.
- B. Concrete Paving, Curb, Curb and Gutter, Valley Gutter:
1. Cure utilizing curing compound. If applicable, the Contractor shall verify that the approved curing compound is compatible with the approved colorant system.
 2. Curing compound shall be applied in a wet puddling application. Spotty applications shall be reason for rejection and possibly concrete removal and replacement at the contractor's expense with no compensation from the Owner.
- C. No curing compound shall be applied to areas scheduled to receive resilient track surface including, curbs, ramps, runways, and similar items.

3.10 DEFECTIVE CONCRETE

- A. General:

1. Determination of defective concrete shall be made by the Architect or Engineer whose opinion shall be final in identifying areas to be replaced, repaired or patched.
2. As directed by Architect, cut out and replace defective concrete.
 - a. Defective concrete shall be removed from the site.
 - b. No patching is to be done until surfaces have been examined by Architect and permission to begin patching has been provided.
 - c. Permission to patch an area shall not be considered waiver of right by the Owner to require removal of defective work, if patching does not, in opinion of Architect, satisfactorily restore quality and appearance of surface.
 - d. Remove and replace concrete if repair to an acceptable condition is not feasible.

B. Defective Concrete Is:

1. Concrete that does not match the approved mix design for the given installation type.
2. Concrete not meeting specified 28-day strength.
3. Concrete which contains rock pockets, voids, spalls, transverse cracks, exposed reinforcing, or other such defects which adversely affect strength, durability or appearance.
4. Concrete which is incorrectly formed, out of alignment or not plumb or level, or outside of the maximum tolerance for flatness and slopes indicated.
5. Concrete containing embedded wood or debris.
6. Concrete having large or excessive patched voids which were not completed under Architect's direction.
7. Concrete not containing required embedded items.
8. Concrete with excessive shrinkage, transverse cracking, crazing, curling; or defective finish.
9. Concrete that is unsuitable for placement or has set in truck drum for longer than 90 minutes from the time it was batched.
10. Concrete where expansion joint filler that is not isolating the full depth of the concrete section, and not recessed as required for backer rod and sealant where required.
11. Concrete that is excessively wet or excessively dry and will not meet the minimum or maximum slump required per mix design.
12. Finished concrete with oil stains from equipment use, and or rust spots that cannot be removed.
13. Concrete with control joints (weakened planed joints) that do not meet the required minimum depth shown on the drawings.
14. Concrete not meeting slip-resistance requirements.

C. Flatwork: The Owner reserves the right to survey the flatwork, to determine if flatwork is outside of the maximum tolerance for flatness and slopes as indicated.

1. If the flatwork is found to be out of tolerance, then the Contractor is required to replace concrete at no additional expense to the Owner.
2. Determination of flatwork flatness, surveying and remedial work must be completed far enough in advance so that the project schedule is maintained, delays are avoided, and the new flatwork or flatwork repairs are properly cured.
3. The Contractor will be responsible for reimbursing the Owner for costs associated with re-surveying to verify compliance of work remediated by the Contractor.

3.11 SEALANT

- A. Apply sealant in compliance with manufacturer's instructions, using hand guns or pressure equipment with proper nozzle size, on clean, dry, properly prepared substrates.
- B. Force sealants into joint against sides of joint to make uniform. Avoid pulling of the sealant from the sides. Fill sealant space completely with sealant.
- C. Finished joints shall be straight, uniform, smooth, and neatly finished.
- D. Remove any excess sealant from adjacent surfaces of joints utilizing the manufacturer's recommended solvent and cleaning processes. Leave the work in a neat, clean condition.

3.12 FIELD QUALITY CONTROL

- A. Inspection of Forms and Reinforcing:
 1. Approval of forms and reinforcing steel must be received from Project Inspector prior to pouring concrete.
 2. Notice of readiness to place first pour shall be given to Project Inspector, DSA, Architect, and Engineer not less than 48 hours prior to placement of concrete to allow for inspection.
 3. Pouring of concrete shall not proceed prior to completing requested adjustments to forms and reinforcing and without approval of Project Inspector.
- B. Testing of Concrete:
 1. Frequency and Samples for Testing:
 - a. Four identical cylinder samples for strength tests of each class of concrete placed each day shall be taken not less than once a day, or not less than once for each 50 cubic yards of concrete, or not less than once for each 2,000 square feet of surface area for slabs or walls.
 - b. In addition, samples for strength tests for each class of concrete shall be taken for seven-day tests at the beginning of the concrete work or whenever the mix or aggregate is changed.
 2. Testing:
 - a. Slump: Each truck's concrete shall be tested for slump before concrete is placed.
 - b. Strength:

- 1) Tests for strength will be conducted by Testing Agency on one cylinder at 7 days and two cylinders at 28 days. The fourth remaining cylinder will be available for testing at 56 days if the 28-day cylinder test results do not meet the required design strength.
 - 2) On a given project, if the total volume of concrete is such that the frequency of specified testing would provide less than five strength tests for a given class of concrete, tests shall be made from at least five randomly selected batches or from each batch if fewer than five batches are used.
- C. Slip-Resistance Testing: Owner's Testing Agency will perform testing on flatwork to verify compliance with specified slip-resistance.
1. The coefficient of friction will be measured by California Test 342 before pavement is opened to public traffic, but not sooner than 7 days after concrete placement
 2. Where paving is determined to have a coefficient of friction less than 0.30, Contractor is to repair and/or replace these surfaces at no cost to Owner.

3.13 CLEANING

- A. Upon completion of work of this Section promptly remove from the working area all scraps, debris and surplus material of this Section.
- B. Clean excess material from surface of all concrete walks and utility structures.
- C. Power wash concrete surfaces to remove stains, dried mud, tire marks, and rust spots.
- D. Comply with any additional requirements of additive manufacturer for colored concrete.

3.14 PROTECTION

- A. Graffiti-resistant Coating:
 1. Surface Preparation: Prepare concrete surface to receive graffiti-resistant coating specified in Section 09 9623, Graffiti-Resistant Coatings, where indicated.
 2. Concrete must be clean, dry, and free of efflorescence and dust.
- B. Protect work and materials of this Section prior to and during installation, and protect the installed work and materials of other trades.
- C. In the event of damage during construction, make all repairs and replacements necessary to the approval of the Architect, at no additional cost to the Owner.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Chain link fences
 - 2. Gates and gate hardware.

1.2 RELATED REQUIREMENTS

- A. Section 01 6116, Volatile Organic Compound (VOC) Restrictions, for VOC limits pertaining to adhesives, sealants, fillers, primers, and coatings.
- B. Section 01 8113, Sustainable Design Requirements, for CAL-Green general requirements and procedures.
- C. Section 32 1600, Site Concrete.
- D. Section 08 7100, Door Hardware, for padlocks.

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CAL Green), edition as noted on the drawings, as adopted by the California Division of the State Architect (DSA).
- C. Chain Link Fence Manufacturers' Institute (CLFMI):
 - 1. Products Manual.
- D. ASTM International (ASTM):
 - 1. A153: Zinc Coating (Hot Dip) on Iron and Steel Products.
 - 2. A392: Zinc Coated Steel Chain Link Fence Fabric.
 - 3. A653/A653M: Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
 - 4. A780/A 780M: Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings.
 - 5. C33/C33M: Standard Specification for Concrete Aggregates.
 - 6. C94: Ready-mixed Concrete.
 - 7. C150/C150M: Standard Specification for Portland Cement.
 - 8. F668: Poly Vinyl Chloride (PVC) Coated Steel Chain Link Fence Fabric.
 - 9. F934: Standard Colors for Poly Vinyl Chloride (PVC) Coated Chain Link.
 - 10. F969: Standard Practice for Construction of Chain-Link Tennis Court Fence.

CHAIN LINK FENCES AND GATES
SECTION 32 3113
3595001

11. F1083: Pipe, Steel, Hot-Dipped Zinc Coated (Galvanized) Welded, for Fence Structures.

1.4 ADMINISTRATIVE REQUIREMENTS

A. Submittal Procedures:

1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
3. Sustainable Design Submittals shall comply with the additional requirement of Section 01 8113, Sustainable Design Requirements.

1.5 ACTION SUBMITTALS

- A. Shop Drawings: Submit showing all parts, connections and anchorages, adjacent materials, fully dimensioned and noted. Indicate plan layout, spacing of components, post foundation dimensions, hardware anchorage and schedule of components.
- B. Products Data: Submit list and complete descriptive data of all products proposed for use. Include manufacturer's specifications, published warranty or guarantee, installation instructions, and maintenance instructions.
- C. Samples:
 1. Chain-link fabric, approximately 12 inches square, in selected color.
 2. Hardware and fittings if requested by Architect.

1.6 INFORMATIONAL SUBMITTALS

- A. Sample of manufacturer's warranty.
- B. Sustainable Design:
 1. General:
 - a. Submit information necessary to establish and document compliance with the California Green Building Standards Code.
 - b. Sustainable design submittals are in addition to other submittals.
 2. The following information shall be provided:
 - a. Paints and Coatings: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.

1.7 CLOSEOUT SUBMITTALS

- A. Warranty/Guarantee: Submit executed warranty and Subcontractor's guarantee.

1.8 QUALITY ASSURANCE

- A. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.
- B. Use materials and products of one manufacturer whenever possible.
- C. All materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.

1.9 DELIVERY, STORAGE AND HANDLING

- A. Deliver undamaged products to job in manufacturer's sealed containers and/or original bundles with tags and labels intact.
- B. Store materials in protected, dry conditions off of ground and in areas so as to not interfere with the progress of the work.
- C. Transport, store and handle in strict accord with the manufacturer's written recommendations.

1.10 FIELD CONDITIONS

- A. Make and be responsible for all field dimensions necessary for proper fitting and completion of work. Report discrepancies to Architect before proceeding.

1.11 WARRANTY

- A. Manufacturer: In addition to the Contractor's and Subcontractor's Guarantee, furnish Owner with manufacturer's fully executed written warranty for chain link fencing against defects in materials and workmanship, including the following:
 - 1. Windscreen: 3 years.

PART 2 - PRODUCTS

2.1 DESIGN AND PERFORMANCE CRITERIA

- A. Industry Standards: Materials and installation shall conform to the requirements of the Chain Link Fence Manufacturers Institute (CLFMI) "Product Manual."
- B. Regulatory Requirements: Pedestrian gates and related hardware shall comply with applicable codes, including provisions for accessibility required by CBC and the Americans with Disabilities Act "Designs for Accessible Design." Comply with the most stringent.
- C. Use new components **[,except existing fence indicated to be relocated,]** free from defects affecting service and appearance.
- D. Sizes specified or shown are minimum.

CHAIN LINK FENCES AND GATES

SECTION 32 3113

3595001

- E. Provide ferrous material except as otherwise indicated or specified.
- F. Sustainable Design:
 - 1. VOC emissions for field-applied paints and coatings must comply with limits specified in Section 01 6116.

2.2 WORKMANSHIP

- A. Galvanizing: Hot dip galvanize ferrous materials after fabrication. Repair zinc coating damaged in shop or during field erection by re-coating with hot repair compound, Re Galv, Galvalloy, Galveweld-alloy, or equal, applied in accord with manufacturer's recommendations.

2.3 MATERIALS

- A. Vinyl Coated Chain Link Fabric: Steel wire with no less than 1.20 ounce of zinc coating per square foot of surface area, covered with color coating of polyvinyl chloride no less than 15 mils thick fusion method with breaking strength of 1200 pounds (Class 2b), and complying with ASTM F668.
 - 1. Typical:
 - a. Wire Diameter: 9 gage, coated size.
 - b. Mesh Opening: 2 inches.
 - 2. Edges: Knuckle fabric at bottom and at top selvage.
 - 3. Fabric widths shall be one piece.
 - 4. Color of PVC Coating: In compliance with ASTM F934, black.
- B. Security Fabric: 16 gauge galvanized sheet metal in conformance with ASTM A653/A653M, 1.3 pounds per square foot, with round hole perforations; McNichols item number 1431141638 as specified and the basis of design, or equal.
 - 1. Perforations shall be 3/16" holes on a 1/4" stagger.
 - 2. Open Area: 51 percent.
 - 3. Finish: Prime and paint as specified in Section 09 9100, Painting, prior to installation.
- C. Security Fabric U-Edging: 14 gauge. galvanized hot rolled U shaped edging, 1 inch tall face x 3/8 inch opening width; McNichols quality U-Edging, item number 4003801410 as specified and the basis of design, or equal.
- D. Round Steel Pipe Fence Framework:
 - 1. Round steel pipe and rail, Schedule 40 standard weight pipe, in accordance with ASTM F1083, 1.8 oz/sq. ft (550 g/sq. m) hot dip galvanized zinc exterior and 1.8 oz/sq. ft (550 g/sq. m) hot dip galvanized zinc interior coating.
 - a. Regular Grade: Minimum steel yield strength 30,000 psi (205 MPa)
 - b. High Strength Grade: Minimum yield strength 50,000 psi (344 MPa)

- E. Line Posts:
 - 1. Without Slats or Windscreen: Regular Grade.
 - a. To 8'-0" High Maximum: 2-3/8 inch outside diameter pipe at 3.65 pounds per linear foot.
- F. End, Corner and Pull Posts: End, corner and pull posts shall also comply with gate post requirements, where occurs.
 - 1. Without Slats or Windscreen: Regular Strength.
 - a. To 8'-0" High Maximum: 2-7/8 inch outside diameter pipe at 5.79 pounds per linear foot.
- G. Gate Posts, Single Leaf: Gate posts shall also comply with End, Corner and Pull Post requirements.
 - 1. To 6 Feet Wide: 2-7/8 inch outside diameter pipe at 5.79 pounds per linear foot.
- H. Post caps: Cast or malleable iron ball or acorn shape; with opening for top rail.
- I. Top Rail, Bottom Rails, and Braces: 1-5/8" outside diameter pipe at 2.27 pounds per linear foot., or 1-5/8 inch x 1-1/4 inch roll formed section, 14 gauge.
 - 1. Brace Assembly:
 - a. Equally spaced between top rail and bottom fabric selvage and run from end, gate, or corner post to first line posts with suitable malleable iron fittings.
 - b. Truss from line post to end, gate, or corner post with 3/8 inch round rod.
- J. Coating for Fencing Components, Including Posts: Polyester powder coating, 3 to 4 mils thick, applied by the electrostatic spray process and baked at 450-500 degrees until cured; with 55 to 70 gloss.
 - 1. Color: Black.
- K. Bands: 14 gauge x 1 inch wide steel spaced 15 inches on center. for securing stretcher bars to end and gate posts.
 - 1. Bands may be used in conjunction with special fitting for securing rails to end and gate posts.
 - 2. Chamfer to ease projecting edges of bands.

2.4 GATES

- A. Frames:
 - 1. Gate Leaves to 6 Feet Wide: 1-5/8 inch outside diameter pipe at 2.27 pounds per linear foot.
 - 2. Gate Leaves Over 6 Feet Wide: 2 inch outside diameter pipe at 2.72 pounds per linear foot.

CHAIN LINK FENCES AND GATES

SECTION 32 3113

3595001

3. Provide additional horizontal and vertical pipe or tube as necessary to assure proper gate operation and attachment of fabric and hardware.
- B. Diagonal Bracing: Provide adjustable length 3/8 inch truss rods on non-welded gate frames and welded gate frames where corner rigidity is insufficient to insure no sag.
- C. Fabric: As specified for fence.
- D. Gate Assembly:
 1. Weld or assemble gate frame with malleable or pressed steel fittings and rivets to provide rigid connections.
 2. Install fabric with stretcher bars at vertical edges, which may also be used at top and bottom edges.
 3. Securely attach stretcher bars and fabric to frame on all sides at 15 inches on center.
 4. Attach hardware with rivets or by other means which will provide security against removal.
- E. Gate Hardware:
 1. General: Hardware at disabled accessible gates shall meet accessibility, including mounting, of the ADA and CBC. Comply with the most stringent.
 2. Hinges: Malleable iron, pressed or forged steel, non-liftoff type, easy noiseless operation and long wear, offset to permit 180 degree gate opening.
 - a. Provide 1-1/2 pair hinges for each leaf over 6 feet nominal height.
 - b. Ball and socket hinges not acceptable.
 3. Fork Latch: Malleable iron, drop fork latch which permits operation of the gate from either side, with padlock eye provided as integral part of latch.
 4. Panic / Lever Hardware: At gates to receive panic hardware or lever locksets, provide galvanized iron lockset boxes, backing plates or mounting plates as required for permanent, vandal resistant mounting.
 5. Kick Plates: 10 inches tall x width of gate x 14 gauge minimum, smooth uninterrupted surfaced, galvanized steel.
 - a. Mount on the bottom edge of gate at the push side. Mount on both sides at two-way swing gates.
 - b. Bottom edge of plate shall be not more than 3 inches above the top of the walk.
 - c. Plate shall be welded to the fence frame and shall allow the gate to be opened by a wheelchair footrest without creating a trap or hazardous condition.
 - d. Provide at pedestrian gates that are within the disabled accessible path of travel
 6. Gate Stop and Holder: Malleable iron.
 - a. Stop shall automatically engages gate frame and holds it in open position.
 - b. Provide at vehicle gates.

7. Double Gates: Provide cane bolt and ground set keeper with locking device and padlock eyes designed as integral part of latch, requiring one padlock for locking both leaves.

2.5 ADDITIONAL MATERIALS AND COMPONENTS

- A. Galvanizing Repair: Zinc coating damaged in shop or during field erection shall be by re-coated using a hot repair compound; "Regalv" repair stick by Rotometals, San Leandro, CA, or equal, applied in accordance with manufacturer's recommendations.
- B. Concrete:
 1. Materials:
 - a. Portland cement, ASTM C 150.
 - b. Aggregate: ASTM C33.
 - c. Water: Potable and free from substances harmful to concrete.
 2. Mix materials to obtain low slump concrete with 28 day compressive strength of 2,500 psi.
 - a. Maximum Size Aggregate: 1-1/2 inch.
 - b. Re-tempering not permitted.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. General:
 1. Execute work in accord with best trade practice for industrial fence installations.
 2. Make welds neat and secure, grind off excess exposed metal.
 3. Securely set posts plumb in alignment at proper depth and height, and rigid bracing where needed; install fabric under tension and securely tie to posts, rails and braces.
 4. Gates shall move freely without sag.
- B. Setting Posts:
 1. General: Space posts as indicated but not more than 10 feet on center.
 2. Pour and tamp concrete leaving no voids.
 - a. Check posts for vertical and top alignment and hold in position.
 - b. Dome top of concrete and trowel smooth to shed water away from post.
 - c. Align posts in footings as follows:
 3. Without Slats or Windscreen: Footings for End, corner and pull posts shall also comply with gate post requirements, where occurs.
 - a. Line Posts to 8'-0" High Maximum: 1'-0" diameter, 3'-3" minimum embedment.

CHAIN LINK FENCES AND GATES

SECTION 32 3113

3595001

- b. End, Corner and Pull Posts to 8'-0" High Maximum: 1'-0" diameter, 4'-3" minimum embedment.
- 4. Single Leaf Gates: Footings for gate posts shall also comply with End, Corner and Pull Post requirements.
 - a. To 6 Feet Wide: 12 inch diameter, 36 inch embedment.
- C. Where posts occur adjacent to structures or other work where concrete foundations may conflict with post footing, block out to allow post installation or use off-set post. Hold post 4 inches clear from face of structure.
- D. Fabric: Leave about 1-1/2 inches between ground and bottom barbs.
 - 1. Pull fabric taut and tie to posts, rails **[and tension wires]**.
 - 2. Install fabric on security side of fence.
 - 3. Fabric shall remain under tension after pulling force is released.
- E. Gates:
 - 1. Install gates plumb, level and secure, with full swing or slide without interference.
 - 2. Install ground set items in substantial concrete mass for adequate anchorage.
- F. Tie Wires:
 - 1. Install with one tight turn to hold fabric firmly to frame.
 - 2. Bend ends of wire inward to prevent hazard to persons or apparel.
- G. Fasteners:
 - 1. Install nuts for tension band and hardware bolts on side of fence opposite fabric side.
 - 2. Spoil ends of bolts to prevent removal of nuts.

3.2 ADJUSTING

- A. Repair exposed zinc coatings damaged in shop or during field erection using specified repair system and in compliance with ASTM A 780,
- B. Adjust gated hardware for smooth operation and lubricate where necessary.

END OF SECTION

*p:\sacramento\3595 tracy unified school district\001-000_villalovoz es new shade structures\08 specifications\06 spec\04 final\jacobson\32 3113_chain link fences and gates.docx
Last Updated: February 25, 2022*

PART 1 - GENERAL

1.1 SUMMARY

A. Scope of Work:

1. Furnish all labor, materials, tools, equipment, and transportation required to perform and complete the installation of an automatic sprinkler irrigation system, including all piping, sprinkler heads, controls, connections, testing, etc. as shown on the Drawings and as specified herein. The water source for this project is potable water.
2. Utilize and accept as standards manufacturer's recommendations and/or installation details for any information not specifically detailed on the Drawings.

1.2 RELATED REQUIREMENTS

- A. Section 01 6116, Volatile Organic Compound (VOC) Restrictions, for VOC limits pertaining to adhesives, sealants, fillers, primers, and coatings.
- B. Section 01 8113, Sustainable Design Requirements, for CAL-Green general requirements and procedures.
- C. Section 31 0000, Earthwork.
- D. Section 31 2333, Trenching and Backfilling.
- E. Section 32 9000, Landscaping.

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CALGreen), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).

1.4 ADMINISTRATIVE REQUIREMENTS

A. Submittal Procedures:

1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
3. Sustainable Design Submittals shall comply with the additional requirements of Section 01 8113, Sustainable Design Requirements

**IRRIGATION
SECTION 32 8000
3595001**

B. Pre-Installation Meeting:

1. Request and hold a pre-installation meeting prior to beginning the work of this Section. Parties required to be in attendance are the Landscape Contractor, Project Inspector, Owner's Representative, and the Landscape Architect.

1.5 ACTION SUBMITTALS

- A. Product names are used as standards; provide proof as to equality of any proposed material and do not use other materials or methods unless approved in writing by the Owner's Representative. Submit no more than one request for substitution for each item. The decision of the Owner's Representative is final.
- B. Use equipment capacities specified herein as the minimum acceptable standards.
- C. List materials in the order in which they appear in Specifications; include substitutions. Submit the list for approval by the Owner's Representative.
- D. Make any mechanical, electrical, or other changes required for installation of any approved, substituted equipment to satisfaction of Owner's Representative and without additional cost to Owner. Approval by Owner's Representative of substituted equipment and/or dimensional drawing does not waive these requirements.
- E. Do not construe approval of material as authorization for any deviations from Specifications unless attention of Owner's Representative has been directed to specified deviations.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data for the following:
 1. For landscape contractor.
- B. Sample of manufacturers' warranty.
- C. Record of Pre-Installation Meeting.
- D. Sustainable Design:
 1. General:
 - a. Submit information necessary to establish and document compliance with the California Green Building Standards Code.
 - b. Sustainable design submittals are in addition to other submittals.
 2. The following information shall be provided:
 - a. Adhesives and Sealants: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.
 - b. Paints and Coatings: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.

1.7 CLOSEOUT SUBMITTALS

- A. Warranty/Guarantee: Submit executed warranty and subcontractor's guarantee.
- B. Maintenance and Operating Instructions:
 - 1. Furnish operating maintenance instructions bound in a hardback binder and indexed. Start compiling data upon approval of list of materials. Do not request final inspection until booklets are approved by Owner's Representative.
 - 2. Incorporate the following information in these sets:
 - a. Complete operating instructions for each item of irrigation equipment.
 - b. Typewritten maintenance instructions for each item of irrigation equipment.
 - c. Manufacturer's bulletins which explain installation, service, replacement parts, and maintenance.
 - d. Service telephone numbers and/or addresses posted in an appropriate place as designated by Owner's Representative.
- C. Record Drawings.

1.8 QUALITY ASSURANCE

- A. Qualifications: Work must be complete by a licensed Landscape Contractor. Provide proof of five years' continuous experience in landscaping and irrigation of projects of similar size.
- B. Certification: Ensure that the contractor installing the Central Control System is trained and certified in the installation of the Central Control System. The training and certification must have been completed within two years prior to the installation date.
- C. Work Force: Ensure that an experienced foreman is present at all times during installation. Keep the same foreman and workers on the job from commencement to completion.
- D. Reviews: Specifically request reviews of all items listed in Article INSPECTION REQUIREMENTS, prior to progressing to the next level of work.
- E. Standards:
 - 1. Provide work and material in full accordance with the rules and regulations of the National Electric Code; the Uniform Plumbing Code; and other applicable state or local laws or regulations.
 - 2. Furnish, without extra charge, additional material and labor required to comply with these rules and regulations, though the work may not be specifically indicated in the Specifications or Drawings.
 - 3. Where the Specification requirements exceed those of the above-mentioned codes and regulations, comply with the requirements in the Specifications.

**IRRIGATION
SECTION 32 8000
3595001**

1.9 DELIVERY, STORAGE AND HANDLING

- A. Transport, store and handle in strict conformance with the manufacturer's written recommendations.
- B. Deliver undamaged products to job in manufacturer's sealed containers and/or original bundles, with tags and labels intact. All material containers or certificates shall be clearly marked by manufacturer as to contents for inspection.
- C. Store materials in original undamaged packages and containers, inside well-ventilated area protected from weather, moisture, soilage, extreme temperatures, and humidity. Lay flat, blocked off ground.
- D. Use all means necessary to protect irrigation system materials before, during, and after installation and to protect related work and material.
- E. Handle plastic pipe carefully, especially protecting it from prolonged exposure to sunlight. Store pipe on beds that are the full length of the pipe, and keep pipe flat.

1.10 FIELD CONDITIONS

- A. Information on Drawings relative to existing conditions is approximate. During progress of construction, make deviations necessary to conform to actual conditions, as approved by Owner's Representative, without additional cost to Owner. Accept responsibility for any damage caused to existing services. Promptly notify Owner's Representative if services are found which are not shown on Drawings.
- B. Protect existing trees-to-remain as specified in "Existing Tree Protection" in Article PREPARATION, in Part 3 of this Section.
- C. Protect existing utilities within construction area. Repair damages to utility lines that occur as a result of operations of this work.
- D. Verify dimensions at building site and check existing conditions before beginning work. Make changes necessary to install work in harmony with other crafts after receiving approval by Owner's Representative.

1.11 INSPECTION REQUIREMENTS

- A. Obtain verification from Project Inspector for the following at the appropriate times during construction and prior to further progression of work in this Section:
 - 1. Pressure testing of all mainlines and lateral lines (See "Hydrostatic Tests – Open Trench" in Article FIELD QUALITY CONTROL, in Part 3 of this Section),
 - 2. Trench depth,
 - 3. Sleeves under pavement,
 - 4. Flushing of all mainlines and lateral lines,
 - 5. Backfill and pipe bedding,

6. Layout of heads,
 7. Operation of system and coverage adjustments (with Landscape Architect) after system is fully automated and operational, backfill of trenching is completed, and surface has been restored to original grades.
- B. In case of failure to obtain any verification by the Project Inspector as required above, remove and replace work as necessary to obtain the verification at no additional cost to the Owner.

1.12 WARRANTY AND GUARANTEE

- A. Manufacturer: In addition to the Contractor's and Subcontractor's Guarantee, furnish Owner with manufacturer's available fully executed written warranty against defects in materials and workmanship.
- B. Subcontractor Guarantee: Shall include damage by leaks and settlement of irrigation trenches.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Use materials as specified; any deviation from the Specifications must first be approved by the Owner's Representative in writing.

2.2 DESIGN AND PERFORMANCE CRITERIA

- A. Sustainable Design:
1. VOC emissions for field-applied adhesives, sealants, and sealant primers must comply with limits specified in Section 01 6116.
 2. VOC emissions for field-applied paints and coatings must comply with limits specified in Section 01 6116.

2.3 MATERIALS

- A. Automatic Control Valves: As indicated on Drawings.
- B. Gate Valve: As indicated on Drawings.
- C. Pipe and Fittings:
1. PVC pipe: As indicated on Drawings.
 2. PVC fittings three-inch (3") size and smaller: High impact, standard weight, Schedule 40, molded PVC as manufactured by George Fischer, Lasco, Spears, or approved equal.

IRRIGATION
SECTION 32 8000
3595001

3. PVC fittings four-inch (4") size and larger: High impact, standard weight, Class 200 gasketed, molded PVC as manufactured by George Fischer, Lasco, Spears, or approved equal.
 4. All plastic pipe and fittings: Continuously and permanently marked with manufacturer's name, type of material, IPS size, schedule, NSF approval, and code number.
 5. Threaded PVC pipe and nipples: IPS Schedule 80 when necessary to use threaded connections to gauges, valves, or control valves. Threaded adapters may be used in place of nipples when making pipe to valve connections.
 6. Use 45-degree fittings for changes in depth of pipe, and at transition from main line to automatic control valves.
 7. Piping above ground: Schedule 40 galvanized steel with cast-iron fittings.
- D. PVC Primer: Weld-On P-70 Purple Primer or approved equal.
- E. PVC Glue: Weld-On 711 Gray heavy bodied PVC Cement or approved equal.
- F. Sprinkler Heads: As indicated on Drawings.
- G. Quick Coupler Valves: As indicated on Drawings.
- H. Sleeves: As indicated on Drawings.
- I. All Valve Boxes and Covers: Manufactured, green with "Irrigation – Non-Potable" permanently embossed on cover. Carson, Rainbird or approved equal.
- J. Reduced Pressure Backflow Preventer: As indicated on Drawings.
- K. Automatic Sprinkler Control Wire:
1. Connections between remote control valves and controller: UF-14 direct burial polyethylene (PE) insulated wire, Paige Electric P7079D or approved equal. Common wire to be white, and lead wire to be colored. If multiple controllers are used, a different color is to be used for each controller's lead wire. (Use red for the first controller). Spare wires are to be yellow.
 2. UL Listed waterproof sealing pack for wire connections: 3M DBR/Y-6, or approved equal.
 3. Provide adequate working space around electrical equipment in compliance with local codes and ordinances.
 4. Electrical, other than low voltage, such as power wiring, conduit, fuses, thermal overloads and disconnect switches, is included under Division 26 of these Specifications.
- L. Unions And Flanges:
1. Steel unions and flanges two inches (2") and smaller: 150 lb. screwed black (brass to iron seat) or galvanized malleable iron (ground joint).

2. Steel unions and flanges two and one-half inches (2 ½") and larger: 150 lb. black flange union, flat-faced, full gasket.
 3. Gaskets: One-sixteenth inch (1/16") thick rubber Garlock No. 122, Johns-Manville or approved equal.
 4. Flange Bolts: Open-hearth bolt steel, square heads with cold pressed hexagonal nuts, cadmium plated in ground. Provide copper-plated steel bolts and nuts or brass bolts and nuts for brass flanges.
- M. Sand for Trench Backfill: Natural sand, free of roots, bark, sticks, rags, or other extraneous material

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Prior to commencement of the work of this Section, obtain written verification from the project Civil Engineer that the rough grade in landscape areas is in conformance with Section 31 0000 - Earthwork.
- B. Examine conditions of work in place before beginning work; report defects.

3.2 PREPARATION

- A. Scheduling: Notify the Project Inspector prior to commencing and/or continuing the work of this Section. Remove and replace, at no cost to Owner, any work required as a result of failure to give the appropriate notification.
- B. Measurements: Take field measurements; report variance between plan and field dimensions.
- C. Protection: Maintain warning signs, shoring and barricades as required. Prevent injury to, or defacement of, existing improvements. At no additional cost to Owner, repair or replace items damaged by installation operations.
- D. Existing Tree Protection:
 1. Avoid unnecessary root disturbance, compaction of soils within drip line, or limb breakage.
 2. Do not store material or dispose of any material other than clean water within the drip line.
 3. Provide adequate irrigation during construction.
 4. Replace any tree damaged during construction with a tree of equal size and value at no additional cost to Owner.
 5. Adjust trench locations in field to minimize damage to existing elements and plant roots of trees-to-remain at no additional cost to Owner.

IRRIGATION
SECTION 32 8000
3595001

- E. Surface Preparation: Prior to beginning sprinkler irrigation work, complete placement of topsoil as specified in Section 31 0000 – Earthwork. Notify Project Inspector of irregularities if any.

3.3 AUTOMATIC CONTROLLER

- A. Connect automatic control valves to controller(s) in sequence as shown on Drawings.
- B. Install all exposed wires to a minimum of twenty-four inches (24") beyond controller within a UL approved rigid conduit.

3.4 GRADING

- A. Install all irrigation features to their finished grade and at depths indicated. Complete and /or accommodate all rough grading and/or finish grading before commencing with trenching.

3.5 LAYOUT

- A. Lay out work as accurately as possible to Drawings. Drawings are generally diagrammatic to extent that swing joint offsets and fittings are not shown. Record all changes on the Record Drawings.
- B. Do not willfully install the irrigation system as shown on Drawings when it is obvious, in the field, that obstructions or other discrepancies exist which may not have been considered in the design. Notify Owner's Representative of discrepancies before proceeding.

3.6 EXCAVATING AND TRENCHING

- A. General: Perform excavations as required for installation of work included under this Section, including shoring of earth banks to prevent cave-ins. Restore surfaces, existing underground installations, etc., damaged or cut as result of this work to their original condition and in a manner approved by the Landscape Architect.
- B. Width:
 - 1. Make trenches wide enough to allow a minimum of six inches (6") between parallel pipelines and three inches (3") between side of pipe and side of trench. Do not allow stacking of pipe within trench.
 - 2. Allow a minimum clearance of twelve inches (12") in any direction from parallel pipes of other trades.
- C. Preparation of Excavations: Remove rubbish and rocks from trenches. Bed pipe on a minimum of three inches (3") of clean, rock-free soil to provide a firm, uniform bearing for entire length of pipeline. If clean, rock-free soil is not available, use sand for pipe bedding. See Backfill and Compacting for the remainder of the trench backfill.

- D. Minimum depth of cover: Unless shown otherwise, provide the following minimums:
 - 1. Mainline: twenty-four inches (24") cover.
 - 2. Lateral line: twelve inches (12") cover for spray heads, and eighteen inches (18") cover for rotor heads.
- E. Conflicts with other trades:
 - 1. Hand-excavate trenches where potential conflict with other underground utilities exist.
 - 2. Where other utilities interfere with irrigation trenching and piping work, adjust the trench depth as instructed by Owner's Representative.

3.7 BACKFILL AND COMPACTING

- A. General: Do not begin until hydrostatic tests are completed and when system is operating and after required tests and inspections have been made.
- B. Backfill directly around the pipe: Cover pipe with a minimum of three inches (3") of clean, rock-free soil. If clean, rock-free soil is not available, use sand for three inches (3") of backfill above the pipe. The remainder of the trench backfill material can be native soil or material described below. Do not allow wedging or blocking of pipe.
- C. For backfill of trenches under paving areas:
 - 1. See Section 31 0000 – Earthwork for compaction rates and material
 - 2. See Section 31 2333 – Trenching and Backfilling for trench backfill procedure.
- D. For backfill of trenches in landscape areas:
 - 1. Place backfill in six-inch (6") layers and compact with an acceptable mechanical compactor.
 - 2. Compact backfill material in landscape areas to eighty-five percent (85%) maximum dry density of the soil.
 - 3. If settlement occurs along trenches, make adjustments in pipes, valves, and sprinkler heads, soil, sod or paving as necessary to bring the system, soil, sod or paving to the proper level or the permanent grade, without additional cost to the Owner.
- E. Excess Soil: Remove all rocks, debris, and excess soil that results from sprinkler irrigation trenching operations, landscape planting, and soil preparation operations off site at no additional cost to the Owner. If soil meets topsoil requirements in Section 31 0000 – Earthwork, it may be used for finish grading.
- F. Finishing: Dress-off areas to eliminate construction scars.

**IRRIGATION
SECTION 32 8000
3595001**

3.8 CONTROL WIRES

- A. General: Install control wires beneath sprinkler main line whenever possible; tape wires to mainline pipe. Provide one spare wire for each controller.
- B. Slack Wire: Provide eighteen inches (18") of slack wire for each wire connected to automatic control valve. Slack wire shall be coiled and left in the valve box. Tape wires in bundles every ten feet (10'); do not tape wires in sleeves.
- C. Expansion and Contraction: Snake wire in trench to allow for contraction of wire.
- D. Wire Passing Under Existing or Future Paving or Construction: Encase in PVC Schedule 40 or galvanized steel conduit extending at least twelve inches (12") beyond edges of paving or construction.
- E. Wire Connections: Install wire connections in a waterproof sealing pack.
- F. Wire Splicing: Permit splicing only on runs exceeding 500 feet. Locate all splices within valve boxes.
- G. Wire Termination: Install wire in a valve box with eighteen inches (18") of slack wire coiled and individually capped with approved waterproof sealing pack.
- H. Spare Wire: Install two (2) spare wires along each wire path. If there is more than one wire path from the controller, the contractor to install two (2) spare wires per path. Provide eighteen inches (18") of slack wire at each automatic control valve.

3.9 FLUSHING LINES

- A. Thoroughly flush lines prior to installing valves, performing hydrostatic testing, or installing sprinklers. Divert water to prevent washouts.

3.10 AUTOMATIC CONTROL AND QUICK COUPLER VALVES

- A. Install where shown and where practical; place no closer than twelve inches (12") to walk edges, building walls, or fences. Refer to detail for example.
- B. Thoroughly flush mainline before installing valve.
- C. Install valves in ground cover areas where possible.

3.11 PIPING

- A. General: Install in conformance with reference standards, manufacturer's written directions, as shown on Drawings and as herein specified.
- B. Workmanship:
 - 1. General: Install sprinkler irrigation equipment in planted areas throughout the site.
 - 2. Coordination: Organize location of sleeves with other trades as required.

C. Pipe Line Assembly:

1. General:
 - a. Cutting: Cut pipe square; remove rough edges or burrs.
 - b. Solvent-welded Connections: Use materials and methods recommended by the pipe manufacturer.
 - c. Brushes: Use non-synthetic brushes to apply solvents and primer.
 - d. Cleaning: Clean pipe and fittings of dirt, moisture, and debris prior to applying solvent or primer.
 - e. Assembly: Allow pipe to be assembled and welded on the surface or in the trench.
 - f. Expansion and Contraction: Snake pipe from side to side of trench to allow for expansion and contraction.
 - g. Location: Locate pipes as shown on Drawings except where existing supply valves, utilities or obstructions prohibit or where slight changes are approved to better suit field conditions.
2. Flexible Elastometric Seal Joints:
 - a. General: Assemble in strict conformance with the pipe manufacturer's instruction.
 - b. Rubber Rings: Use rubber rings specific for water service systems.
 - c. Cleaning: Thoroughly clean ring and groove of dirt, moisture and debris using a clean, dry cloth. Do not use solvents, lubricants, cleaning fluids or other material for cleaning.
 - d. Seating: Properly seat ring in groove.
 - e. Spigot:
 - 1) General: Clean spigot-end of pipe as in "Cleaning" above prior to applying lubricant recommended by pipe manufacturer.
 - 2) Seating: Insert spigot into bell and seat to full depth required.
3. Connections:
 - a. Threaded Plastic Pipe Connection:
 - 1) Use Teflon tape or pipe joint compound.
 - 2) When assembling to threaded pipe, take up joint no more than one full turn beyond hand-tight.
 - b. Metal Valves and Plastic Pipe: Use threaded plastic male adapters.
 - c. Metal to Metal Connections:
 - 1) Use specific joint compound or gasket material for type of joint made. Where pipe of dissimilar metals are connected, use dielectric fittings.
 - 2) Where assembling, do not allow more than three full threads to show when joint is made up.
 - d. Where assembling soft metal (brass or copper) or plastic pipe, use strap-type friction wrench only; do not use a metal-jawed wrench.
 - e. Threading:

**IRRIGATION
SECTION 32 8000
3595001**

- 1) Do not permit the use of field-threading of plastic pipe or fittings. Use only factory-formed threads.
 - 2) Use factory-made nipples wherever possible. Permit the use of field-cut threads in metallic pipe only where absolutely necessary. When field-threading, cut threads accurately on axis with sharp dies.
 - 3) Use pipe joint compound for all threaded joints. Apply compound to male thread only.
4. Sleeves and conduits:
- a. Use sleeves of adequate size to accommodate retrieval for repair of wiring or piping and extend a minimum of twelve inches (12") beyond edges of walls or paving.
 - b. Provide removable, non-decaying plug at end of sleeve to prevent entrance of soil.
5. Unions: Locate unions for easy removal of equipment or valve.
6. Capping: Plug or seal opening as lines are installed to prevent entrance materials that would obstruct pipe. Leave in place until removal is necessary for completion of installation.

3.12 SPRINKLER HEADS

- A. Sprinkler heads: Locate as shown on the Drawings except where existing conditions prohibit, or slight changes are approved to achieve as good or better coverage under the same conditions. Do not allow sprinkler head spacing to exceed the maximum shown on the Drawings. Plumb heads.
- B. Handling, Assembly of Pipe, Fittings, and Accessories: Allow only skilled tradesmen to handle and assemble pipe, fittings and equipment. Keep interior of pipes, fittings and accessories clean at all times. Close ends of pipe immediately after installation; leave closure in place until removal is necessary for completion of installation. Do not permit bending of pipe.
- C. Flushing: Remove end heads and operate system at full pressure until all rust, scale, and sand is removed. Divert water to prevent ponding or damage to finished work.
- D. Coverage: Accept responsibility for full and complete coverage of irrigated areas to satisfaction of Landscape Architect and make necessary adjustments to better suit field conditions at no additional costs to Owner.

3.13 FIELD QUALITY CONTROL

- A. Visual Inspection: Verify that all pipe is homogenous throughout and free from visual cracks, holes, or foreign materials. Inspect each length of pipe. All materials are subject to impact test at the discretion of the Landscape Architect.

B. Hydrostatic Tests – Open Trench:

1. Center-load piping with a small amount of backfill to prevent arching or slipping under pressure.
2. Request the presence of the Project Inspector in writing at least forty-eight hours in advance of testing.
3. At no additional cost to Owner, test in the presence of the Project Inspector.
4. Apply continuous static water pressure of 100 psi when welded plastic joints have cured at least twenty-four hours, and with the risers capped, as follows: test main lines and submains for four hours; test lateral lines for two hours.
5. Repair leaks resulting from tests; and repeat tests.
6. Test to determine that all sprinkler heads function according to manufacturer's data and give full coverage according to intent of Drawings. Replace any sprinklers not functioning as specified with ones that do, or otherwise correct system to provide satisfactory performance.

C. Continuity Testing: Test locating device and control wires for continuity prior to and after back-filling operations.

3.14 CLEAN-UP

- A. Remove debris resulting from work of this Section.**

3.15 ADJUSTMENTS AND MAINTENANCE

- A. Adjusting System:** Prior to acceptance, satisfactorily adjust and regulate entire system. Set watering schedule on controller appropriate to types of plants and season of year. Adjust remote control valves to operate sprinkler heads at optimum performance based on pressure and simultaneous demands through supply lines.
- B. System Layout:** Provide reduced prints of Record Document irrigation plans, laminated in four (4) mil. plastic, of size to fit controller door. Enlarge remote-control valve designations as necessary for legibility. Color-code areas covered by each station. Affix plans to inside of controller door.
- C. Instructions:** Upon completion of work, instruct maintenance personnel on operation and maintenance procedures for entire system.
- D. Flow Charts:** Record and prepare an accurate flow-rate chart for each automatic control valve.

3.16 RECORD DRAWINGS

- A. As specified in Section 01 3300, Submittal Procedures, and the following:**
1. Regularly update plans of the system and any changes made to the system throughout the project. Record all changes on this plan before trenches are back-filled.

IRRIGATION
SECTION 32 8000
3595001

2. Record complete as-built information and submit the Record Drawings to the Architect before applying for payment for work installed.
3. Show the following on the Record Drawings accurately to scale and dimensioned from two permanent points of reference:
 - a. and spares Distance of mainline from nearby hardscape.
 - b. Location of automatic control valves, quick couplers, and gate valves.
 - c. Location and size of all sleeves.
 - d. Location of automatic control wires.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Soil Preparation and Fertilization
 - 2. Planting
 - 3. Sodding
 - 4. Weed Control
 - 5. Mulch
 - 6. Clean-up
 - 7. Landscape Maintenance Period
- B. Work not included in this Section: Landscape elements such as concrete walks, fencing, outdoor lighting, rough grading, and clearing are not a part of this Section unless shown on the landscape Drawings.

1.2 RELATED REQUIREMENTS

- A. Section 01 8113, Sustainable Design Requirements, for CAL-Green general requirements and procedures
- B. Section 31 0000, Earthwork.
- C. Section 32 8000, Irrigation

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CALGreen), edition as noted on the drawings, as adopted by the California Division of the State Architect (DSA).
- C. EPA - Federal Insecticide, Fungicide and Rodenticide Act.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Submittal Procedures:
 - 1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.

LANDSCAPING
SECTION 32 9000
3595001

2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
- B. Pre-Installation Meeting: Request and hold a pre-installation meeting prior to beginning the work of this Section. Parties required to be in attendance are the Landscape Contractor, Project Inspector, Owner's Representative, and Landscape Architect.
- C. Pre-scheduled On-site Project Meetings: Hold regularly-scheduled (monthly or bimonthly as determined by the Landscape Architect) on-site project meetings with the Landscape Architect, Project Inspector and Owner's Representative. Dates and times will be jointly agreed upon.

1.5 ACTION SUBMITTALS

- A. Plant Material: Within fifteen (15) days after award of contract, locate plant materials required for construction. Ensure that trees and shrubs are contract- grown from a certified nursery. Notify Owner's Representative of plant material "tied off" for review at selected nursery. If specified material is not obtainable, submit the following to Owner's Representative: proof of non-availability, proposal for use of equivalent material, photographs of alternative choices of plant material. Include clear, written description of type, size, condition, and general character of plant material.
- B. Data Sheets:
 1. Provide product data for each type of landscape material indicated in the Drawings and Specifications.
 2. Letter from the manufacturer stating that the soil amendment material submitted for use on this project has no metal fragments or foreign objects.
- C. Samples: Submit samples of the following materials to Landscape Architect for approval:
 1. Soil amendment: (3) one-quart zip-locked plastic bags.
 2. Bark Mulch: (3) one-quart zip-locked plastic bags.
 3. Imported Topsoil: (3) one-quart zip-locked plastic bags.
- D. Provide soils analysis reports prepared by a qualified soils laboratory in accordance with the Soils Testing Requirements under "Soil Testing" in Article SOIL TESTING, in Part 3 of this section.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For landscape contractor.
- B. Prior to planting, submit copies of all trucking or packaging tags for all soil amendment, fertilizer and other additives to Landscape Architect so the quantities can be verified.
- C. Record of Pre-Installation Meeting.

1.7 CLOSEOUT SUBMITTALS

- A. Guarantee: Submit Subcontractor's guarantee.
- B. Record Drawings.

1.8 QUALITY ASSURANCE

- A. Qualifications: Work must be completed by a licensed Landscape Contractor. Provide proof of five years of continuous experience in landscaping and irrigation of projects of similar size (+/- 20% of the construction cost) and scope for education campuses. Landscape Contractor to have a minimum of two projects either completed or in construction in the last five years.
- B. Work Force: Ensure that an experienced foreman is present at all times during installation. Keep the same foreman and workers on the job from commencement to completion.
- C. Reviews: Specifically request reviews of all items listed below in Article INSPECTION REQUIREMENTS prior to progressing to the next level of work. The Owner's Representative reserves the right to inspect and reject material, both at place of growth and at site, before and/or after planting, for compliance with requirements for name, variety, size and quality.
- D. Reference Standards: Meet or exceed Federal, State and County laws requiring inspection of all plants and planting materials for plant disease and insect control.
- E. Plant Material:
 - 1. Conform to the current edition of Horticultural Standards for quality of Number 1 grade nursery stock as adopted by the American Association of Nurserymen. Conform to sizes specified on plant legend. Select plants which have a natural shape and appearance.
 - 2. Select only plants that are true to name, and tag one of each bundle or lot with the name of the plant in accordance with the standards of practice of the American Association of Nurserymen. In all cases, botanical names shall take precedence over common names.
 - 3. Tag each plant of a patented variety with the variety and identification number, where applicable, as it is delivered to the job site.
 - 4. Select only plants which have been nursery-grown in accordance with good horticultural practices and which have been grown under climatic conditions similar to those in the locality of the project for at least one year.
 - 5. Select only plants which are typical of their species or variety; have normal habits of growth; are sound, healthy, vigorous, well-branched and densely-foliated when in leaf; are free of disease, insect pests, eggs or larvae; and have a healthy and well-developed root system.

LANDSCAPING
SECTION 32 9000
3595001

6. Select only container stock that has been grown in the containers in which delivered for at least six (6) months, but not over two (2) years. Provide samples to show that there are no root-bound conditions.
7. Do not use plants that are severely pruned or headed-back to meet size requirements.
8. Do not plant container-grown plants that have cracked or broken balls of earth when taken from the container. Remove canned stock carefully from cans after containers have been cut on two sides with tin snips or other approved cutter.
9. At any time prior to final acceptance, be prepared to replace any plants that are rejected by the Owner's Representative because of physical damage to the plant.
10. Do not remove container-grown stock from containers before time of planting.
11. Stake shrubs with one-inch by one-inch by eighteen-inch (1"x1"x18") stakes in such manner that the stakes are not visible, and tie to upright position if they lean and/or are not growing in a vertical position.
12. Furnish quantities necessary to complete the work as shown on the Drawings and, if necessary, make up for any discrepancies in the quantities given in the Plant List at no additional cost to Owner.

1.9 DELIVERY, STORAGE AND HANDLING

- A. Packaged Materials: Deliver packaged materials in original, unopened containers showing weight, certified analysis, name and address of manufacturer, and indication of conformance with state and federal laws if applicable.
- B. Coordinate a time for the Landscape Architect to inspect the plants upon their delivery to the project site.
- C. Bulk Materials:
 1. Do not dump or store bulk materials near structures, utilities, walkways or pavements, or on existing turf areas or plants.
 2. Provide erosion-control measures to prevent erosion or displacement of bulk materials, discharge of soil-bearing water runoff, and airborne dust reaching adjacent properties, water conveyance systems, or walkways.
 3. Accompany each delivery of bulk fertilizers and soil amendments with appropriate certificates.

1.10 FIELD CONDITIONS

- A. Planting Season Limits: Do not plant when grounds are wet or temperature is below 25° F. Do not proceed with any soil preparation and fertilization if all planting cannot be completed within Planting Season Limit.

1.11 INSPECTION REQUIREMENTS

- A. Landscape Architect reserves the right to examine and reject plant material both at place of growth and at site, before and after planting, for compliance with requirements of name, variety, size, and quality.
- B. Obtain verification from Project Inspector for the following at the appropriate times during construction and prior to further progression of work in this Section:
 - 1. Rough grading is to tolerances specified in Section 31 0000 – Earthwork.
 - 2. The placement of landscape backfill material is as specified in this Section.
 - 3. Prior to the commencement of planting operations specified in this Section, the coverage and operation of the sprinkler irrigation system are as specified in Section 32 8000 - IRRIGATION.
 - 4. Required Test: For each load of soil amendment delivered to the site, spread at least two cubic yards (2 cy) of material onto a paved surface approximately two inches (2") deep. Pass a magnetic rake over the material in two directions. If any metal is found, test the entire load in the same manner. Perform all testing in the presence of the Project Inspector.
 - 5. Soil amendments, fertilizer, bark mulch and materials used for hydroseeding have been delivered to the site by the supplier, the invoices from the supplier indicate the project name and quantities delivered, and the Project Inspector has received copies of all such documents.
 - 6. Prior to planting, amendments and conditioners have been incorporated as per pre-planting recommendations, and planting areas have been made ready to receive planting.
- C. In case of failure to obtain any verification by the Project Inspector as required above, remove and replace work as necessary to obtain the verification at no additional cost to the Owner.

1.12 PROTECTION

- A. Provide protection for persons and property throughout progress of work. Use temporary barricades as required. Proceed with work in such manner as to minimize spread of dust and flying particles and to provide safe working conditions for personnel. Store materials and equipment where directed.
- B. Existing Construction: Execute work in an orderly and careful manner to protect paving, work of other trades, and other improvements.
- C. Existing Utilities: Provide protection for existing utilities within construction area. At no additional cost to Owner, repair any damages to utility lines that occur as a result of this work.

LANDSCAPING
SECTION 32 9000
3595001

- D. Landscaping: Protect landscape work and materials from damage due to landscape operations, operations by other contractors and trades, and trespassers. Maintain protection during installation and maintenance periods.

1.13 PLANTING SCHEDULE

- A. Install, establish, and maintain all lawn areas for a minimum of ninety (90) days prior to date of substantial completion. Coordinate schedule with other work and overall project schedule. Failure to install lawn areas by this date shall result in assessment of liquidated damages.
- B. Proceed with work in an orderly and timely manner to complete installation of landscaping within contract limits.

1.14 LANDSCAPE MAINTENANCE PERIOD REQUIREMENTS

- A. Beginning of Landscape Maintenance Period:
 - 1. General: Landscape Maintenance Period does not begin until all work is installed and either the sod has been placed or hydroseeded lawn has evenly germinated to an approximated blade height of one and one-half inches (1 ½”), as determined by Landscape Architect, in writing.
 - 2. On-site Inspection: When all work is complete, request and hold a meeting to include the Landscape Architect, Project Inspector, Architect and Owner’s Representative who must together authorize and determine the start date for the landscape maintenance period. Coordinate and give notice of the date and time of the on-site meeting to all parties at least forty-eight (48) hours in advance.
 - 3. Acceptability: In cases where the lawn has reached adequate fullness and germination in some areas but not all, and authorization has not been given to begin the maintenance period, proceed with mowing, trimming, spraying, etc., as necessary prior to the beginning of the maintenance period.
- B. Duration of Landscape Maintenance Period:
 - 1. The Landscape Maintenance Period shall continue for a minimum of ninety (90) calendar days. During this time, continuously maintain all areas involved until final acceptance of the work by the Owner’s Representative. See Landscape Maintenance Period procedure in Article LANDSCAPE MAINTENANCE, in Part 3 of this Section.

1.15 GUARANTEE

- A. The guarantee period for lawn and plant material shall be the duration of the landscape maintenance period, from commencement until final acceptance of the work of this Section.
- B. During the guarantee period, repair and/or replace plants and lawn not in satisfactory growing condition, as determined by Owner's Representative, without additional cost to Owner. Plants are to be replaced in accordance with Article LANDSCAPE MAINTENANCE in Part 3 of this Section, using plants of the same kind and size specified in plant list.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Use material in new and perfect condition as specified. Any deviations or substitutions from the Specification and Drawings must first be approved by Owner's Representative in writing prior to use.

2.2 SOIL PREPARATION MATERIALS

- A. Topsoil: Fertile; friable; natural loam surface soil; reasonably free of subsoil, clay lumps, brush, weeds and other litter; and free of roots, stumps, stones/rocks, and other extraneous or toxic matter harmful to plant growth.
- B. Soil Amendment: One-percent nitrogen-impregnated bark product with a ninety-percent (90%) bark base and zero to one-quarter inch (0-1/4") particle size, or approved equivalent. Do not spread until testing requirements have been satisfied.
- C. Fertilizer/Soil Conditioner: Gro-Power Plus or approved equal.
- D. Fertilizer for Trees and Shrubs: Seven-gram Gro-Power Planting Tablets (12-8-8 NPK) or approved equal.
- E. Vitamin B-1: "Superthrive", "Liquinox Start", "Cal-Liquid", or approved equal.

2.3 MISCELLANEOUS LANDSCAPE MATERIALS

- A. Bark Mulch: Untreated, shredded cedar.
- B. Tree-staking System: As indicated on Drawings.
- C. Pre-Emergent Weed Control: Oxadiazon, "Treeflan", "Ronstar 2G", "Surflan" (Elano Products Company), or approved equal.

**LANDSCAPING
SECTION 32 9000
3595001**

2.4 PLANT MATERIAL:

- A. Nursery Plant Stock:
 - 1. As indicated on Drawings. Do not remove container-grown stock from containers until planting time. Plants shall be true to name.
 - 2. Healthy, shapely, well-rooted, not pot-bound, free from insect pests or plant diseases and properly "hardened off" before planting. Replace plants that are not alive or are not in satisfactory growing condition, as determined by the Landscape Architect, without additional cost to Owner. The Landscape Architect may reject plants before and/or after planting.
 - 3. Labeled. Label at least one tree and one shrub of each species with a securely-attached, waterproof tag bearing legible designation of botanical and common name.
- B. Lawn Sod: Eighty percent (80%) Perennial Ryegrass and twenty percent (20%) Kentucky Bluegrass.

PART 3 - EXECUTION

3.1 SITE CONDITIONS

- A. Examine the site, verify grade elevations, and observe conditions under which work is to be performed. Do not proceed with work until unsatisfactory conditions have been corrected in a manner acceptable to the Owner's Representative.
- B. Proceed with complete landscape work as rapidly as portions of the site become available, working within seasonal limitations for each kind of landscape work required.
- C. Determine location of underground utilities and perform work in a manner which will avoid possible damage. Hand-excavate, as required, to minimize possibility of damage to underground utilities. Maintain grade stakes set by others until removal is mutually agreed upon by parties concerned.
- D. When conditions detrimental to sod or plant growth are encountered, such as rubble fill, adverse drainage condition, or other obstructions, notify the Owner's Representative before planting.

3.2 SOIL TESTING

- A. Coordinate soil testing in an expeditious and timely manner as required for on-site topsoil materials. Contract with a soil laboratory and include cost of sampling and testing in contract price. Take one (1) sample for every 5,000 square feet of landscape area up to a maximum of six (6) samples under the direction of and in the presence of the Owner's Representative.

- B. Submit each sample, according to the quantity of soil required by testing laboratory, to a competent laboratory approved by the Owner's Representative.
- C. Provide analysis of soil samples for pH, salinity, ammonia, phosphate, potassium, calcium, magnesium, boron, and sodium levels. Provide appraisal of chemical properties, including particle size determination, and recommendations for types and quantities of amendments and fertilizers.

3.3 PREPARATION

- A. Clearing of Vegetation:
 - 1. If live perennial weeds exist on site at the beginning of work, spray with a non-selective systemic contact herbicide as recommended and applied by an approved licensed landscape pest control advisor and applicator. Leave sprayed plants intact for at least 15 days.
 - 2. Clear and remove existing weeds by mowing or grubbing off all plant parts at least one-quarter inch ($\frac{1}{4}$) inch below surface of soil over entire areas to be planted.
- B. Soil preparation:
 - 1. Loosen soil in all planting areas, and on slopes flatter than 3:1 gradient, to a depth of six to eight inches (6" - 8") below finish grade. All debris, foreign matter, and stones shall be removed prior to the placing of any fertilizers or conditioners. Soil preparation is for all shrub planting beds, lawn hydroseeded areas and sodded lawn areas.
 - 2. Conduct the required soil tests and instruct the lab to include a minimum of the following soil improvements in the recommendation on the soils report.
 - a. Soil Amendment: Two cubic yards (2 cy) per 1,000 square feet.
 - b. Gro-Power Plus: One hundred fifty pounds (150 lbs) per 1,000 square feet.
 - c. If the lab recommends less than six cubic yards (6 cy) of soil amendment, the excess bid amount shall be applied to the cost of any additional recommended soil improvements, or returned to the Owner as a credit
 - 3. Apply amendments as follows, using rates recommended by the soils testing laboratory (the rates of amendments shown below are for bidding purposes only):
 - a. Fertilizer/Soil Conditioner: Broadcast 150 pounds of Gro Power Plus per 1,000 square feet in all planting areas and rototill to a depth of six to eight inches (6" - 8"). Remove from the site any rock and debris brought to the surface by cultivations. "Cultipack" all areas to receive sod or hydroseed.
 - b. Apply soil amendment to all planting areas at the rate of six cubic yards (6 cy) per 1,000 sf and rototill into the top six to eight inches (6" - 8").
 - 4. Upon completion of finish grading, request an review and obtain approval of Landscape Architect prior to commencement of planting or hydroseeding.

LANDSCAPING
SECTION 32 9000
3595001

C. Finish Grading for all Planting areas

1. Refer to Earthwork Specification Section for Rough Grading.
2. Grade to elevations and contours shown on Drawings. Fill low spots with landscape backfill material and grade to surface drain in manner indicated on Drawings.
3. Finish-grade so that the entire area within the contract lines has a natural and pleasing appearance as specified and as directed by Landscape Architect.
4. Adjust sprinkler heads flush to finish grade in preparation to receive hydroseeding or one-half inch above finish grade in preparation to receive sod. Reset sprinkler heads flush to grade after turf has germinated.
5. Flag the sprinkler heads and valve markers.

D. Planting Pits for Trees:

1. Excavate pits with vertical sides and with bottom of excavation slightly raised at center to provide proper drainage.
2. Set container-grown stock in center of pit on earth pedestal. Separate roots and/or prune roots as directed by Landscape Architect. In hot weather, pre-wet pit. Loosen outside roots from sides and bottom of root ball. When set, place additional backfill around base and sides of root ball. Work each layer to settle backfill and eliminate voids and air pockets. Water after placing final layer of backfill.
3. Loosen hard subsoil in bottom of excavation. Extend excavation as required to insure proper drainage from plant pits.
4. Fill excavated planting pits with water to half the depth of pit. Pits should drain within four hours (4 hrs). If planting pits do not drain, notify Project Inspector immediately. Do not proceed with planting until Landscape Architect has resolved a method to provide drainage.

E. Planting Pits for Shrubs/Groundcover:

1. Excavate pits and trenches with vertical sides and with bottom of excavation slightly raised at center to provide proper drainage.
2. Loosen hard subsoil in bottom of excavation. Extend excavation as required to insure proper drainage from plant pits.
3. Fill excavated planting pits with water to half the depth of pit. Pits should drain within four hours (4 hrs). If planting pits do not drain, notify Project Inspector immediately. Do not proceed with planting until Landscape Architect has resolved a method to provide drainage.

3.4 PLANTING

A. Lawn Sod:

1. Cultivate all lawn areas to a depth of six inches (6"). If cultivation does not break lumps, pull a spike-toothed harrow over the area behind the tractor.
2. Give all lawn areas that are to be sodded a smooth finish to prevent pockets. Do not allow any abrupt changes of surface. Prior to installation of sod, roll the grade with a 200-pound water-ballast roller. Request that the lawn grade be inspected and approved by the Landscape Architect prior to sodding to determine its suitability for planting. Obtain such approval prior to commencing sodding operations.
3. Do not take heavy objects (except lawn rollers) over lawn areas after they have been prepared for planting.
4. Completely lay the sod within twelve hours (12 hrs) of delivery. Do not leave sod on pallets in the hot sun longer than necessary.
5. Unroll sod carefully. Lay sod tight without any visible open joints, and without overlapping; stagger end joints twelve inches (12") minimum. Do not stretch or overlap sod pieces. Do not place sod in pieces smaller than twenty-four inches (24") in length by width of roll.
6. When new sod is to match existing turf, cut the edge of the existing turf in a series of straight lines that will accept new sod rolls in full width of the sod roll. Make the transition of grade between existing turf and new sod to be seamless with no change in elevation.
7. Immediately after laying sod, roll lawn areas with a 200-pound water-ballast roller.
8. Trim sod to conform to lawn shapes designated in Drawings.
9. On slopes of six inches (6") per foot and steeper, lay sod perpendicular to slope and secure every row with wooden pegs at a maximum of two feet (2') on center. Drive pegs flush with soil portion of sod.
10. Ensure that finished appearance is that of one continuous lawn.
11. Do not lay whole lawn before watering. When a conveniently large area has been sodded, water lightly to prevent drying. Continue to lay sod and to water until installation is complete.
12. All sod areas must be approved by Landscape Architect.
13. Water the complete lawn surface thoroughly. Moisten soil at least eight inches (8") deep. Repeat sprinkling at regular intervals to keep sod moist at all times until rooted. After sod is established, decrease frequency and increase amount of water per application as necessary.

LANDSCAPING
SECTION 32 9000
3595001

B. Shrubs:

1. Lay out individual shrub locations and areas for multiple plantings. Stake the locations, outline the areas, and secure the Owner's Representative's acceptance before beginning the planting work. Make minor adjustments as requested.
2. Scarify root ball prior to planting. Plant in holes twice the diameter of the root ball and to a depth equal to the container's height. Place the shrub and/or groundcover so the top of the root ball is one inch (1") higher than the surrounding grade. Set container-grown stock in center of pit. In hot weather, pre-wet the pit. When set, place additional backfill around base and sides of root ball. Work each layer to settle backfill and eliminate voids and air pockets. Thoroughly compact lower half of backfill in plant pit. See staking or guying detail. Water after planting. Provide a berm or watering basin for each tree. Add Vitamin B-1, in the proper solution as recommended by the manufacturer, to the second watering of the basin.
3. Place fertilizer planting tablets in root zone and alongside each plant. Follow manufacturer's instructions for number of tablets to use for each container size.
4. See Drawings for additional information.
5. Grooming and Staking of Trees:
 - a. Prune, thin-out and shape trees in accordance with standard horticultural practice. Prune trees to retain required height and spread. Unless otherwise directed by Landscape Architect, do not cut tree leaders, and remove only injured or dead branches from flowering trees.
 - b. Paint cuts over one-half inch (½") in size with standard tree paint or compound, covering exposed, living tissue. Use paint that is waterproof, antiseptic, adhesive, elastic and free of kerosene, coal tar, creosote, and other substances harmful to plants. Do not use shellac.
 - c. Stake or guy trees immediately after planting, as indicated on Drawings.
6. Grooming of Shrubs:
 - a. Prune, thin-out and shape shrubs in accordance with standard horticultural practice. Prune shrubs to retain natural character and to accomplish their use in landscape design. The required plant size is its size after pruning.
 - b. Remove and replace excessively pruned or malformed new plants resulting from improper pruning.

- C.** Request review by the Landscape Architect after locating, but prior to planting all trees. Under the direction of the Landscape Architect, make slight adjustments to plant material location as necessary to reflect original intention of Drawings.

3.5 WEED CONTROL

- A. Apply pre-emergent weed control to all planting areas (except lawn) after completion of all planting and one complete watering. Follow manufacturer's directions. To prevent washing away of weed control, do not over-water after its application. Do not allow any weed control into lawn areas. Treat any existing noxious weeds, such as Johnson grass, with Roundup in successive treatments until all roots are destroyed, then remove all grass and roots. Notify Owner's Representative of time of installation for verification of application.

3.6 BARK MULCH

- A. Apply mulch at the rate of three inches (3") deep to all planting areas, exclusive of lawn, after the planting and weed control are completed. Twelve inches (12") from planter edges, taper full depth of mulch to meet adjacent grades. Do not place mulch within three inches (3") of trunk or stems.

3.7 CLEAN-UP

- A. During construction, keep the site free of rubbish and debris, and clean up the site promptly when notified to do so. Take care to prevent spillage on streets from hauling and immediately clean up any such spillage and/or debris deposited on streets due to the work of this Section.
- B. During all phases of the construction work, take all precautions to abate dust nuisance by clean-up, sweeping, sprinkling with water, or other means as necessary.
- C. Paving: Maintain cleanliness of paving areas and other public areas used by equipment, and immediately remove spillage; remove rubbish, debris, and other material resulting from landscaping work, leaving site in a safe and clean condition.

3.8 LANDSCAPE MAINTENANCE

- A. The Landscape Maintenance Period will begin when all the Landscape Maintenance Period Requirements have been met (See Part 1 of these Specifications).
- B. Cleaning: Maintain cleanliness on paving areas and other public areas used by equipment and immediately remove all spillage. Remove from project site all rubbish and debris found thereon and all material and debris resulting from landscaping work, leaving the site in a safe and clean condition.
- C. Maintenance:
 - 1. Sprinkler Irrigation System:
 - a. Check system weekly for proper operation. Flush lateral lines out after removing last sprinkler head or two at each end of lateral. Adjust all heads as necessary for unimpeded coverage.

**LANDSCAPING
SECTION 32 9000
3595001**

- b. Set and program automatic controllers for seasonal water requirements. Provide the Owner's Representative with keys to the controllers and instructions on how to turn off system in case of emergency.
 - c. Repair all damages to sprinkler irrigation system as part of the contract work. Make repairs within one watering period or one week, whichever is the least amount of time.
2. Turf Areas:
- a. Begin mowing turf when grass has reached a height of three inches (3") and cut to a height of one-half inches to two inches (1 ½" - 2"). Mow at least weekly after the first cut. Turf must be well-established and free of bare spots and weeds, to satisfaction of Landscape Architect, prior to final acceptance. Do not mow lawns when the soil is not able to support maintenance equipment. Repair wheel marks and ruts caused by the maintenance equipment at no additional cost to the Owner.
 - b. Pick up grass clippings and remove from the site and premises.
 - c. Trim edges at least twice monthly for neat appearance. Vacuum or blow clippings off walks.
 - d. Water the lawns at such frequency as weather conditions require to replenish soil moisture below the root zone. Normally, a total of one and one-half inches (1 ½") of water is needed weekly in hot weather.
 - e. Fertilize the lawn areas at the beginning of the Landscape Maintenance Period and at the completion of the Landscape Maintenance Period. Use a fertilizer with the following characteristics:
 - 1) Slow release, Best 16-6-8, or approved equal, at the rate of 6.25 lbs per 1,000 square feet from March through October.
 - 2) Calcium Nitrate (15-0-0) at the rate of 6.5 lbs per 1,000 square feet from November through February.
 - f. Broadcast fertilizer using a mechanical spreader; do not apply by hand-broadcasting. Sweep all fertilizer off hardscape into adjacent planters.
 - g. Weekly as needed and as directed, re-sod lawn areas with material that matches previously installed material. Use sod to repair any bare areas. Repair areas to receive sod as follows:
 - 1) Mark out areas to receive new sod repair.
 - 2) Cut straight lines that will accept sod the full width of the roll and a minimum of twenty-four inches (24") in length.
 - 3) Transition the grade between existing turf and new sod seamlessly, with no change in elevation.

3. Shrubs:
 - a. Water enough that moisture penetrates throughout root zone and only as frequently as necessary to maintain healthy growth.
 - b. Construct and/or remove water basins around each plant, depending on the time of the year and as directed.
 - c. Do not prune unless directed by the Landscape Architect.
 - d. Replace any dead, dying or vandalized plant material on a weekly basis throughout the Landscape Maintenance Period.
 4. Insecticide and Herbicide Application:
 - a. If needed, control weeds with selective herbicides and sprays. In areas where crabgrass has infested the lawn, apply pre-emergent herbicides such as Dacthal by Amvac, Balan, or Betasan by Gowan for control prior to crabgrass germination. Control insect pests if necessary.
 - b. Use only a licensed Pest Control Operator to apply herbicides and sprays and to maintain a log for applications indicating material, timing, and rate.
- D. Final Acceptance of the Landscape Maintenance Period: request on-site meeting forty-eight hours (48 hrs.) in advance with the Landscape Architect and Owner's Representative to determine the end of the Landscape Maintenance Period.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Domestic water piping system.
 - 2. Fire protection piping systems.
 - 3. Sewer piping system

1.2 RELATED REQUIREMENTS

- A. Section 01 5000, Temporary Facilities and Controls.
- B. Section 01 6116, Volatile Organic Compound (VOC) Restrictions, for VOC limits pertaining to adhesives, sealants, fillers, primers, and coatings.
- C. Section 01 8113, Sustainable Design Requirements, for CAL-Green [and Collaborative for High Performance Schools (CHPS)] general requirements and procedures.
- D. Section 31 0000, Earthwork.
- E. Section 31 2333, Trenching and Backfilling.
- F. Section 32 1600, Site Concrete.

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CAL Green), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- C. California Plumbing Code, (CPC), edition as noted on the Drawings.
- D. California State Health and Safety Code Section 116875, Lead Free Public Water Systems.
- E. Local Jurisdiction: Any work within the street, highway or right-of-way shall be performed in accordance with the requirement of the governmental agencies having jurisdiction, and shall not begin until all of those governing authorities have been notified.
- F. ASTM International (ASTM):
 - 1. D422-63: Test Method for Particle Size Analysis of Soil.
 - 2. D698-00: Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures, Using 5.5 lb (2.49 Kg) Rammer and 12 inch (304.8 mm) Drop.

3. D1556-00: Test Method for Density of Soil in Place by the Sand-Cone Method.
4. D1557-02: Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 10 lb. (4.54 Kg) Rammer and 18 inch (457 mm) Drop.
5. D3017-05: Test Methods for Moisture Content of Soils and Soil-Aggregate Mixture by Nuclear Methods (Shallow Depth).
6. D4318-05: Test Method for Liquid Limit, Plastic Limit, and Plasticity Limit.

G. CALTRANS Standard Specifications.

H. CAL-OSHA, Title 8, Section 1590 (e).

I. NFPA 13, 24 and 25, per CFC chapter 80 and CBC chapter 35.

1.4 ADMINISTRATIVE REQUIREMENTS

A. Submittal Procedures:

1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
3. Sustainable Design Submittals shall comply with the additional requirements of Section 01 8113, Sustainable Design Requirements.

1.5 ACTION SUBMITTALS

- A. Provide supplier's descriptive literature for all products to demonstrate compliance with specified attributes.
- B. Substitution: Provide all data of proposed material being submitted as a substitution. Provide comparison with specified product data and identify all differences. Failure to provide comparison will be reason for rejection.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For contractor / installer.
- B. Provide sieve analysis from accredited testing lab on pipe bedding material. Analysis shall have a current date not older than project contract signing date.
- C. Sustainable Design:
1. General:
 - a. Submit information necessary to establish and document compliance with the California Green Building Standards Code.
 - b. Sustainable design submittals are in addition to other submittals.
 2. The following information shall be provided:
 - a. Adhesives and Sealants: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.

- b. Paints and Coatings: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.

1.7 CLOSEOUT SUBMITTALS

- A. Guarantee: Submit subcontractor's guarantee.
- B. Water Sterilization Test Report.

1.8 QUALITY ASSURANCE

- A. Contractor / Installer shall have been in business for five (5) years providing/finishing similar size projects and complexity.
- B. Contractor shall be solely responsible for all subgrades built. Any repairs resulting from inadequate compaction or incorrect grades will be the responsibility of the contractor.
- C. The representatives of the Owner's testing lab will not act as supervisor of construction, nor will they direct construction operations. Neither the presence of the Owner's testing lab representatives nor the testing by the Owner's testing lab shall excuse the contractors or subcontractors for defects or deficiencies discovered in their work during or following completion of the project. Correcting inadequate compaction is the sole responsibility of the contractor.
- D. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the drawings to be salvaged and re-used.
 - 1. Sun damaged or discolored PVC pipe will be rejected.
- E. All materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.

1.9 FEES, PERMITS, AND UTILITY SERVICES

- A. Obtain and pay for permits and service charges required for installation of Work. Arrange for required inspections and secure written approvals from authorities having jurisdiction.
- B. Upon completion of work within right-of-way, provide copies of written final approval to the Architect.

1.10 DELIVERY, STORAGE AND HANDLING

- A. Transport, store and handle in strict accord with the local jurisdiction and manufacturer's written recommendations
- B. Deliver undamaged products to job in manufacturer's sealed containers and/or original bundles with tags and labels intact.

1.11 EXISTING SITE CONDITIONS

- A. Contractor shall acquaint himself with all site conditions. If unknown active utilities are encountered during work, notify Architect promptly for instructions. Failure to notify will make Contractor liable for damage to these utilities arising from Contractor's operations subsequent to discovery of such unknown active utilities.
- B. Existing civil, mechanical and electrical improvements are shown on respective site plans to the extent known. Should the Contractor encounter any deviation between actual conditions and those shown, he is to immediately notify the Architect before continuing work.

1.12 PROTECTION

- A. Adequate protection measures shall be provided to protect workmen and passers-by on and off the site. Adjacent property shall be fully protected throughout the operations. Blasting will not be permitted. Prevent damage to adjoining improvements and properties both above and below grade. Restore such improvements to original condition should damage occur. Replace trees and shrubs outside building area disturbed by operations.
- B. In accordance with generally accepted construction practices, the Contractor shall be solely and completely responsible for working conditions at the job site, including safety of all persons and property during performance of the work. This requirement shall apply continuously and shall not be limited to normal working hours.
- C. Any construction review of the Contractor's performance conducted by the Geotechnical Engineer is not intended to include review of the adequacy of the Contractor's safety measures, in, on, or near the construction site.
- D. Provide shoring, sheeting, sheet piles and or bracing to prevent caving, erosion or gullyng of sides of excavation.
- E. Surface Drainage: Provide for surface drainage during period of construction in manner to avoid creating nuisance to adjacent areas. The contractor shall make a reasonable effort on a daily basis to provide pumps and all equipment necessary to keep all excavations and the site free from water during entire progress of work, regardless of cause, source, or nature of water.
- F. Adjacent streets and sidewalks shall be kept free of mud, dirt or similar nuisances resulting from earthwork operations.
- G. The site and adjacent influenced areas shall be watered as required to suppress dust nuisance. Dust control measures shall be in accordance with the local jurisdiction.
- H. Trees: Carefully protect existing trees that are to remain. Provide temporary irrigation as necessary to maintain health of trees.

1.13 SEASONAL LIMITS

- A. No fill material shall be placed, spread or rolled during unfavorable weather conditions. When work is interrupted by rains, fill operations shall not be resumed until field tests indicate that moisture content and density of fill are satisfactory.

1.14 RECORD DRAWINGS

- A. Keep a daily record of all pipe placed in ground, verified by Project Inspector.
- B. Upon completion of this Contract, furnish one tracing showing all outside utility lines, piping, etc., installed under this Contract. Locate and dimension all work with reference to permanent landmarks.
- C. All symbols and designations used in preparing "RECORD" drawings shall match those used in Contract drawings.
- D. Properly identify on as-builts and provide dimensions for all stubs for future connections. Provide concrete markers 6" dia. 12" deep, flush with finish grade at the ends of all stubbed pipes.
- E. Provide record drawings per Section 01 3300.

PART 2 - PRODUCTS

2.1 DESIGN AND PERFORMANCE CRITERIA

- A. Sustainable Design:
 - 1. VOC emissions for field-applied adhesives, sealants, and sealant primers must comply with limits specified in Section 01 6116.
 - 2. VOC emissions for field-applied paints and coatings must comply with limits specified in Section 01 6116.

2.2 MATERIALS - GENERAL

- A. Provide each item listed herein or shown on drawings of quality noted or approved equal. All material shall be new, full weight, standard in all respects and in first-class condition. Insofar as possible, all materials used shall be of same brand or manufacture throughout for each class of material or equipment. Materials shall be of domestic manufacture and shall be tested within Continental United States.
- B. Grade or quality of materials desired is indicated by trade names or catalog numbers stated herein.
- C. Dimensions, sizes, and capacities shown are minimum and shall not be changed without permission of Architect.
- D. All materials in this section used for any public water system or domestic water for human consumption shall be lead free.

1. For the purposes of this section, "lead free" means not more than 0.2 percent lead when used with respect to solder and flux and not more than 8 percent when used with respect to pipes and pipe fittings.
2. All pipe, pipe or plumbing fitting or fixtures, solder, or flux shall be certified by an independent American National Standards Institute (ANSI) accredited third party, including, but not limited to, NSF International, as being in compliance with this section.

E. All materials used for fire system piping shall be UL and FM approved.

2.3 VALVE BOXES

- A. Provide at each valve or cock in ground a Christy, Brooks, or equal to Christy G05CT, concrete valve box with cover marked for service, domestic water shall be marked "Water" and fire supply shall be marked "Fire". Furnish extension handles for each size square nut valve, and provide "fork" handle for each size of "wheel handle" valve as required. Do not locate valve boxes in walk, or covered passages, curbs, or curb & gutters, unless necessary. If valve location is within concrete or asphalt paved surface valve box shall be as detailed on plans for such condition. Provide valve box extensions as required to set bottom of valve box to bottom of piping in which valve is installed. Provide Owner with set of special wrenches and/or tools as required for operation of valves.

2.4 PIPES AND FITTINGS

- A. Sanitary Sewer: PVC sewer pipe and fittings with Ring-Tite joints, ASTM D3034 SDR35.
- B. Domestic water Lines 3 1/2" and smaller: Type K copper tubing, hard temper, with wrought copper fittings. Schedule 80 PVC, ASTM D 1784, ASTM D 1785.
- C. Water lines 4" and larger: AWWA C-900 Class 150/DR18 with rubber gasket joints.
- D. Fire lines 4" and larger: AWWA C-900 Class 200/DR14 with rubber gasket joints.
- E. Solder: Lead Free. 95/5; 95% Tin / 5% Antimony.
- F. Ductile Iron Pipe; AWWA Class 51, Cement Lined
- G. Ductile Iron Pipe Fittings; AWWA C110, C153, Ebba Iron, Star Romac, Sigma, or approved equal.
- H. PVC Mechanical Fittings; Ebba Iron, Star; Romac; Sigma or approved equal.
- I. Ductile Iron Pipe/PVC C-900 Pipe Restrained Fittings; Ebba Iron # 3800 Mega Coupling, Ebba Iron 1100CH Split Restrained Harness for pipe couplings. StarGrip Series 4000.
- J. Ductile Iron Pipe/PVC C900, C905 Restrained Degreedand Blind Cap Fittings,;
- K. Mega Lug; Sigma; Romac; or an approved equal

- L. Mechanical Fitting Bolts; Bolts and nuts shall be carbon steel with a minimum 60,000 psi tensile strength conforming to ASTM A 307, Grade A. Bolts shall be standard ANSI B1.1 Class 2A course threads. Nuts shall conform to ASTM A 563 and be standard ANSI B1.1, Class 2A course thread. All bolts and nuts shall be zinc coated.
- M. Fasteners Anti-Rust Coatings; After assembly, coat all fasteners with an Asphaltic Bituminous coatings conforming to latest edition NFPA 24.
- N. Ductile Iron Pipe Wrap; 8 mil polyethylene pipe wrap conforming to ANSI/AWWA C105/A21.5 standards.
- O. Pipe Insulation; Pipe exposed to atmospheric conditions ½" thru 4" NPT; Johns Manville rigid fiberglass insulation, Micro Lok HP; Owens Corning Fiberglas SSL II; Conforming to ASTM C 612, Type 1A or type 1B.
- P. Aluminum field applied pipe insulation jacket; comply with ASTM B209, ASTM C1729, ASTM C1371 Manufacturers; Childers Metals; ITW Insulation Systems Aluminum Jacketing; or an approved equal.
 - 1. Finish shall be flat mill finish
 - 2. Factory Fabricated Fitting Covers; 45 and 90 degree elbows, tee's, valve covers, end caps, unions, shall be of the same thickness and finish of jacket.
 - 3. The fittings shall be composed of 2-pieces
 - 4. Adhesives; per the manufacturers requirements
 - 5. Joint Sealant; shall be silicone, and shall be aluminum in color.
- Q. Sewer Forced Main; HDPE, DR 11, color gray with green stripe by JM Eagle or approved equal.

2.5 SANITARY SEWER MANHOLES

- A. Shall be constructed as shown on plan details.

2.6 CLEANOUTS

- A. Cleanouts of same diameter as pipe up to 8" in size shall be installed in all horizontal soil and waste lines where indicated and at all points of change in direction. Cleanouts shall be located not less than 18" from building so as to provide sufficient space for rodding. No horizontal run over 100 feet shall be without cleanout whether shown on drawings or not.
- B. All cleanout boxes shall be traffic rated with labeled lid, Christy G05CT or approved equal. Lid shall be vandal proof with stainless steel screws

2.7 UNIONS

- A. Furnish and install one union at each threaded or soldered connection to equipment and 2 unions, one on each side of valves on pipes ½" to 3".

- B. Locate unions so that piping can be easily disconnected for removal of equipment or valve. Provide type specified in following schedule:

Type of Pipe Union

Steel Pipe: 150 lb. Screwed malleable ground joint, brass, brass-to-iron seat, black or galvanized to match pipe.

Copper tubing: Brass ground joint with sweat connections.

PVC Sch 80 pipe: PVC union, FIPT X FIPT

2.8 VALVES

- A. Provide valves as shown and other valves necessary to segregate branches or units. Furnish valves suitable for service intended. Valves shall be properly packed and lubricated. Valves shall be non-rising stem. Place unions adjacent to each threaded or sweat fitting valve. Install valves with bonnets vertical. All valves shall be lead free.
- B. Valves ½" thru 2"; shall be made of bronze, full size of pipe and lead free. Nibco S-113-FL Series; American G-300 Series; Matco 511 FL Series; Apollo 102T-FL Series. Brass valves of brass parts within valves will not be accepted.
- C. Valves, 2 ½" thru 3" shall be class 150; Shall be made of bronze, full size of pipe; Jenkins Fig. 2310 J; Lunkinheimer Fig. 2153; Crane Fig. 437; Stockham Fig. B-128.
- D. Valves, Flanged; 4" thru 12" Ductile Iron Resilient Wedge Gate Valve; Nibco F 609 RW; American 2500 Series; Kennedy 8561; Mueller 2360 Series.

2.9 TAPPING SLEEVE

- A. Shall be used on pipe sizes 6" thru 12" and shall be made with stainless steel material including stainless steel bolts. Flanges shall be ductile iron or high carbon steel. Gaskets shall seal full circumference of pipe. Shall be manufactured for operating pressure of 200 psi, and shall pass test pressure of 300 psi. Romac SST series; Smithblair 662; Mueller H304; Ford "FAST" tapping sleeve.

2.10 SERVICE SADDLES

- A. Shall be used on pipe size 2" thru 4". Body shall be made from ductile iron with epoxy coating or bronze. Cascade Style CSC-1; A.Y. McDonald model 3891 AWWA/3892 FNPT; Smith-Blair #317; Ford S70, S71, S90, (style B).

2.11 TRACER WIRE

- A. No. 10 THW solid copper wire. Solder all joints

PART 3 - EXECUTION

3.1 DRAWINGS AND COORDINATION

- A. General arrangement and location of piping, etc., are shown on Drawings or herein specified. Install work in accord therewith, except for minor changes that may be necessary on account of other work or existing conditions. Before excavation, carefully examine other work that may conflict with this work. Install this work in harmony with other craft and at proper time to avoid delay of work.
- B. Verify invert elevations at points of connection to existing systems prior to any excavation. If invert elevations differ from that shown on drawings, notify Architect immediately.
- C. In advance of construction, work out minor changes if conflicts occur with electrical or mechanical. Relocate services to suit actual conditions and work of other trades to avoid conflict therewith. Any adjustments or additional fittings to make adjustments shall not be cause for additional costs to the owner.
- D. Execute any work or apparatus shown on drawings and not mentioned in specifications, or vice versa. Omission from Drawings or Specifications of any minor details of construction, installation, materials, or essential specialties does not relieve Contractor of furnishing same in place complete.
- E. Graded pipes shall take precedence. If conflict should occur while placing the domestic water and fire service piping, the contractor shall provide any and all fittings necessary to route the water lines over such conflicting pipes at no additional costs to the owner.

3.2 ACCESS

- A. Continuously check for clearance and accessibility of equipment or materials specified herein to be placed. No allowance of any kind shall be made for negligence on part of Contractor to foresee means of installing his equipment or materials into proper position.

3.3 EXCAVATING AND BACKFILLING

- A. Excavation and Bedding:
 - 1. General: Trench straight and true to line and grade with bottom smooth and free of irregularities or rock points. Trench width to be a minimum of 12" wider than outside diameter of pipe. Follow manufacturer's recommendations for use of each kind and type of pipe.
 - 2. Bedding: Provide a bedding as noted on drawing details for the full length of the pipe. Bedding shall have a minimum thickness beneath the pipe of 4" or 1/8 the outside diameter of the pipe, which ever is greater. Provide bell holes and depressions for pipe joints only of size required to properly make joint.
 - 3. If the trenches for the site utilities falls within areas to be lime treated, the piping shall be installed prior to any lime treatment operations, providing the elevation of the piping is below the treatment section.

UTILITIES
SECTION 33 0000
3595001000

- a. If trenching is necessary in areas that have been previously lime treated the contractor shall backfill the trench with class 2 aggregate base, with minimum section equal to the lime treated section and compacted to 95%.

B. Laying of Pipe:

- 1. General: Inspect pipe prior to placing. Sun damaged pipe will be rejected. Set aside any defective or damaged material. Do not place pipe in water nor place pipe when trenches or weather are unsuitable. Lay pipe bell up grade, true to line and grade.
 - a. Sewer pipe shall be laid in strict conformity to the prescribed line and grade, with grade bars set and each pipe length checked to the grade line. Three consecutive points on the same rate of slope shall be used at all times to detect any variation from a straight grade. In any case of discrepancy, work shall be stopped and the discrepancy immediately reported to the Owner's Representatives. In addition, when requested by the Owner's Representative, a string line shall be used in the bottom of the trench to insure a straight alignment of the sewer pipe between manholes. The maximum deviation from grade shall not be in excess of 1/4 inch. In returning the pipe to grade, no more than 1/4" depression shall result.
 - b. The Contractor shall expose the end of existing pipe to be extended, for verification of alignment and elevation, prior to trenching for any pipe which may be affected. All costs of such excavation and backfill shall be included in the price paid for the various items of work.
 - c. A temporary plug, mechanical type shall be installed on sewer pipe at the point of connection to existing facilities. If connecting to a public facility the plug shall conform to the requirements of the local jurisdiction. This plug shall remain in place until the completion of the balling and flushing operation.
- 2. Bell and Spigot Joints: Lubricate inside of bells and outside of spigots with soap solution. Wedge joints tight. Bell of bell and spigot pipe to be pointed up grade.

C. Backfilling:

- 1. General: Do not start backfill operations until required testing has been accomplished.
- 2. Compaction and Grading: Remainder of backfill shall be in accordance with Section 31 2333 – TRENCHING AND BACKFILLING.
- 3. If trenching in area previously lime or cement treated backfill top of trench section, same depth as lime or cement treatment with Class 2 Aggregate Base compacted to 95% minimum relative compaction.

3.4 INSTALLATION OF WATER PIPING

- A. Immediately cap or plug ends of, and opening in, pipe and fittings to exclude dirt until final connections made. Use reducing fittings where any change in pipe size occurs. Bushings shall not be used.

- B. General: Should existing conditions or other work prevent the running of pipes or the setting of equipment at the points indicated by drawings, changes as authorized by the Architect shall be made without additional cost to the Owner.
- C. All bolts used on mechanical fittings shall be thoroughly coated with an asphaltic bituminous coating conforming to 2019 NFPA (National Fire Protection Association) 10.3.5.2 and 10.8.3.5, CBC chapter 35 and CFC chapter 80.
- D. All buried metal shall be incased with 8 mil polyethylene wrap so that no soil is in contact with metal. Ends of polyethylene wrap shall be taped to provide seal with pipe.
- E. Do not install water lines in same trench with non-metallic sewer lines unless bottom of water pipe at all points is at least 12" above top of sewer line and water line is placed on solid shelf excavated at one side of common trench with a minimum of 12 inch horizontal separation.
- F. Under no circumstance shall a fitting be located directly under a structural footing without prior approval from the Architect.
- G. In locations where existing domestic pipe is rerouted, the new pipe shall be assembled using restrained fittings at all joints including factory pipe joints. Tapped restrained blind flanges shall be temporarily installed at each end of the assembled pipes until testing and chlorination is completed and approved.

3.5 CLOSING IN OF UNINSPECTED WORK

- A. Do not allow or cause work installed to be covered up or enclosed before it has been inspected, tested, and approved. Should work be enclosed or covered up before it has been approved, uncover work at own expense. After it has been inspected, tested and approved, make repairs necessary to restore work of other contractors to condition in which it was found at time of cutting.

3.6 CARE AND CLEANING

- A. Repair or replace broken, damaged, or otherwise defective parts, materials, and work. Leave entire work in new condition satisfactory to Architect. At completion, carefully clean and adjust equipment, fixtures and trim that are installed as part of this work. Leave systems and equipment in satisfactory new operating condition.
- B. Drain and flush piping to remove grease and foreign matter.
- C. Sewer piping shall be balled and flushed.
- D. Clean out and remove surplus materials and debris resulting from the work, including surplus excavated material.
- E. Flush fire service piping in the presence of the project inspector. Flushing shall be continued for a sufficient time as necessary to ensure all foreign material has been removed. Flow rate shall be equal to site fire flow requirements.

3.7 SEWER INTERNAL INSPECTIONS

- A. Upon completion of construction and prior to final inspection, the Contractor shall clean the entire new pipeline of all dirt and debris. Any dirt or debris in previously existing pipes or ditches in the area, which resulted from the new installation, shall also be removed. Pipes shall be cleaned by the controlled balling and flushing method. Temporary plugs shall be installed and maintained during cleaning operations at points of connection to existing facilities to prevent water, dirt, and debris from entering the existing facility.

3.8 TEST OF PIPING

- A. Pressure Test piping at completion of roughing-in, in accord with following schedule, and show no loss in pressure or visible leaks after minimum duration or four (4) hours at test pressures indicated.
- B. Chlorination tests shall be performed after all fixtures and any required mechanical devices are installed and the entire system is complete and closed up.
- C. In cases where new domestic water piping is assembled for re-routing of existing domestic water pipe, the contractor shall perform the following testing prior to connecting the new water pipe to the existing system.
 - 1. The pipe shall be pressure tested and per the test schedule.
 - 2. The pipe shall be pressure tested down within the trench.
 - 3. The contractor shall dig a temporary ditch below the existing pipe to drain to a sump that is lower than the bottom of the trench and to the side of the trench. The sump shall be 30% larger than the total volume of water within the testing pipe assembly.
 - 4. After pressure testing and chlorination has taken place and accepted, the contractor shall drain the pipe into the sump and pump the sump out as it is filling.
 - 5. The temporary test fittings at each end of the pipe assembly shall be removed and the final restrained couplings installed.
 - 6. The existing piping shall be cut and the water within the pipe shall drain below the pipe to the temporary sump. Pump the sump as it is being filled up. Take extreme caution not to contaminate the existing pipe with any contaminants within the trench.
 - 7. Before making the final coupling connections, the restrained couplings at each end of the new pipe shall be thoroughly swabbed inside the fitting with a solution of chlorine mixed with water at a rate of 1 part chlorine to 4 parts potable water.
 - 8. After final connections are made, a visual inspection shall be made after fittings are wiped off. If after 1 hr, no noticeable drips are noted the pipe can be backfilled.
 - 9. The contractor shall flush all water piping affected by chlorination until it is within acceptable levels approved by certified testing lab.

TEST SCHEDULE

<u>System Tested</u>	<u>Test Pressure PSIG Test With</u>
Public Water Mains	Per local jurisdiction requirements.
Private Domestic Water Piping:	150 Lbs. Water 4 hrs.
Fire Protection Piping:	200 Lbs. Water pressure, 4 hrs duration with no pressure loss.
Sanitary Sewer Piping:	Sewer system shall be tested for leakage per local jurisdiction requirements.

- D. Testing equipment, materials, and labor shall be furnished by contractor.

3.9 WATER SYSTEM STERILIZATION

- A. Public Water Mains: Shall be flushed and disinfected per the local jurisdiction requirements
- B. Clean and disinfect all site water systems connected to the domestic water systems in accordance with AWWA Standard C651 and as required by the local Building and Health Department Codes, and EPA.
 - 1. Clean and disinfect industrial water system in addition to the domestic water system.
 - 2. Disinfect existing piping systems as required to provide continuous disinfection upstream to existing valves. At Contractors option, valves may be provided to isolate the existing piping system from the new piping system.
- C. Domestic water sterilization shall be performed by a licensed "qualified applicator" as required by CAL-EPA Pesticide Enforcement Branch for disinfecting and sterilizing drinking water.
- D. Disinfecting Agent: Chlorine product that is a registered product with Cal-EPA for use in California potable water lines, such as Bacticide, CAL-EPA Registration No. 37982-20001.
- E. Contractor to provide a 1" service valve connected to the system at a point within 2'-0" of its junction with the water supply line. After sterilization is complete Contractor to provide cap at valve.
- F. Sterilization Procedure to be as follows:
 - 1. Flush pipe system by opening all outlets and letting water flow through the system until clear water flows from all outlets.

UTILITIES
SECTION 33 0000
3595001000

2. Inject disinfecting agent to provide a minimum chlorine residual concentration of at least 50 parts per million (ppm) of free chlorine at each outlet.
 3. Provide sign at all outlets which reads "Water Sterilization in Progress – Do not operate". Remove signs at conclusion of test.
 4. Close all outlets and valves, including valve connecting to water supply line and 1" service valve. Retain treated water in pipe for a minimum of twenty-four hours. Should chlorine residual at pipe extremities be less than 50 PPM at this time, pipe shall be re-chlorinated. As an option, the water systems may be filled with a water-chlorine solution containing a minimum of 200 PPM of chlorine and allowed to stand for three hours.
 5. After chlorination, flush lines of chlorinated water and refill from domestic supply. Continue flushing until residual chlorine is less than or equal to 0.2 ppm, or a residual the same as that of the test water.
- G. Chemical and bacteriological tests shall be conducted by a state-certified laboratory and approved by the local authorities having jurisdiction.
- H. Submit written report to Health Department as required by State Regulations. Provide a copy of report to Architect prior to completion of project.
- I. The costs of sterilization and laboratory testing shall be paid for by the contractor.

3.10 CLEANING

- A. Upon completion of work of this Section promptly remove from the working area all scraps, debris and surplus material of this Section.

END OF SECTION

s:\master specifications\division 33 - utilities\33 0000_utilities.docx
Formatting Updated: 9-13-21

PART 1 - GENERAL

1.1 SUMMARY

- A. Summary Includes:
 - 1. Storm drainage piping systems.

1.2 RELATED REQUIREMENTS

- A. Section 01 5000, Construction Facilities and Controls.
- B. Section 01 6116, Volatile Organic Compound (VOC) Restrictions, for VOC limits pertaining to adhesives, sealants, fillers, primers, and coatings.
- C. Section 01 8113, Sustainable Design Requirements, for CAL-Green general requirements and procedures
- D. Section 31 0000, Earthwork.
- E. Section 31 2333, Trenching and Backfilling.
- F. Section 32 1200, Asphalt Concrete Paving.
- G. Section 32 1600, Site Concrete

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CAL Green), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- C. California Plumbing Code, (CPC), edition as noted on the Drawings.
- D. Local Jurisdiction: Any work within the street, highway or right-of-way shall be performed in accordance with the requirement of the governmental agencies having jurisdiction, and shall not begin until all of those governing authorities have been notified.
- E. ASTM International (ASTM):
 - 1. D 422-63 Test Method for Particle Size Analysis of Soil.
 - 2. D698-00 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures, Using 5.5 lb (2.49 Kg) Rammer and 12 inch (304.8 mm) Drop.
 - 3. D1556-00 - Test Method for Density of Soil in Place by the Sand-Cone Method.
 - 4. D1557-02 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 10 lb. (4.54 Kg) Rammer and 18 inch (457 mm) Drop.

STORM DRAINAGE UTILITIES
SECTION 33 4000
3595001000

5. D 3017-05 Test Methods for Moisture Content of Soils and Soil-Aggregate Mixture by Nuclear Methods (Shallow Depth).
6. D 4318-05 Test Method for Liquid Limit, Plastic Limit, and Plasticity Limit.

F. CALTRANS Standard Specifications.

G. CAL-OSHA, Title 8, Section 1590 (e).

1.4 ADMINISTRATIVE REQUIREMENTS

A. Submittal Procedures:

1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
3. Sustainable Design Submittals shall comply with the additional requirements of Section 01 8113, Sustainable Design Requirements.

1.5 ACTION SUBMITTALS

- A. Provide supplier's descriptive literature for all products to demonstrate compliance with specified attributes.
- B. Substitution: Provide all data of proposed material being submitted as a substitution. Provide comparison with specified product data and identify all differences. Failure to provide comparison will be reason for rejection.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: Contractor / installer.
- B. Provide sieve analysis from accredited testing lab on pipe bedding material. Analysis shall have a current date not older than project contract signing date.
- C. Sustainable Design:
1. General:
 - a. Submit information necessary to establish and document compliance with the California Green Building Standards Code.
 - b. Sustainable design submittals are in addition to other submittals.
 2. The following information shall be provided:
 - a. Adhesives and Sealants: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.
 - b. Paints and Coatings: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.

1.7 CLOSEOUT SUBMITTALS

- A. Guarantee: Submit subcontractor's guarantee.

1.8 QUALITY ASSURANCE

- A. Contractor / Installer shall have been in business for five (5) years providing/finishing similar size projects and complexity.
- B. Contractor shall be solely responsible for all subgrades built. Any repairs resulting from inadequate compaction are the responsibility of the contractor.
- C. The representatives of the Owner's testing lab will not act as supervisor of construction, nor will they direct construction operations. Neither the presence of the Owner's testing lab representatives nor the testing by the Owner's testing lab shall excuse the contractors or subcontractors for defects discovered in their work during or following completion of the project. Correcting inadequate compaction is the sole responsibility of the contractor.
- D. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.
 - 1. Sun damaged or discolored PVC pipe will be rejected.
- E. All materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.

1.9 DELIVERY, STORAGE AND HANDLING

- A. Transport, store and handle in strict accord with the local jurisdiction and manufacturer's written recommendations
- B. Deliver undamaged products to job in manufacturer's sealed containers and/or original bundles with tags and labels intact.

1.10 EXISTING SITE CONDITIONS

- A. Contractor shall acquaint himself with all site conditions. If unknown active utilities are encountered during work, notify Architect promptly for instructions. Failure to notify will make Contractor liable for damage to these utilities arising from Contractor's operations subsequent to discovery of such unknown active utilities.
- B. Existing civil, mechanical and electrical improvements are shown on respective site plans to the extent known. Should the Contractor encounter any deviation between actual conditions and those shown, he is to immediately notify the Architect before continuing work.

1.11 PROTECTION

- A. Adequate protection measures shall be provided to protect workmen and passers-by on and off the site. Adjacent property shall be fully protected throughout the operations.

STORM DRAINAGE UTILITIES
SECTION 33 4000
3595001000

Blasting will not be permitted. Prevent damage to adjoining improvements and properties both above and below grade. Restore such improvements to original condition should damage occur. Replace trees and shrubs outside building area disturbed by operations.

- B. In accordance with generally accepted construction practices, the Contractor shall be solely and completely responsible for working conditions at the job site, including safety of all persons and property during performance of the work. This requirement shall apply continuously and shall not be limited to normal working hours.
- C. Any construction review of the Contractor's performance conducted by the Geotechnical Engineer is not intended to include review of the adequacy of the Contractor's safety measures, in, on, or near the construction site.
- D. Provide shoring, sheeting, sheet piles and/or bracing to prevent caving, erosion or gullyng of sides of excavation.
- E. Surface Drainage: Provide for surface drainage during period of construction in manner to avoid creating nuisance to adjacent areas. The contractor shall make a reasonable effort on a daily basis to provide pumps and all equipment necessary to keep all excavations and the site free from water during entire progress of work, regardless of cause, source, or nature of water.
- F. Adjacent streets and sidewalks shall be kept free of mud, dirt or similar nuisances resulting from earthwork operations.
- G. The site and adjacent influenced areas shall be watered as required to suppress dust nuisance. Dust control measures shall be in accordance with the local jurisdiction.
- H. Trees: Carefully protect existing trees that are to remain.

1.12 SEASONAL LIMITS

- A. No fill material shall be placed, spread or rolled during unfavorable weather conditions. When work is interrupted by rains, fill operations shall not be resumed until field tests indicate that moisture content and density of fill are satisfactory.

1.13 TESTING

- A. General: Refer to Section 01 4523 – Testing and Inspection Services, and Structural Tests and Inspections List, DSA-103.
- B. Geotechnical Engineer: Owner is retaining a Geotechnical Engineer to determine compliance of fill with Specifications, and to direct adjustments in fill operations. Costs of Geotechnical Engineer will be borne by Owner; except those costs incurred for re-tests or re-inspection will be paid by Owner and backcharged to Contractor.

1.14 RECORD DRAWINGS

- A. Keep a daily record of all pipe placed in ground, verified by Project Inspector.

STORM DRAINAGE UTILITIES
SECTION 33 4000
3595001000

- B. Upon completion of this Contract, furnish one tracing showing all outside utility lines, piping, etc., installed under this Contract. Locate and dimension all work with reference to permanent landmarks.
- C. All symbols and designations used in preparing "RECORD" drawings shall match those used in Contract drawings.
- D. Properly identify all stubs for future connections, as to location and use, by setting of concrete marker at finished grade in the manner suitable to Architect.

PART 2 - PRODUCTS

2.1 DESIGN AND PERFORMANCE CRITERIA

- A. Sustainable Design:
 - 1. VOC emissions for field-applied adhesives, sealants, and sealant primers must comply with limits specified in Section 01 6116.
 - 2. VOC emissions for field-applied paints and coatings must comply with limits specified in Section 01 6116.

2.2 MATERIALS

- A. Pipe: Use one of the following, unless noted on the Drawings otherwise.
 - 1. Polyvinyl Chloride Pipe (PVC): SDR35 conforming to ASTM D3034 with elastomeric joints conforming to ASTM D3212 for pipe to 12". Sun damaged pipe will be rejected.
 - 2. High density polyethylene pipe (HDPE): The pipe shall be corrugated exterior/smooth interior pipe. 12" to 60" maximum diameter shall conform to AASHTO M294, water tight per ASTM D3212 with water tight gasket fittings.
- B. Perforated Pipe (for subdrains): Shall be ADS N12 pipe, 3 hole, ASTM F 405, AASHTO M 252; PCV ASTM D3034 SDR-35 storm drain pipe
- C. Manhole: Shall be as shown on the drawing details.
- D. Drop Inlet: Shall be as shown on the drawing details.
- E. Curb Inlet: Shall be as shown on the drawing details.
- F. Mortar: For pipe connections to concrete drainage structures, conform to ASTM C270 type N mortar. Place within one half hour after adding water.
- G. Crushed Rock: Imported washed crushed rock. Minimum 100% passing 3/4 inch sieve.
- H. Trench drain: Polycast, Polydrain or equal and as shown on drawings.
- I. Area Drains: Shall be as shown on the drawing details.

STORM DRAINAGE UTILITIES
SECTION 33 4000
3595001000

- J. Floor Drains: Shall be as shown on the drawing details.
- K. Clean-outs: Shall be as shown on the drawing details.
- L. Planter drains: Shall be as detailed on the drawing details.
- M. Filter Fabric: Mirafi 140N.

PART 3 - EXECUTION

3.1 INSPECTION LAYOUT AND PREPARATION

- A. Prior to installation of the work of this Section, carefully inspect and verify by field measurements that installed work of all other trades is complete to the point where this installation may properly commence
- B. Layout all work, establish grades, locate existing underground utilities, set markers and stakes, setup and maintain barricades and protection facilities; all prior to beginning actual earthwork operations. Layout and staking shall be done by a licensed Land Surveyor or Professional Civil Engineer.
- C. Verify that specified items may be installed in accordance with the approved design.
- D. In event of discrepancy, immediately notify Owner and the Architect. Do not proceed in discrepant areas until discrepancies have been fully resolved.

3.2 EXCAVATION AND BACKFILLING

- A. General: Installation shall be in strict conformance with referenced standards, the manufacturer's written directions, as shown on the drawings and as herein specified.
- B. Verify invert elevations at points of connection to existing systems prior to any excavation. If invert elevations differ from that shown on drawings, notify Architect immediately.
- C. Excavation and Bedding:
 - 1. General: Trench straight and true to line and grade with bottom smooth and free of irregularities or rock points. Trench width in accordance with pipe manufacturer's recommendations and as per the drawings. Follow manufacturer's recommendations for use of each kind and type of pipe.
 - 2. Bedding: Provide bedding as detailed on plans for the full length of the pipe. Bedding shall have a minimum thickness beneath the pipe of 4" or 1/8 the outside diameter of the pipe, whichever is greater. Provide bell holes and depressions for pipe joints only of size required to properly make joint.
 - 3. If the trenches for the site drainage fall within areas to be lime treated, the piping shall be installed prior to any lime treatment operations.
 - a. If additional piping is added to previously lime treated areas, the contractor shall backfill the trench with class 2 aggregate base and compact to 95%.

STORM DRAINAGE UTILITIES
SECTION 33 4000
3595001000

D. Laying of Pipe:

1. General: Inspect pipe prior to placing. Set aside any defective or damaged material. Do not place pipe in water nor place pipe when trenches or weather are unsuitable. Lay pipe upgrade, true to line and grade.
2. Bell and Spigot Joints: Lubricate inside of bells and outside of spigots with soap solution or as recommended by manufacture. Wedge joints tight. Bell of bell and spigot pipe to be pointed upgrade.
3. Pipe shall be bedded uniformly throughout its length.
4. Pipe elevation shall be within 0.02 feet of design elevation as shown on plans.
5. Off Site Work: All work beyond the property lines shall be done in strict conformance with the requirements of the governing agency.

E. Backfilling:

1. General: Do not start backfill operations until required testing has been accomplished.
2. Trenches and Excavations: Backfill with material as detailed on plans, filling both sides of the pipe at the same time, carefully tamping to hold pipe in place without movement. Refer to Section 31 2333 – TRENCHING AND BACKFILLING for fill above this layer.

F. Grouting of Pipes: Grout pipes smooth and water tight at drop inlet, manholes, and curb inlets. Grout back side of hood at curb inlets all grouting shall be smooth and consistent.

G. Off Site Work: All work beyond the property lines shall be done in strict conformance with the requirements of the local agency.

H. Cutting and Patching: Remove and replace existing surface features per applicable specification section (i.e. asphaltic concrete or concrete paving) where pipe is installed in areas of existing improvements.

3.3 TOLERANCES

A. Storm Drain structure grates

1. In landscape and lawn areas $\pm 0.05'$.
2. In sidewalk and asphalt pavement $\pm 0.025'$.
3. In curb and gutter application $\pm 0.0125'$.

B. Cleanout Boxes and Lids

1. In landscape areas; 0.10 higher than surrounding finish grade, $\pm 0.05'$.
2. In sidewalks and asphalt pavement; Flush with surrounding finish grade, $\pm 0.025'$.

3.4 DEWATERING

A. Contractor to provide trench dewatering as necessary, no matter what the source is, at no additional cost to the owner.

STORM DRAINAGE UTILITIES
SECTION 33 4000
3595001000

3.5 FLUSHING

- A. The Contractor shall thoroughly ball and flush the storm drain system to remove all dirt and debris. Discharge water to an approved location.

3.6 CLEANING

- A. Upon completion of work of this Section promptly remove from the working area all scraps, debris and surplus material of this Section.
- B. Clean the dirt, rocks, and debris from the drop inlets and storm drain manholes.

END OF SECTION

**Poet-Christian Elementary School -
TK Portable Classroom Building**

1701 S. Central Ave., Tracy, CA 95376

3595001

Tracy Unified School District

1875 W Lowell Ave., Tracy, CA 95376



April 17, 2024

Poet-Christian Elementary School - TK Portable Classroom Building
Tracy Unified School District
Tracy, California

February 29, 2024

HMC # 3595001

DSA Appl. #02-122130
DSA File #39-73

IDENTIFICATION STAMP
DIV. OF THE STATE ARCHITECT

APP: 02-122130 INC:

REVIEWED FOR

SS ☒ FLS ☒ ACS ☒

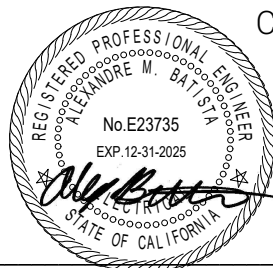
DATE: 04/17/2024



HMC ARCHITECTS
Architect



Warren Consulting Engineers
Civil Engineer



Optimized Energy & Facilities Consulting
Electrical Engineer



MTW Group
Landscape Architect

TABLE OF CONTENTS

DIVISION 00 - PROCUREMENT AND CONTRACTING REQUIREMENTS - NOT USED

DIVISION 01 - GENERAL REQUIREMENTS

SECTION	01 1100 - Summary of Work
	01 2513 - Product Options and Substitutions
	01 2600 - Changes in the Work
	01 2900 - Application for Payment and Conditional and Unconditional Waiver and Release Forms
	01 3119 - Project Meetings
	01 3213 - Scheduling of Work
	01 3300 - Submittal Procedures (Including Submittal Transmittal, Substitution Request, RFI, Electronic Data Request, Megger Grounding Test Certificate, Certification of Chlorination and Sterilization, Certification of Compliance for Building Materials)
	01 3513.23 - Site Standards
	01 3543 - Environmental Procedures
	01 4100 - Regulatory Requirements
	01 4213 - Abbreviations and Acronyms
	01 4216 - Definitions
	01 4219 - References
	01 4300 - Materials and Equipment
	01 4500 - Quality Control
	01 4523 - Testing and Inspection Services
	01 5000 - Temporary Facilities and Controls
	01 5013 - Construction Waste Management and Disposal
	01 5213 - Field Offices
	01 6116 - Volatile Organic Compound (VOC) Restrictions
	01 6600 - Product Delivery Storage and Handling
	01 7329 - Cutting and Patching
	01 7600 - Alteration Project Procedures
	01 7700 - Contract Closeout and Final Cleaning
	01 7823 - Operation and Maintenance Data
	01 7836 - Warranties (Including Contractor Standard Warranty Form, Subcontractor Standard Warranty Form, Special Extended Warranty Form)
	01 7839 - Record Documents
	01 8113 - Sustainable Design Requirements

DIVISION 02 - EXISTING CONDITIONS - NOT USED

DIVISION 03 - CONCRETE - NOT USED

DIVISION 04 - MASONRY - NOT USED

DIVISION 05 - METALS - NOT USED

DIVISION 06 - WOOD, PLASTICS, AND COMPOSITES - NOT USED

DIVISION 07 - THERMAL AND MOISTURE PROTECTION

SECTION	07 9200 - Joint Sealants
---------	--------------------------

DIVISION 08 - OPENINGS - NOT USED

DIVISION 09 - FINISHES

SECTION	09 9100 - Painting
---------	--------------------

DIVISION 10 - SPECIALTIES

SECTION	10 1116 - Markerboards
---------	------------------------

TABLE OF CONTENTS

10 1400 - Signage
10 2813 - Toilet Accessories
10 4416 - Fire Extinguishers and Cabinets

DIVISION 11 - EQUIPMENT - NOT USED

DIVISION 12 - FURNISHINGS

SECTION 12 2113 - Horizontal Louver Blinds
12 3216 - Manufactured Plastic-Laminate-Clad Casework
12 3623 - Plastic-Laminate-Clad Countertops

DIVISION 13 - SPECIAL CONSTRUCTION - NOT USED

DIVISION 14 - CONVEYING EQUIPMENT - NOT USED

DIVISION 21 - FIRE SUPPRESSION - NOT USED

DIVISION 22 - PLUMBING - NOT USED

DIVISION 23 - HEATING, VENTILATING AND AIR CONDITIONING (HVAC) - NOT USED

DIVISION 26 - ELECTRICAL

SECTION 26 0100 - Electrical Basic Requirements
26 0533 - Raceway and Boxes for Electrical Systems
26 2716 - Cabinets and Enclosures
26 2800 - Circuit Protective Devices
26 6116 - Fire Alarm

DIVISION 27 - COMMUNICATIONS

SECTION 27 1000 - Data Communications
27 5123 - Sound and Communications

DIVISION 28 - ELECTRONIC SAFETY AND SECURITY

SECTION 28 3100 - Intrusion Alarm System

DIVISION 31 - EARTHWORK

SECTION 31 0000 - Earthwork
31 2333 - Trenching and Backfilling

DIVISION 32 - EXTERIOR IMPROVEMENTS

SECTION 32 1600 - Site Concrete
32 3113 - Chain Link Fences and Gates
32 8000 - Irrigation
32 9000 - Landscaping

DIVISION 33 - UTILITIES

SECTION 33 0000 - Utilities
33 4000 - Storm Drainage Utilities

"All rights reserved. This Project Manual or any part hereof may not be duplicated without the written consent of Rainforth Grau Architects except in the form of excerpts or quotations for the purpose of review."

SUMMARY OF WORK

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Site Access Conditions and Requirements;
- B. Special Conditions.

1.02 SUMMARY OF WORK COVERED BY CONTRACT DOCUMENTS

- A. The Work of this Contract consists of the following at Poet-Christian Elementary School:
 - (1) Selective demolition and construction for preparation of the site to receive 1 - 36'x40' relocatable building, including associated civil, architectural and electrical work as indicated in the drawings.

1.03 CONTRACTS

- A. Perform the Work under a single, fixed-price Contract.

1.04 WORK BY OTHERS

- A. Construction of 1 - 36'x40' classroom building by portable manufacturer

1.05 CODES, REGULATIONS, AND STANDARDS

- A. The codes, regulations, and standards adopted by the state and federal agencies having jurisdiction shall govern minimum requirements for this Project. Where codes, regulations, and standards conflict with the Contract Documents, these conflicts shall be brought to the immediate attention of the District and the Architect.
- B. Codes, regulations, and standards shall be as published effective as of date of bid opening, unless otherwise specified or indicated.

1.06 PROJECT RECORD DOCUMENTS

- A. Contractor shall maintain on Site one set of the following record documents; Contractor shall record actual revisions to the Work:
 - (1) Contract Drawings.
 - (2) Specifications.

- (3) Addenda.
 - (4) Change Orders and other modifications to the Contract.
 - (5) Reviewed shop drawings, product data, and samples.
 - (6) Field test records.
 - (7) Inspection certificates.
 - (8) Manufacturer's certificates.
- B. Contractor shall store Record Documents separate from documents used for construction. Provide files, racks, and secure storage for Record Documents and samples.
 - C. Contractor shall record information concurrent with construction progress.
 - D. Specifications: Contractor shall legibly mark and record at each product section of the Specifications the description of the actual product(s) installed, including the following:
 - (1) Manufacturer's name and product model and number.
 - (2) Product substitutions or alternates utilized.
 - (3) Changes made by Addenda and Change Orders and written directives.

1.07 EXAMINATION OF EXISTING CONDITIONS

- A. Contractor shall be held to have examined the Project Site and acquainted itself with the conditions of the Site and of the streets or roads approaching the Site.
- B. Prior to commencement of Work, Contractor shall survey the Site and existing buildings and improvements to observe existing damage and defects such as cracks, sags, broken, missing or damaged glazing, other building elements and Site improvements, and other damage.
- C. Should Contractor observe cracks, sags, and other damage to and defects of the Site and adjacent buildings, paving, and other items not indicated in the Contract Documents, Contractor shall immediately report same to the District and the Architect.

1.08 CONTRACTOR'S USE OF PREMISES

- A. If unoccupied and only with District's prior written approval, Contractor may use the building(s) at the Project Site without limitation for its operations, storage, and office facilities for the performance of the Work. If the District chooses to beneficially occupy any building(s), Contractor must obtain the District's written approval for Contractor's use of spaces and types of operations to be performed within the building(s) while so occupied. Contractor's access to the building(s) shall be limited to the areas indicated.

- B. If the space at the Project Site is not sufficient for Contractor's operations, storage, office facilities and/or parking, Contractor shall arrange and pay for any additional facilities needed by Contractor.
- C. Contractor shall not interfere with use of or access to occupied portions of the building(s) or adjacent property.
- D. Contractor shall maintain corridors, stairs, halls, and other exit-ways of building clear and free of debris and obstructions at all times.
- E. No one other than those directly involved in the demolition and construction, or specifically designated by the District or the Architect shall be permitted in the areas of work during demolition and construction activities.
- F. The Contractor shall install the construction fence and maintain that it will be locked when not in use. Keys to this fencing will be provided to the District.

1.09 PROTECTION OF EXISTING STRUCTURES AND UTILITIES

- A. The Drawings show above-grade and below-grade structures, utility lines, and other installations that are known or believed to exist in the area of the Work. Contractor shall locate these existing installations before proceeding with excavation and other operations that could damage same; maintain them in service, where appropriate; and repair damage to them caused by the performance of the Work. Should damage occur to these existing installations, the costs of repair shall be at the Contractor's expense and made to the District's satisfaction.
- B. Contractor shall be alert to the possibility of the existence of additional structures and utilities. If Contractor encounters additional structures and utilities, Contractor will immediately report to the District for disposition of same as indicated in the General Conditions.

1.10 UTILITY SHUTDOWNS AND INTERRUPTIONS

- A. Contractor shall give the District a minimum of three (3) days written notice in advance of any need to shut off existing utility services or to effect equipment interruptions. The District will set exact time and duration for shutdown, and will assist Contractor with shutdown. Work required to re-establish utility services shall be performed by the Contractor.
- B. Contractor shall obtain District's written approval as indicated in the General Conditions in advance of deliveries of material or equipment or other activities that may conflict with District's use of the building(s) or adjacent facilities.

1.11 STRUCTURAL INTEGRITY

- A. Contractor shall be responsible for and supervise each operation and work that could affect structural integrity of various building elements, both permanent and temporary.
- B. Contractor shall include structural connections and fastenings as indicated or required for complete performance of the Work.

PART 2 – PRODUCTS Not Used.

PART 3 – EXECUTION Not Used.

END OF DOCUMENT

PRODUCT OPTIONS AND SUBSTITUTIONS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. Instructions to Bidders;
- B. General Conditions, including, without limitation, Substitutions For Specified Items; and
- C. Special Conditions.

1.02 SUBSTITUTIONS OF MATERIALS AND EQUIPMENT

- A. Catalog numbers and specific brands or trade names followed by the designation "or equal" are used in conjunction with material and equipment required by the Specifications to establish the standards of quality, utility, and appearance required. Substitutions which are equal in quality, utility, and appearance to those specified may be reviewed subject to the provisions of the General Conditions.
- B. Wherever more than one manufacturer's product is specified, the first-named product is the basis for the design used in the work and the use of alternative-named manufacturers' products or substitutes may require modifications in that design. If such alternatives are proposed by Contractor and are approved by the District and/or the Architect, Contractor shall assume all costs required to make necessary revisions and modifications of the design resulting from the substitutions requested by the Contractor.
- C. When materials and equipment are specified by first manufacturer's name and product number, second manufacturer's name and "or approved equal," supporting data for the second product, if proposed by Contractor, shall be submitted in accordance with the requirements for substitutions. The District's Board has found and determined that certain item(s) shall be used on this Project based on the purpose(s) indicated pursuant to Public Contract Code section 3400(c). These findings, as well as the products and brand or trade names, have been identified in the Notice to Bidders.
- D. The Contractor will not be allowed to substitute specified items unless the request for substitution is submitted as follows:
 - (1) District must receive any notice of request for substitution of a specified item a minimum of ten (10) calendar days prior to bid opening.

- (2) Within 35 days after the date of the Notice of Award, the Contractor shall submit data substantiating the request(s) for all substitution(s) containing sufficient information to assess acceptability of product or system and impact on Project, including, without limitation, the requirements specified in the Special Conditions and the technical Specifications. Insufficient information shall be grounds for rejection of substitution.
- E. If the District and/or Architect, in reviewing proposed substitute materials and equipment, require revisions or corrections to be made to previously accepted Shop Drawings and supplemental supporting data to be resubmitted, Contractor shall promptly do so. If any proposed substitution is judged by the District and/or Architect to be unacceptable, the specified material or equipment shall be provided.
- F. Samples may be required. Tests required by the District and/or Architect for the determination of quality and utility shall be made at the expense of Contractor, with acceptance of the test procedure first given by the District.
- G. In reviewing the supporting data submitted for substitutions, the District and/or Architect will use for purposes of comparison all the characteristics of the specified material or equipment as they appear in the manufacturer's published data even though all the characteristics may not have been particularly mentioned in the Contract Documents. If more than two (2) submissions of supporting data are required, the cost of reviewing the additional supporting data shall be borne by Contractor, and the District will deduct the costs from the Contract Price. The Contractor shall be responsible for any re-design costs occasioned by District's acceptance and/or approval of any substitute.
- H. The Contractor shall, in the event that a substitute is less costly than that specified, credit the District with one hundred percent (100%) of the net difference between the substitute and the originally specified material. In this event, the Contractor agrees to execute a deductive Change Order to reflect that credit. In the event Contractor furnishes a material, process, or article more expensive than that specified, the difference in the cost of that material, process, or article so furnished shall be borne by Contractor.
- I. In no event shall the District be liable for any increase in Contract Price or Contract Time due to any claimed delay in the evaluation of any proposed substitute or in the acceptance or rejection of any proposed substitute.

PART 2 – PRODUCTS Not Used.

PART 3 – EXECUTION Not Used.

END OF DOCUMENT

DOCUMENT 01 26 00

CHANGES IN THE WORK

CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE PROVISIONS IN THE AGREEMENT, GENERAL CONDITIONS, AND SPECIAL CONDITIONS, IF USED, RELATED TO CHANGES AND/OR REQUESTS FOR CHANGES.

END OF DOCUMENT

DOCUMENT 01 29 00

**APPLICATION FOR PAYMENT AND
CONDITIONAL AND UNCONDITIONAL WAIVER AND RELEASE FORMS**

**CONTRACTOR SHALL COMPLY WITH ALL PROVISIONS IN THE GENERAL
CONDITIONS RELATED TO APPLICATIONS FOR PAYMENT AND/OR PAYMENTS.**

**CONDITIONAL WAIVER AND RELEASE
ON PROGRESS PAYMENT
(CIVIL CODE SECTION 8132)**

NOTICE: THIS DOCUMENT WAIVES THE CLAIMANT'S LIEN, STOP PAYMENT NOTICE, AND PAYMENT BOND RIGHTS EFFECTIVE ON RECEIPT OF PAYMENT. A PERSON SHOULD NOT RELY ON THIS DOCUMENT UNLESS SATISFIED THAT THE CLAIMANT HAS RECEIVED PAYMENT.

Name of Claimant: _____

Name of Customer: _____

Job Location: _____

Owner: _____

Through Date: _____

Conditional Waiver and Release

This document waives and releases lien, stop payment notice, and payment bond rights the claimant has for labor and service provided, and equipment and material delivered, to the customer on this job through the Through Date of this document. Rights based upon labor or service provided, or equipment or material delivered, pursuant to a written change order that has been fully executed by the parties prior to the date that this document is signed by the claimant, are waived and released by this document, unless listed as an Exception below. This document is effective only on the claimant's receipt of payment from the financial institution on which the following check is drawn:

Maker of Check: _____

Amount of Check: \$_____

Check Payable to: _____

Exceptions

This document does not affect any of the following:

- (1) Retentions.
- (2) Extras for which the claimant has not received payment.
- (3) The following progress payments for which the claimant has previously given a conditional waiver and release but has not received payment:

Date(s) of waiver and release: _____

Amount(s) of unpaid progress payment(s): \$_____

TRACY UNIFIED SCHOOL DISTRICT

**APPLICATION FOR PAYMENT AND
CONDITIONAL AND UNCONDITIONAL
WAIVER AND RELEASE FORMS
DOCUMENT 01 29 00-2**

- (4) Contract rights, including (A) a right based on rescission, abandonment, or breach of contract, and (B) the right to recover compensation for work not compensated by the payment.

Claimant's Signature: _____

Claimant's Title: _____

Date of Signature: _____

**UNCONDITIONAL WAIVER AND RELEASE
ON PROGRESS PAYMENT
(CIVIL CODE SECTION 8134)**

NOTICE TO CLAIMANT: THIS DOCUMENT WAIVES AND RELEASES LIEN, STOP PAYMENT NOTICE, AND PAYMENT BOND RIGHTS UNCONDITIONALLY AND STATES THAT YOU HAVE BEEN PAID FOR GIVING UP THOSE RIGHTS. THIS DOCUMENT IS ENFORCEABLE AGAINST YOU IF YOU SIGN IT, EVEN IF YOU HAVE NOT BEEN PAID. IF YOU HAVE NOT BEEN PAID, USE A CONDITIONAL WAIVER AND RELEASE FORM.

Name of Claimant: _____

Name of Customer: _____

Job Location: _____

Owner: _____

Through Date: _____

Unconditional Waiver and Release

This document waives and releases lien, stop payment notice, and payment bond rights the claimant has for labor and service provided, and equipment and material delivered, to the customer on this job through the Through Date of this document. Rights based upon labor or service provided, or equipment or material delivered, pursuant to a written change order that has been fully executed by the parties prior to the date that this document is signed by the claimant, are waived and released by this document, unless listed as an Exception below. The claimant has received the following progress payment: \$_____

Exceptions

This document does not affect any of the following:

- (1) Retentions.
- (2) Extras for which the claimant has not received payment.
- (3) Contract rights, including (A) a right based on rescission, abandonment, or breach of contract, and (B) the right to recover compensation for work not compensated by the payment.

Claimant's Signature: _____

Claimant's Title: _____

Date of Signature: _____

**CONDITIONAL WAIVER AND RELEASE
ON FINAL PAYMENT**
(CIVIL CODE SECTION 8136)

NOTICE: THIS DOCUMENT WAIVES THE CLAIMANT'S LIEN, STOP PAYMENT NOTICE, AND PAYMENT BOND RIGHTS EFFECTIVE ON RECEIPT OF PAYMENT. A PERSON SHOULD NOT RELY ON THIS DOCUMENT UNLESS SATISFIED THAT THE CLAIMANT HAS RECEIVED PAYMENT.

Name of Claimant: _____

Name of Customer: _____

Job Location: _____

Owner: _____

Conditional Waiver and Release

This document waives and releases lien, stop payment notice, and payment bond rights the claimant has for labor and service provided, and equipment and material delivered, to the customer on this job. Rights based upon labor or service provided, or equipment or material delivered, pursuant to a written change order that has been fully executed by the parties prior to the date that this document is signed by the claimant, are waived and released by this document, unless listed as an Exception below. This document is effective only on the claimant's receipt of payment from the financial institution on which the following check is drawn:

Maker of Check:

Amount of Check: \$_____

Check Payable to: _____

Exceptions

This document does not affect any of the following: _____

Disputed claims for extras in the amount of: \$_____

Claimant's Signature: _____

Claimant's Title: _____

Date of Signature: _____

**UNCONDITIONAL WAIVER AND RELEASE
ON FINAL PAYMENT**
(CIVIL CODE SECTION 8138)

NOTICE TO CLAIMANT: THIS DOCUMENT WAIVES AND RELEASES LIEN, STOP PAYMENT NOTICE, AND PAYMENT BOND RIGHTS UNCONDITIONALLY AND STATES THAT YOU HAVE BEEN PAID FOR GIVING UP THOSE RIGHTS. THIS DOCUMENT IS ENFORCEABLE AGAINST YOU IF YOU SIGN IT, EVEN IF YOU HAVE NOT BEEN PAID. IF YOU HAVE NOT BEEN PAID, USE A CONDITIONAL WAIVER AND RELEASE FORM.

Name of Claimant: _____

Name of Customer: _____

Job Location: _____

Owner: _____

Unconditional Waiver and Release

This document waives and releases lien, stop payment notice, and payment bond rights the claimant has for all labor and service provided, and equipment and material delivered, to the customer on this job. Rights based upon labor or service provided, or equipment or material delivered, pursuant to a written change order that has been fully executed by the parties prior to the date that this document is signed by the claimant, are waived and released by this document, unless listed as an Exception below. The claimant has been paid in full.

Exceptions

This document does not affect any of the following: _____

Disputed claims for extras in the amount of: \$_____

Claimant's Signature: _____

Claimant's Title: _____

Date of Signature: _____

PROJECT MEETINGS

PART 1 – GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions; and
- B. Special Conditions.

1.02 PROGRESS MEETINGS:

- A. Contractor shall schedule and hold regular weekly progress meetings after a minimum of one week's prior written notice of the meeting date and time to all Invitees as indicated below.
- B. Location: Contractor's field office.
- C. The Contractor shall notify and invite the following entities ("Invitees"):
 - (1) District Representative.
 - (2) Contractor.
 - (3) Contractor's Project Manager.
 - (4) Contractor's Superintendent.
 - (5) Subcontractors, as appropriate to the agenda of the meeting.
 - (6) Suppliers, as appropriate to the agenda of the meeting.
 - (7) Construction Manager, if any.
 - (8) Architect
 - (9) Engineer(s), if any and as appropriate to the agenda of the meeting.
 - (10) Others, as appropriate to the agenda of the meeting.
- D. The District's and/or the Architect's Consultants will attend at their discretion, in response to the agenda.
- E. The District representative, the Construction Manager, and/or another District Agent shall take and distribute meeting notes to attendees and other concerned parties. If exceptions are taken to anything in the meeting notes,

those exceptions shall be stated in writing to the District within five (5) working days following District's distribution of the meeting notes.

1.03 PRE-INSTALLATION/PERFORMANCE MEETING:

- A. Contractor shall schedule a meeting prior to the start of each of the demolition work phases. Contractor shall invite all Invitees to this meeting, and others whose work may affect or be affected by the quality of the demolition work.
- B. Contractor shall review in detail prior to this meeting, the manufacturer's requirements and specifications, applicable portions of the Contract Documents, Shop Drawings, and other submittals, and other related work. At this meeting, invitees shall review and resolve conflicts, incompatibilities, or inadequacies discovered or anticipated.
- C. Contractor shall review in detail Project conditions, schedule, requirements for performance, application, installation, and quality of completed Work, and protection of adjacent Work and property.
- D. Contractor shall review in detail means of protecting the completed Work during the remainder of the construction period.

PART 2 - PRODUCTS Not Used.

PART 3 - EXECUTION Not Used.

END OF DOCUMENT

SCHEDULING OF WORK

PART 1 – GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions;
- B. Special Conditions;
- C. Summary of Work; and
- D. Submittals.

1.02 SECTION INCLUDES

- A. Scheduling of Work under this Contract shall be performed by Contractor in accordance with requirements of this Section.
 - (1) Development of schedule, cost and resource loading of the schedule, monthly payment requests, and project status reporting requirements of the Contract shall employ computerized Critical Path Method ("CPM") scheduling ("CPM Schedule").
 - (2) CPM Schedule shall be cost loaded based on Schedule of Values as approved by District.
 - (3) Submit schedules and reports as specified in the General Conditions.
- B. Upon Award of Contract, Contractor shall immediately commence development of Initial and Original CPM Schedules to ensure compliance with CPM Schedule submittal requirements.

1.03 CONSTRUCTION SCHEDULE

- A. Within ten (10) days of issuance of the issuance Notice to Proceed and before request for first progress payment, the Contractor shall prepare and submit to the Project Manager a construction progress schedule conforming to the Milestone Schedule below.
- B. The Construction Schedule shall be continuously updated, and an updated schedule shall be submitted with each application for progress payment. Each revised schedule shall indicate the work actually accomplished during the previous period and the schedule for completion of the remaining work.

C. Milestone Schedule:

ACTIVITY DESCRIPTION

REQUIRED COMPLETION

CONSTRUCTION STARTS

05-26-2022

PHASE 1 DEMOLITION

PHASE 2 DEMOLITION

FINAL PROJECT COMPLETION

1.04 QUALIFICATIONS

- A. Contractor shall employ experienced scheduling personnel qualified to use the latest version of [i.e., Primavera Project Planner]. Experience level required is set forth below. Contractor may employ such personnel directly or may employ a consultant for this purpose.
- (1) The written statement shall identify the individual who will perform CPM scheduling.
 - (2) Capability and experience shall be verified by description of construction projects on which individual has successfully applied computerized CPM.
 - (3) Required level of experience shall include at least two (2) projects of similar nature and scope with value not less than three fourths ($\frac{3}{4}$) of the Total Bid Price of this Project. The written statement shall provide contact persons for referenced projects with current telephone and address information.
- B. District reserves the right to approve or reject Contractor's scheduler or consultant at any time. District reserves the right to refuse replacing of Contractor's scheduler or consultant, if District believes replacement will negatively affect the scheduling of Work under this Contract.

1.05 GENERAL

- A. Progress Schedule shall be based on and incorporate milestone and completion dates specified in Contract Documents.
- B. Overall time of completion and time of completion for each milestone shown on Progress Schedule shall adhere to times in the Contract, unless an earlier (advanced) time of completion is requested by Contractor and agreed to by District. Any such agreement shall be formalized by a Change Order.
- (1) District is not required to accept an early completion schedule, i.e., one that shows an earlier completion date than the Contract Time.
 - (2) Contractor shall not be entitled to extra compensation in event agreement is reached on an earlier completion schedule and Contractor completes its Work, for whatever reason, beyond completion date shown in its early completion schedule but within the Contract Time.

- (3) A schedule showing the work completed in less than the Contract Time, and that has been accepted by District, shall be considered to have Project Float. The Project Float is the time between the scheduled completion of the work and the Completion Date. Project Float is a resource available to both District and the Contractor.
- C. Ownership Project Float: Neither the District nor Contractor owns Project Float. The Project owns the Project Float. As such, liability for delay of the Completion Date rests with the party whose actions, last in time, actually cause delay to the Completion Date.
 - (1) For example, if Party A uses some, but not all of the Project Float and Party B later uses remainder of the Project Float as well as additional time beyond the Project Float, Party B shall be liable for the time that represents a delay to the Completion Date.
 - (2) Party A would not be responsible for the time since it did not consume the entire Project Float and additional Project Float remained; therefore, the Completion Date was unaffected by Party A.
- D. Progress Schedule shall be the basis for evaluating job progress, payment requests, and time extension requests. Responsibility for developing Contract CPM Schedule and monitoring actual progress as compared to Progress Schedule rests with Contractor.
- E. Failure of Progress Schedule to include any element of the Work, or any inaccuracy in Progress Schedule, will not relieve Contractor from responsibility for accomplishing the Work in accordance with the Contract. District's acceptance of schedule shall be for its use in monitoring and evaluating job progress, payment requests, and time extension requests and shall not, in any manner, impose a duty of care upon District, or act to relieve Contractor of its responsibility for means and methods of construction.
- F. Software: Use [i.e, District Project Planner for Windows, latest version]. Such software shall be compatible with Windows operating system. Contractor shall transmit contract file to District on compact disk at times requested by District.
- G. Transmit each item under the form approved by District.
 - (1) Identify Project with District Contract number and name of Contractor.
 - (2) Provide space for Contractor's approval stamp and District's review stamps.
 - (3) Submittals received from sources other than Contractor will be returned to the Contractor without District's review.

1.06 INITIAL CPM SCHEDULE

- A. Initial CPM Schedule submitted for review at the pre-construction conference shall serve as Contractor's schedule for up to ninety (90) calendar days after the Notice to Proceed.

- B. Indicate detailed plan for the Work to be completed in first ninety (90) days of the Contract; details of planned mobilization of plant and equipment; sequence of early operations; procurement of materials and equipment. Show Work beyond ninety (90) calendar days in summary form.
- C. Initial CPM Schedule shall be time scaled.
- D. Initial CPM Schedule shall be cost and resource loaded. Accepted cost and resource loaded schedule will be used as basis for monthly progress payments until acceptance of the Original CPM Schedule. Use of Initial CPM Schedule for progress payments shall not exceed ninety (90) calendar days.
- E. District and Contractor shall meet to review and discuss the Initial CPM Schedule within seven (7) calendar days after it has been submitted to District.
 - (1) District's review and comment on the schedule shall be limited to Contract conformance (with sequencing, coordination, and milestone requirements).
 - (2) Contractor shall make corrections to schedule necessary to comply with Contract requirements and shall adjust schedule to incorporate any missing information requested by District. Contractor shall resubmit Initial CPM Schedule if requested by District.
- F. If, during the first ninety (90) days after Notice to Proceed, the Contractor is of the opinion that any of the Work included on its Initial CPM Schedule has been impacted, the Contractor shall submit to District a written Time Impact Evaluation ("TIE") in accordance with Article 1.12 of this Section. The TIE shall be based on the most current update of the Initial CPM Schedule.

1.07 ORIGINAL CPM SCHEDULE

- A. Submit a detailed proposed Original CPM Schedule presenting an orderly and realistic plan for completion of the Work in conformance with requirements as specified herein.
- B. Progress Schedule shall include or comply with following requirements:
 - (1) Time scaled, cost and resource (labor and major equipment) loaded CPM schedule.
 - (2) No activity on schedule shall have duration longer than fifteen (15) work days, with exception of submittal, approval, fabrication and procurement activities, unless otherwise approved by District.
 - (a) Activity durations shall be total number of actual work days required to perform that activity.
 - (3) The start and completion dates of all items of Work, their major components, and milestone completion dates, if any.

- (4) District furnished materials and equipment, if any, identified as separate activities.
- (5) Activities for maintaining Project Record Documents.
- (6) Dependencies (or relationships) between activities.
- (7) Processing/approval of submittals and shop drawings for all material and equipment required per the Contract. Activities that are dependent on submittal acceptance or material delivery shall not be scheduled to start earlier than expected acceptance or delivery dates.
 - (a) Include time for submittals, re-submittals and reviews by District. Coordinate with accepted schedule for submission of Shop Drawings, samples, and other submittals.
 - (b) Contractor shall be responsible for all impacts resulting from re-submittal of Shop Drawings and submittals.
- (8) Procurement of major equipment, through receipt and inspection at jobsite, identified as separate activity.
 - (a) Include time for fabrication and delivery of manufactured products for the Work.
 - (b) Show dependencies between procurement and construction.
- (9) Activity description; what Work is to be accomplished and where.
- (10) The total cost of performing each activity shall be total of labor, material, and equipment, excluding overhead and profit of Contractor. Overhead and profit of the General Contractor shall be shown as a separate activity in the schedule. Sum of cost for all activities shall equal total Contract value.
- (11) Resources required (labor and major equipment) to perform each activity.
- (12) Responsibility code for each activity corresponding to Contractor or Subcontractor responsible for performing the Work.
- (13) Identify the activities which constitute the controlling operations or critical path. No more than twenty-five (25%) of the activities shall be critical or near critical. Near critical is defined as float in the range of one (1) to (10) days.
- (14) Twenty (20) workdays for developing punch list(s), completion of punch-list items, and final clean up for the Work or any designated portion thereof. No other activities shall be scheduled during this period.
- (15) Interface with the work of other contractors, District, and agencies such as, but not limited to, utility companies.

- (16) Show detailed Subcontractor Work activities. In addition, furnish copies of Subcontractor schedules upon which CPM was built.
 - (a) Also furnish for each Subcontractor, as determined by District, submitted on Subcontractor letterhead, a statement certifying that Subcontractor concurs with Contractor's Original CPM Schedule and that Subcontractor's related schedules have been incorporated, including activity duration, cost and resource loading.
 - (b) Subcontractor schedules shall be independently derived and not a copy of Contractor's schedule.
 - (c) In addition to Contractor's schedule and resource loading, obtain from electrical, mechanical, and plumbing Subcontractors, and other Subcontractors as required by District, productivity calculations common to their trades, such as units per person day, feet of pipe per day per person, feet of wiring per day per person, and similar information.
 - (d) Furnish schedule for Contractor/Subcontractor CPM schedule meetings which shall be held prior to submission of Original CPM schedule to District. District shall be permitted to attend scheduled meetings as an observer.
- (17) Activity durations shall be in Work days.
- (18) Submit with the schedule a list of anticipated non-Work days, such as weekends and holidays. The Progress Schedule shall exclude in its Work day calendar all non-Work days on which Contractor anticipates critical Work will not be performed.
- C. Original CPM Schedule Review Meeting: Contractor shall, within sixty (60) days from the Notice to Proceed date, meet with District to review the Original CPM Schedule submittal.
 - (1) Contractor shall have its Project Manager, Project Superintendent, Project Scheduler, and key Subcontractor representatives, as required by District, in attendance. The meeting will take place over a continuous one (1) day period.
 - (2) District's review will be limited to submittal's conformance to Contract requirements including, but not limited to, coordination requirements. However, review may also include:
 - (a) Clarifications of Contract Requirements.
 - (b) Directions to include activities and information missing from submittal.
 - (c) Requests to Contractor to clarify its schedule.

- (3) Within five (5) days of the Schedule Review Meeting, Contractor shall respond in writing to all questions and comments expressed by District at the Meeting.

1.08 ADJUSTMENTS TO CPM SCHEDULE

- A. Adjustments to Original CPM Schedule: Contractor shall have adjusted the Original CPM Schedule submittal to address all review comments from original CPM Schedule review meeting and resubmit network diagrams and reports for District's review.
 - (1) District, within ten (10) days from date that Contractor submitted the revised schedule, will either:
 - (a) Accept schedule and cost and resource loaded activities as submitted, or
 - (b) Advise Contractor in writing to review any part or parts of schedule which either do not meet Contract requirements or are unsatisfactory for District to monitor Project's progress, resources, and status or evaluate monthly payment request by Contractor.
 - (2) District may accept schedule with conditions that the first monthly CPM Schedule update be revised to correct deficiencies identified.
 - (3) When schedule is accepted, it shall be considered the "Original CPM Schedule" which will then be immediately updated to reflect the current status of the work.
 - (4) District reserves right to require Contractor to adjust, add to, or clarify any portion of schedule which may later be discovered to be insufficient for monitoring of Work or approval of partial payment requests. No additional compensation will be provided for such adjustments, additions, or clarifications.
- B. Acceptance of Contractor's schedule by District will be based solely upon schedule's compliance with Contract requirements.
 - (1) By way of Contractor assigning activity durations and proposing sequence of Work, Contractor agrees to utilize sufficient and necessary management and other resources to perform work in accordance with the schedule.
 - (2) Upon submittal of schedule update, updated schedule shall be considered "current" CPM Schedule.
 - (3) Submission of Contractor's schedule to District shall not relieve Contractor of total responsibility for scheduling, sequencing, and pursuing Work to comply with requirements of Contract Documents, including adverse effects such as delays resulting from ill-timed Work.

- C. Submittal of Original CPM Schedule, and subsequent schedule updates, shall be understood to be Contractor's representation that the Schedule meets requirements of Contract Documents and that Work shall be executed in sequence indicated on the schedule.
- D. Contractor shall distribute Original CPM Schedule to Subcontractors for review and written acceptance, which shall be noted on Subcontractors' letterheads to Contractor and transmitted to District for the record.

1.09 MONTHLY CPM SCHEDULE UPDATE SUBMITTALS

- A. Following acceptance of Contractor's Original CPM Schedule, Contractor shall monitor progress of Work and adjust schedule each month to reflect actual progress and any anticipated changes to planned activities.
 - (1) Each schedule update submitted shall be complete, including all information requested for the Original CPM Schedule submittal.
 - (2) Each update shall continue to show all Work activities including those already completed. These completed activities shall accurately reflect "as built" information by indicating when activities were actually started and completed.
- B. A meeting will be held on approximately the twenty-fifth (25th) of each month to review the schedule update submittal and progress payment application.
 - (1) At this meeting, at a minimum, the following items will be reviewed: Percent (%) complete of each activity; Time Impact Evaluations for Change Orders and Time Extension Request; actual and anticipated activity sequence changes; actual and anticipated duration changes; and actual and anticipated Contractor delays.
 - (2) These meetings are considered a critical component of overall monthly schedule update submittal and Contractor shall have appropriate personnel attend. At a minimum, these meetings shall be attended by Contractor's General Superintendent and Scheduler.
 - (3) Contractor shall plan on the meeting taking no less than four (4) hours.
- C. Within five (5) working days after monthly schedule update meeting, Contractor shall submit the updated CPM Schedule update.
- D. Within five (5) work days of receipt of above noted revised submittals, District will either accept or reject monthly schedule update submittal.
 - (1) If accepted, percent (%) complete shown in monthly update will be basis for Application for Payment by the Contractor. The schedule update shall be submitted as part of the Contractor's Application for Payment.

- (2) If rejected, update shall be corrected and resubmitted by Contractor before the Application for Payment is submitted.
- E. Neither updating, changing or revising of any report, curve, schedule, or narrative submitted to District by Contractor under this Contract, nor District's review or acceptance of any such report, curve, schedule or narrative shall have the effect of amending or modifying in any way the Completion Date or milestone dates or of modifying or limiting in any way Contractor's obligations under this Contract.

1.10 SCHEDULE REVISIONS

- A. Updating the Schedule to reflect actual progress shall not be considered revisions to the Schedule. Since scheduling is a dynamic process, revisions to activity durations and sequences are expected on a monthly basis.
- B. To reflect revisions to the Schedule, the Contractor shall provide District with a written narrative with a full description and reasons for each Work activity revised. For revisions affecting the sequence of work, the Contractor shall provide a schedule diagram which compares the original sequence to the revised sequence of work. The Contractor shall provide the written narrative and schedule diagram for revisions two (2) working days in advance of the monthly schedule update meeting.
- C. Schedule revisions shall not be incorporated into any schedule update until the revisions have been reviewed by District. District may request further information and justification for schedule revisions and Contractor shall, within three (3) days, provide District with a complete written narrative response to District's request.
- D. If the Contractor's revision is still not accepted by District, and the Contractor disagrees with District's position, the Contractor has seven (7) calendar days from receipt of District's letter rejecting the revision to provide a written narrative providing full justification and explanation for the revision. The Contractor's failure to respond in writing within seven (7) calendar days of District's written rejection of a schedule revision shall be contractually interpreted as acceptance of District's position, and the Contractor waives its rights to subsequently dispute or file a claim regarding District's position.
- E. At District's discretion, the Contractor can be required to provide Subcontractor certifications of performance regarding proposed schedule revisions affecting said Subcontractors.

1.11 RECOVERY SCHEDULE

- A. If the Schedule Update shows a completion date twenty-one (21) calendar days beyond the Contract Completion Date, or individual milestone completion dates, the Contractor shall submit to District the proposed revisions to recover the lost time within seven (7) calendar days. As part of this submittal, the Contractor shall provide a written narrative for each revision made to recapture the lost time. If the revisions include sequence changes, the Contractor shall provide a schedule diagram comparing the original sequence to the revised sequence of work.

- B. The revisions shall not be incorporated into any schedule update until the revisions have been reviewed by District.
- C. If the Contractor's revisions are not accepted by District, District and the Contractor shall follow the procedures in paragraph 1.09.C, 1.09.D and 1.09.E above.
- D. At District's discretion, the Contractor can be required to provide Subcontractor certifications for revisions affecting said Subcontractors.

1.12 TIME IMPACT EVALUATION ("TIE") FOR CHANGE ORDERS, AND OTHER DELAYS

- A. When Contractor is directed to proceed with changed Work, the Contractor shall prepare and submit within fourteen (14) calendar days from the Notice to Proceed a TIE which includes both a written narrative and a schedule diagram depicting how the changed Work affects other schedule activities. The schedule diagram shall show how the Contractor proposes to incorporate the changed Work in the schedule and how it impacts the current schedule-update critical path. The Contractor is also responsible for requesting time extensions based on the TIE's impact on the critical path. The diagram must be tied to the main sequence of schedule activities to enable District to evaluate the impact of changed Work to the scheduled critical path.
- B. Contractor shall be required to comply with the requirements of Paragraph 1.09.A for all types of delays such as, but not limited to, Contractor/Subcontractor delays, adverse weather delays, strikes, procurement delays, fabrication delays, etc.
- C. Contractor shall be responsible for all costs associated with the preparation of TIEs, and the process of incorporating them into the current schedule update. The Contractor shall provide District with four (4) copies of each TIE.
- D. Once agreement has been reached on a TIE, the Contract Time will be adjusted accordingly. If agreement is not reached on a TIE, the Contract Time may be extended in an amount District allows, and the Contractor may submit a claim for additional time claimed by contractor.

1.13 TIME EXTENSIONS

- A. The Contractor is responsible for requesting time extensions for time impacts that, in the opinion of the Contractor, impact the critical path of the current schedule update. Notice of time impacts shall be given in accord with the General Conditions.
- B. Where an event for which District is responsible impacts the projected Completion Date, the Contractor shall provide a written mitigation plan, including a schedule diagram, which explains how (e.g., increase crew size, overtime, etc.) the impact can be mitigated. The Contractor shall also include a detailed cost breakdown of the labor, equipment, and material the Contractor would expend to mitigate District-caused time impact. The Contractor shall submit its mitigation plan to District within fourteen (14)

calendar days from the date of discovery of the impact. The Contractor is responsible for the cost to prepare the mitigation plan.

- C. Failure to request time, provide TIE, or provide the required mitigation plan will result in Contractor waiving its right to a time extension and cost to mitigate the delay.
- D. No time will be granted under this Contract for cumulative effect of changes.
- E. District will not be obligated to consider any time extension request unless the Contractor complies with the requirements of Contract Documents.
- F. Failure of the Contractor to perform in accordance with the current schedule update shall not be excused by submittal of time extension requests.
- G. If the Contractor does not submit a TIE within the required fourteen (14) calendar days for any issue, it is mutually agreed that the Contractor does not require a time extension for said issue.

1.14 SCHEDULE REPORTS

- A. Submit four (4) copies of the following reports with the Initial CPM Schedule, the Original CPM Schedule, and each monthly update.
- B. Required Reports:
 - (1) Two activity listing reports: one sorted by activity number and one by total Project Float. These reports shall also include each activity's early/late and actual start and finish dates, original and remaining duration, Project Float, responsibility code, and the logic relationship of activities.
 - (2) Cost report sorted by activity number including each activity's associated cost, percentage of Work accomplished, earned value- to date, previous payments, and amount earned for current update period.
 - (3) Schedule plots presenting time-scaled network diagram showing activities and their relationships with the controlling operations or critical path clearly highlighted.
 - (4) Cash flow report calculated by early start, late start, and indicating actual progress. Provide an exhibit depicting this information in graphic form.
 - (5) Planned versus actual resource (i.e., labor) histogram calculated by early start and late start.
- C. Other Reports:

In addition to above reports, District may request, from month to month, any two of the following reports. Submit four (4) copies of all reports.

- (1) Activities by early start.
 - (2) Activities by late start.
 - (3) Activities grouped by Subcontractors or selected trades.
 - (4) Activities with scheduled early start dates in a given time frame, such as fifteen (15) or thirty (30) day outlook.
- D. Furnish District with report files on compact disks containing all schedule files for each report generated.

1.15 PROJECT STATUS REPORTING

- A. In addition to submittal requirements for CPM scheduling identified in this Section, Contractor shall provide a monthly project status report (i.e., written narrative report) to be submitted in conjunction with each CPM Schedule as specified herein. Status reporting shall be in form specified below.
- B. Contractor shall prepare monthly written narrative reports of status of Project for submission to District. Written status reports shall include:
- (1) Status of major Project components (percent (%) complete, amount of time ahead or behind schedule) and an explanation of how Project will be brought back on schedule if delays have occurred.
 - (2) Progress made on critical activities indicated on CPM Schedule.
 - (3) Explanations for any lack of work on critical path activities planned to be performed during last month.
 - (4) Explanations for any schedule changes, including changes to logic or to activity durations.
 - (5) List of critical activities scheduled to be performed next month.
 - (6) Status of major material and equipment procurement.
 - (7) Any delays encountered during reporting period.
 - (8) Contractor shall provide printed report indicating actual versus planned resource loading for each trade and each activity. This report shall be provided on weekly and monthly basis.
 - (a) Actual resource shall be accumulated in field by Contractor, and shall be as noted on Contractor's daily reports. These reports will be basis for information provided in computer-generated monthly and weekly printed reports.
 - (b) Contractor shall explain all variances and mitigation measures.

- (9) Contractor may include any other information pertinent to status of Project. Contractor shall include additional status information requested by District at no additional cost.
- (10) Status reports, and the information contained therein, shall not be construed as claims, notice of claims, notice of delay, or requests for changes or compensation.

1.16 WEEKLY SCHEDULE REPORT

At the Weekly Progress Meeting, the Contractor shall provide and present a time-scaled three (3) week look-ahead schedule that is based and correlated by activity number to the current schedule (i.e., Initial, Original CPM, or Schedule Update).

1.17 DAILY CONSTRUCTION REPORTS

On a daily basis, Contractor shall submit a daily activity report to District for each workday, including weekends and holidays when worked. Contractor shall develop the daily construction reports on a computer-generated database capable of sorting daily Work, manpower, and man-hours by Contractor, Subcontractor, area, sub-area, and Change Order Work. Upon request of District, furnish computer disk of this data base. Obtain District's written approval of daily construction report data base format prior to implementation. Include in report:

- A. Project name and Project number.
- B. Contractor's name and address.
- C. Weather, temperature, and any unusual site conditions.
- D. Brief description and location of the day's scheduled activities and any special problems and accidents, including Work of Subcontractors. Descriptions shall be referenced to CPM scheduled activities.
- E. Worker quantities for its own Work force and for Subcontractors of any tier.
- F. Equipment, other than hand tools, utilized by Contractor and Subcontractors.

1.18 PERIODIC VERIFIED REPORTS

Contractor shall complete and verify construction reports on a form prescribed by the Division of the State Architect and file reports on the first day of February, May, August, and November during the preceding quarter year; at the completion of the Contract; at the completion of the Work; at the suspension of Work for a period of more than one (1) month; whenever the services of Contractor or any of Contractor's Subcontractors are terminated for any reason; and at any time a special verified report is required by the Division of the State Architect. Refer to section 4-336 and section 4-343 of Part 1, Title 24 of the California Code of Regulations.

PART 2 – PRODUCTS Not Used.

PART 3 - EXECUTION Not Used.

END OF DOCUMENT

SUBMITTALS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Contractor's Submittals and Schedules, Drawings and Specifications;
- B. Special Conditions.

1.02 SECTION INCLUDES:

- A. Definitions:
 - (1) Shop Drawings and Product Data are as indicated in the General Conditions and include, but are not limited to, fabrication, erection, layout and setting drawings, formwork and falsework drawings, manufacturers' standard drawings, descriptive literature, catalogues, brochures, performance and test data, wiring and control diagrams. In addition, there are other drawings and descriptive data pertaining to materials, equipment, piping, duct and conduit systems, and methods of construction as may be required to show that the materials, equipment or systems and all positions conform to the requirement of the Contract Documents, including, without limitation, the Drawings.
 - (2) "Manufactured" applies to standard units usually mass-produced; "fabricated" means specifically assembled or made out of selected materials to meet design requirements. Shop Drawings shall establish the actual detail of manufactured or fabricated items, indicated proper relation to adjoining work and amplify design details of mechanical and electrical equipment in proper relation to physical spaces in the structure.
 - (3) Manufacturer's Instructions: Where any item of Work is required by the Contract Documents to be furnished, installed, or performed, at a minimum, in accordance with a specified product manufacturer's instructions, the Contractor shall procure and distribute copies of these to the District, the Architect, and all other concerned parties and shall furnish, install, or perform the work, at a minimum, in accordance with those instructions.
- B. Samples, Shop Drawings, Product Data, and other items as specified, in accordance with the following requirements:
 - (1) Contractor shall submit all Shop Drawings, Product Data, and Samples to the District, the Architect, the Project Inspector, and the Construction Manager.

Contractor to review section
01 3300 as well as this
document

- (2) Contractor shall comply with all time frames herein and in the General Conditions and, in any case, shall submit required information in sufficient time to permit proper consideration and action before ordering any materials or items represented by such Shop Drawings, Product Data, and/or Samples.
- (3) Contractor shall allow sufficient time so that no delay occurs due to required lead time in ordering or delivery of any item to the Site. Contractor shall be responsible for any delay in progress of Work due to its failure to observe these requirements.
- (4) Time for completion of Work shall not be extended on account of Contractor's failure to promptly submit Shop Drawings, Product Data, and/or Samples.
- (5) Reference numbers on Shop Drawings shall have Architectural and/or Engineering Contract Drawings reference numbers for details, sections, and "cuts" shown on Shop Drawings. These reference numbers shall be in addition to any numbering system that Contractor chooses to use or has adopted as standard.
- (6) When the magnitude or complexity of submittal material prevents a complete review within the stated time frame, Contractor shall make this submittal in increments to avoid extended delays.
- (7) Contractor shall certify on submittals for review that submittals conform to Contract requirements. Also certify that Contractor-furnished equipment can be installed in allocated space. In event of any variance, Contractor shall specifically state in transmittal and on Shop Drawings, portions vary and require approval of a substitute. Submittals shall not be used as a means of requesting a substitution.
- (8) Unless specified otherwise, sampling, preparation of samples, and tests shall be in accordance with the latest standard of the American Society for Testing and Materials.
- (9) Upon demand by Architect or District, Contractor shall submit samples of materials and/or articles for tests or examinations and consideration before Contractor incorporates same in Work. Contractor shall be solely responsible for delays due to sample(s) not being submitted in time to allow for tests. Acceptance or rejection will be expressed in writing. Work shall be equal to approved samples in every respect. Samples that are of value after testing will remain the property of Contractor.

C. Submittal Schedule:

- (1) Contractor shall prepare its proposed submittal schedule that is coordinated with the proposed construction schedule and submit both to the District within ten (10) days after the date of the Notice to Proceed. Contractor's proposed schedules shall become the Project Construction Schedule and the Project Submittal Schedule after each is approved by the District.

Contractor to review section
01 3300 as well as this
document

- (2) Contractor is responsible for all lost time should the initial submittal be rejected, marked "revise and resubmit", etc.
- (3) All Submittals shall be forwarded to the District by the date indicated on the approved Submittal Schedule, unless an earlier date is necessary to maintain the Construction Schedule, in which case those Submittals shall be forwarded to the District so as not to delay the Construction Schedule.
- (4) Contractor may be assessed \$100 a day for each day it is late in submitting a shop drawing or sample. No extensions of time will be granted to Trade Contractor or any Subcontractor because of its failure to have shop drawings and samples submitted in accordance with the Schedule.

1.03 SHOP DRAWINGS:

- A. Contractor shall submit one reproducible transparency and six (6) opaque reproductions. The District will review and return the reproducible copy and one (1) opaque reproduction to Contractor.
- B. Before commencing installation of any Work, the Contractor shall submit and receive approval of all drawings, descriptive data, and material list(s) as required to accomplish Work.
- C. Review of Shop Drawings is regarded as a service to assist Contractor and in all cases original Contract Documents shall take precedence as outlined under General Conditions.
- D. No claim for extra time or payment shall be based on work shown on Shop Drawings unless the claim is (1) noted on Contractor's transmittal letter accompanying Shop Drawings and (2) Contractor has complied with all applicable provisions of the General Conditions, including, without limitation, provisions regarding changes and payment, and all required written approvals.
- E. District shall not review Shop Drawings for quantities of materials or number of items supplied.
- F. District's and/or Architect's review of Shop Drawing will be general. District and/or Architect review does not relieve Contractor of responsibility for dimensions, accuracy, proper fitting, construction of Work, furnishing of materials, or Work required by Contract Documents and not indicated on Shop Drawings. The District's and/or Architect's review of Shop Drawings is not to be construed as approving departures from Contract Documents.
- G. Review of Shop Drawings and Schedules does not relieve Contractor from responsibility for any aspect of those Drawings or Schedules that is a violation of local, County, State, or Federal laws, rules, ordinances, or rules and regulations of commissions, boards, or other authorities or utilities having jurisdiction.
- H. Before submitting Shop Drawings for review, Contractor shall check Shop Drawings of its subcontractors for accuracy, and confirm that all Work

Contractor to review section
01 3300 as well as this
document

contiguous with and having bearing on other work shown on Shop Drawings is accurately drawn and in conformance with Contract Documents.

- I. Submitted drawings and details must bear stamp of approval of Contractor:
 - (1) Stamp and signature shall clearly certify that Contractor has checked Shop Drawings for compliance with Drawings.
 - (2) If Contractor submits a Shop Drawing without an executed stamp of approval, or whenever it is evident (despite stamp) that Drawings have not been checked, the District and/or Architect will not consider them and will return them to the Contractor for revision and resubmission. In that event, it will be deemed that Contractor has not complied with this provision and Contractor shall bear risk of all delays to same extent as if it had not submitted any Shop Drawings or details.
- J. Submission of Shop Drawings (in either original submission or when resubmitted with correction) constitutes evidence that Contractor has checked all information thereon and that it accepts and is willing to perform Work as shown.
- K. Contractor shall pay for cost of any changes in construction due to improper checking and coordination. Contractor shall be responsible for all additional costs, including coordination. Contractor shall be responsible for costs incurred by itself, the District, the Architect, the Project Inspector, the Construction Manager, any other Subcontractor or contractor, etc., due to improperly checked and/or coordination of submittals.
- L. Shop Drawings must clearly delineate the following information:
 - (1) Project name and address.
 - (2) Specification number and description.
 - (3) Architect's name and project number.
 - (4) Shop Drawing title, number, date, and scale.
 - (5) Names of Contractor, Subcontractor(s) and fabricator.
 - (6) Working and erection dimensions.
 - (7) Arrangements and sectional views.
 - (8) Necessary details, including complete information for making connections with other Work.
 - (9) Kinds of materials and finishes.
 - (10) Descriptive names of materials and equipment, classified item numbers, and locations at which materials or equipment are to be installed in the Work. Contractor shall use same reference identification(s) as shown on Contract Drawings.

Contractor to review section
01 3300 as well as this
document

- M. Contractor shall prepare composite drawings and installation layouts when required to solve tight field conditions.
 - (1) Shop Drawings shall consist of dimensioned plans and elevations and must give complete information, particularly as to size and location of sleeves, inserts, attachments, openings, conduits, ducts, boxes, structural interferences, etc.
 - (2) Contractor shall coordinate these composite Shop Drawings and installation layouts in the field between itself and its Subcontractor(s) for proper relationship to the Work, the work of other trades, and the field conditions. The Contractor shall check and approve all submittal(s) before submitting them for final review.

1.04 PRODUCT DATA OR NON REPRODUCIBLE SUBMITTALS:

- A. Contractor shall submit manufacturer's printed literature in original form. Any fading type of reproduction will not be accepted. Contractor must submit a minimum of six (6) each, to the District. District shall return one (1) to the Contractor, who shall reproduce whatever additional copies it requires for distribution.
- B. Contractor shall submit six (6) copies of a complete list of all major items of mechanical, plumbing, and electrical equipment and materials in accordance with the approved Submittal Schedule, except as required earlier to comply with the approved Construction Schedule. Other items specified are to be submitted prior to commencing Work. Contractor shall submit items of like kind at one time in a neat and orderly manner. Partial lists will not be acceptable.
- C. Submittals shall include manufacturer's specifications, physical dimensions, and ratings of all equipment. Contractor shall furnish performance curves for all pumps and fans. Where printed literature describes items in addition to that item being submitted, submitted item shall be clearly marked on sheet and superfluous information shall be crossed out. If highlighting is used, Contractor shall mark all copies.
- D. Equipment submittals shall be complete and include space requirements, weight, electrical and mechanical requirements, performance data, and supplemental information that may be requested.
- E. Imported Materials Certification must be submitted at least ten (10) days before material is delivered.

1.05 SAMPLES:

- A. Contractor shall submit for approval Samples as required and within the time frame in the Contract Documents. Materials such as concrete, mortar, etc., which require on-site testing will be obtained from Project Site.
- B. Contractor shall submit four (4) samples except where greater or lesser number is specifically required by Contract Documents including, without limitation, the Specifications.

Contractor to review section
01 3300 as well as this
document

- (1) Samples must be of sufficient size and quality to clearly illustrate functional characteristics, with integrally related parts and attachment devices.
 - (2) Samples must show full range of texture, color, and pattern.
- C. Contractor shall make all Submittals, unless it has authorized Subcontractor(s) to submit and Contractor has notified the District in writing to this effect.
- D. Samples to be shipped prepaid or hand-delivered to the District.
- E. Contractor shall mark samples to show name of Project, name of Contractor submitting, Contract number and segment of Work where representative Sample will be used, all applicable Specifications Sections and documents, Contract Drawing Number and detail, and ASTM or FS reference, if applicable.
- F. Contractor shall not deliver any material to Site prior to receipt of District's and/or Architect's completed written review and approval. Contractor shall furnish materials equal in every respect to approved Samples and execute Work in conformance therewith.
- G. District's and/or Architect's review, acceptance, and/or approval of Sample(s) will not preclude rejections of any material upon discovery of defects in same prior to final acceptance of completed Work.
- H. After a material has been approved, no change in brand or make will be permitted.
- I. Contractor shall prepare its Submittal Schedule and submit Samples of materials requiring laboratory tests to specified laboratory for testing not less than ninety (90) days before such materials are required to be used in Work.
- J. Samples which are rejected must be resubmitted promptly after notification of rejection and be marked "Resubmitted Sample" in addition to other information required.
- K. Field Samples and Mock-Ups are to be removed by Contractor at District's direction:
 - (1) Size: As Specified.
 - (2) Furnish catalog numbers and similar data, as requested.

1.06 REVIEW AND RESUBMISSION REQUIREMENTS:

- A. The District will arrange for review of Sample(s), Shop Drawing(s), Product Data, and other submittal(s) by appropriate reviewer and return to Contractor as provided below within twenty-one (21) days after receipt or within twenty-one (21) days after receipt of all related information necessary for such review, whichever is later.
- B. One (1) copy of product or materials data will be returned to Contractor with the review status.

Contractor to review section
01 3300 as well as this
document

- C. Samples to be incorporated into the Work will be returned to Contractor, together with a written notice designating the Sample with the appropriate review status and indicating errors discovered on review, if any. Other Samples will not be returned, but the same notice will be given with respect thereto, and that notice shall be considered a return of the Sample.
- D. Contractor shall revise and resubmit any Sample(s), Shop Drawing(s), Product Data, and other submittal(s) as required by the reviewer. Such resubmittals will be reviewed and returned in the same manner as original Sample(s), Shop Drawing(s), Product Data, and other submittal(s), within fourteen (14) days after receipt thereof or within fourteen (14) days after receipt of all related information necessary for such review. Such resubmittal shall not delay the Work.
- E. Contractor may proceed with any of the Work covered by Sample(s), Shop Drawing(s), Product Data, and other submittal(s) upon its return if designated as no exception taken, or revise as noted, provided the Contractor proceeds in accordance with the District and/or the Architect's notes and comments.
- F. Contractor shall not begin any of the work covered by a Sample(s), Shop Drawing(s), Product Data, and other submittal(s), designated as revise and resubmit or rejected, until a revision or correction thereof has been reviewed and returned to Contractor.
- G. Sample(s), Shop Drawing(s), Product Data, and other submittal(s) designated as revise and resubmit or rejected and requiring resubmittal, shall be revised or corrected and resubmitted to the District no later than fourteen (14) days or a shorter period as required to comply with the approved Construction Schedule, after its return to Contractor.
- H. Neither the review nor the lack of review of any Sample(s), Shop Drawing(s), Product Data, and other submittal(s) shall waive any of the requirements of the Contract Documents, or relieve Contractor of any obligation thereunder.
- I. District's and/or Architect's review of Shop Drawings does not relieve the Contractor of responsibility for any errors that may exist. Contractor is responsible for the dimensions and design of adequate connections and details and for satisfactory construction of all the Work.

PART 2 – PRODUCTS Not Used.

PART 3 - EXECUTION Not Used.

END OF DOCUMENT

Poet-Christian E.S. TK Portable Classroom Building **SUBMITTAL NO.:**
Tracy Unified School District

Architect's Project # 3595001

DATE: _____

DSA File/Apl. # 39-73/02-122130

Re-Submittal of Original No.: _____

1. SUBMITTAL TRANSMITTAL

Attention: Affifa Kadhim

Contractor: Company

Contact: Name _____

HMC Architects

Sub Contractor:

Contact: _____

Please submit only one trade per submittal! Description of submitted materials:

Quantity submitted	Specification Section		Description of contents (e.g. product data, shop drawings, samples)
	Section #	Section Title	

Contractor Statement: (read and acknowledge)

This submittal has been reviewed and approved with respect to the means, methods, techniques, and procedures of construction, safety precautions, and program incidentals thereto. This submittal complies with the contract documents and comprises no variations thereto, unless accompanied by a substitution request.

By: _____
Name

Date: _____

2. RE-TRANSMITTAL TO CONTRACTOR:

Distribution: Contractor, Owner, Project Inspector, HMC, Other

- ☐ NO EXCEPTIONS TAKEN
☐ SUBMIT SPECIFIED ITEM

- ☐ REJECTED
☐ REVISE AND RESUBMIT

- ☐ FURNISH AS CORRECTED
☐ NO ACTION REQUIRED

Corrections or comments made on the shop drawings during this review do not relieve the Contractor from compliance with requirements of the Drawings and Specifications. This general check is only for the review of conformance with the design concept of the project and general compliance with the information given in the Contract Documents. The Contractor is responsible for confirming and correlating all quantities and dimensions, selecting fabrication processes and techniques of construction, coordinating his work with that of all the other trades, and performing his work in a safe and satisfactory manner.

HMC Architects

By: _____

Date: _____

Additional Comments:

See Specification Section 01 3300 for use of this form

Architect's Project # 3595001
DSA File/Appl. # 39-73/02-122130

Date: _____

1. SUBSTITUTION REQUEST

Attention: Affifa Kadhim

Contractor: Company _____

Contact: Name _____

HMC Architects

Please submit only one product per request!

Sub Contractor: _____

Include with a specified product Submittal

Contact: _____

2. PROPOSED SUBSTITUTIONS: The undersigned requests consideration of the following substitution:

Specified Item: _____ Page No.: _____ Paragraph No.: _____

Proposed Item: _____

3. REASON FOR REQUEST:

4. REQUIREMENTS FOR SUBSTITUTIONS:

Attached data includes product description, specifications, drawings, photographs, performance and test data adequate for evaluation of request; applicable portions of data are clearly identified. Attached data also includes a description of changes to Contract Documents, which proposed substitution will require for its proper installation.

The undersigned certifies that the following paragraphs, unless modified by attachments, are correct:

1. The proposed substitution does not affect dimensions shown on drawings and does not require design changes in the Contract Documents.
2. The undersigned will pay for changes to the building design, including engineering design, detailing and construction costs caused by the requested substitution.
3. The proposed substitution will have no adverse effect on the work, the schedule or specified warranty requirements.
4. Maintenance and service parts will be readily available for the proposed substitution.

The undersigned further states that the function, appearance and quality of the proposed substitution are equivalent or superior to the specified item.

Signature - Contractor/Subcontractor _____

Date _____

5. TRANSMITTAL TO CONTRACTOR:

Distribution: Contractor, Owner, Project Inspector, HMC, Other

☐ ACCEPTED

☐ ACCEPTED AS NOTED

☐ REJECTED

HMC Architects

By: _____

Date: _____

Comments:

Poet-Christian E.S. TK Portable Classroom Building
Tracy Unified School District

RFI NO.:

Architect's Project # 3595001
DSA File/Apl. # 39-73/02-122130

Date: _____

1. REQUEST FOR INFORMATION

Attention: Affifa Kadhim

From:

Contractor:

Company _____

Contact: _____

Name _____

Sub Contractor: _____

Contact: _____

HMC Architects

Identify related specific references within the Contract Documents and supporting information:

Dwg./Document No.: _____

Building/Site Location: _____

2. Existing Condition (source / reason for the request):

3. Recommended Contractor Action(s) for resolution:

4. Project Inspector Acknowledgment:

Date Reviewed: _____

5. Owner / A/E Resolution(s):

Date of Response: _____ By: _____

Attachments: _____

Extra Work Involved in the Above Described Change?

Yes ☐

No ☐

Distribution: Contractor, Owner, Project Inspector, HMC, Other
See Specification Section 01300 for use of this form

Poet-Christian E.S. TK Portable Classroom Building
Tracy Unified School District

**E-DATA
REQUEST NO.:**

Architect's Project # 3595001
DSA File/Apl. # 39-73/02-122130

Date: _____

1. ELECTRONIC DATA REQUEST

Attention: Affifa Kadhim

From: Contractor: Company

Contact: Name

HMC Architects

Sub Contractor:

Contact: _____

2. DATA REQUESTED - Provide list of specific drawings requested (include sheet numbers):

3. REASON FOR REQUEST - Provide clear explanation of why information is desired and for what purpose it will be utilized:

4. ACKNOWLEDGEMENT OF RESPONSIBILITY:

The electronic data files requested are distributed for reference only. Transferring such files can alter, delete or change original information. Accuracy of the data cannot be guaranteed as correct or complete and the Contractor accepts full responsibility for any and all inaccuracies, regardless of cause.

The hard copy documents, including addenda and subsequent written changes to the documents, represent the complete work of the contract and all electronic files should be cross-referenced and verified from that information as electronic files may not contain all contract information. It is the Contractor's responsibility to make any changes or revisions necessary.

This electronic data is furnished without guarantee of compatibility with your hardware or software. It is the Contractor's responsibility to notify the Architect in the event a compatibility problem or disk defect is encountered and a replacement disk is necessary.

This electronic data, in its present form, remains the property of HMC Architects and shall not be used for any other purpose than to provide background information for the project noted above. It is not to be released to any other party without the written consent of HMC Architects.

Accepted by: _____
Signature - Contractor/Subcontractor

Representing: _____
Contractor/Subcontractor Company Name

MEGGER GROUNDING TEST CERTIFICATE

This certifies that a Megger Grounding Test for the **Poet-Christian Elementary School - TK Portable Classroom Building** for the **Tracy Unified** School District, of **San Joaquin** County, California was conducted on the _____ day of _____, **2024**, per CCR Title 24, Sections 200 H and J. The undersigned verifies that the resistance to ground was 25 ohms or less, as required, and is found to be acceptable.

Project Name: _____

DSA File No.: _____ DSA Application No.: _____

Address: _____

General Contractor's Signature: _____

Electrical Contractor's Signature: _____

Testing Agency's Signature: _____

District Inspector's Signature: _____

SEPARATE CERTIFICATE IS REQUIRED FOR EACH SITE

CERTIFICATION OF CHLORINATION AND STERILIZATION

This certifies that _____ chlorinated the domestic hot and cold water plumbing lines for the **Poet-Christian Elementary School - TK Portable Classroom Building, Tracy Unified** School District. The lines were first flushed and chlorine was injected in the main water line on _____, **2024**. A minimum chlorine residual of 50 ppm was measured at each outlet. The lines were tagged, secured and the make-up water was shut off. On _____, **2024**, (a minimum of 24 hours later) the chlorine residual was retested and found to contain a minimum of 50 ppm. The plumbing lines were then thoroughly flushed with fresh water until the chlorine residual was not greater than 0.2 ppm at all outlets. A Bacteriological Examination report has been provided.

District Inspector Signature: _____

Date _____

Name of Chlorination and Testing Firm: _____

Authorized Representative Signature: _____

Date _____

Name of General Contractor: _____

Authorized Representative Signature: _____

Date _____

CERTIFICATION OF COMPLIANCE FOR BUILDING MATERIALS

This is to certify, in accordance with the Environmental Protection Agency requirements, that the materials and equipment used in the construction of the **Poet-Christian Elementary School - TK Portable Classroom Building** for the **Tracy Unified** School District of **San Joaquin** County, California, are asbestos free and are, therefore, not subject to monitoring for asbestos contamination.

Project Name: _____

Address: _____

Contractor: _____

Address: _____

Signature: _____

Title: _____

Date: _____

SEPARATE CERTIFICATE IS REQUIRED FOR EACH SITE

SITE STANDARDS

PART 1 – GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including without limitation, Site Access, Conditions, and Regulations;
- B. Special Conditions;
- C. Drug-Free Workplace Certification;
- D. Tobacco-Free Environment Certification;
- E. Criminal Background Investigation/Fingerprinting Certification;
- F. Temporary Facilities and Controls.

1.02 REQUIREMENTS OF THE DISTRICT:

- A. Drug-Free Schools and Safety Requirements:
 - (1) All school sites and other District Facilities have been declared "Drug-Free Zones." No drugs, alcohol and/or smoking are allowed at any time in any buildings and/or grounds on District property. No students, staff, visitors, or contractors are to use drugs on these sites.
 - (2) Smoking and the use of tobacco products by all persons is prohibited on or in District property. District property includes school buildings, school grounds, school-owned vehicles and vehicles owned by others while on District property. Contractor shall post: "Non-Smoking Area" in a highly visible location in each work area, staging area, and parking area. Contractor may designate a smoking area outside of District property within the public right-of-way, provided that this area remains quiet and unobtrusive to adjacent neighbors. This smoking area is to be kept clean at all times.
 - (3) Contractor shall ensure that no alcohol, firearms, weapons, or controlled substances enter or are used at the Site. Contractor shall immediately remove from the Site and terminate the employment of any employee(s) found in violation of this provision.
- B. Language: Profanity or other unacceptable and/or loud language will not be tolerated, "Cat calls" or other derogatory language toward students, staff, volunteers, parents or public will not be allowed.

C. Disturbing the Peace (Noise and Lighting):

- (1) Contractor shall observe the noise ordinance of the Site at all times including, without limitation, all applicable local, city, and/or state laws, ordinances, and/or regulations regarding noise and allowable noise levels.
- (2) The use of radios, etc., shall be controlled to keep all sound at a level that cannot be heard beyond the immediate area of use. District reserves the right to prohibit the use of radios at the Site, except for mobile phones or other handheld communication radios.
- (3) If portable lights are used after dark, all light must be located so as not to direct light into neighboring property.

D. Traffic:

- (1) Driving on the Premises shall be limited to periods when students and public are not present. If driving or deliveries must be made during the school hours, two (2) or more ground guides shall lead the vehicle across the area of travel. In no case shall driving take place across playgrounds or other pedestrian paths during recess, lunch, and/or class period changes. The speed limit on-the Premises shall be five (5) miles per hour (maximum) or less if conditions require.
- (2) All paths of travel for deliveries, including without limitation, material, equipment, and supply deliveries, shall be reviewed and approved by District in advance. Any damage will be repaired to the pre-damaged condition by the Contractor.
- (3) District shall designate a construction entry to the Site. If Contractor requests, District determines it is required, and to the extent possible, District shall designate a staging area so as not to interfere with the normal functioning of school facilities. Location of gates and fencing shall be approved in advance with District and at Contractor's expense.
- (4) Parking areas shall be reviewed and approved by District in advance. No parking is to occur under the drip line of trees or in softscape areas that could otherwise be damaged.

- E. All of the above shall be observed and complied with by the Contractor and all workers on the Site. Failure to follow these directives could result in individual(s) being suspended or removed from the work force at the discretion of the District. The same rules and regulations shall apply equally to delivery personnel, inspectors, consultants, and other visitors to the Site.

PART 2 - PRODUCTS Not Used.

PART 3 - EXECUTION Not Used.

END OF DOCUMENT

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Special environmental, sustainable, and “green” building practices related to indoor air quality, resource efficiency supplementing the Pollutant Control requirements specified under Section 01 8113.10, Sustainable Design Requirements, and to ensure healthy indoor air quality in final Project.
- B. Contractor is required to comply with sustainable building practices during construction and when considering materials for substitutions. Refer to Article “Design Requirements.”

1.2 RELATED REQUIREMENTS

- A. Section 01 6116, Volatile Organic Compound (VOC) Restrictions.
- B. Section 01 50 13, Construction Waste Management and Disposal.
- C. Section 01 8113, Sustainable Design Requirements.

1.3 ADMINISTRATIVE REQUIREMENTS

- A. Submittal Procedures:
 - 1. Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
 - 2. Sustainable Design Submittals shall comply with the additional requirement of Section 01 8113, Sustainable Design Requirements.
 - 3. Closeout Submittals shall be submitted in accordance with document 01 7700, Closeout Procedures.

1.4 DESIGN REQUIREMENTS

- A. Owner has established general environmental goals for design and for construction of the Project.
 - 1. In addition to the Contractor, the Contractor’s construction team, including subcontractors, suppliers, and manufacturers, are encouraged to participate where possible to realize the Owner’s environmental goals.
 - 2. Intent is for environmental goals to be achieved in a manner which ultimately provides a safe and healthy environment for building occupants with minimal impact on the local, regional and global environment.
- B. Environmental Goals:
 - 1. Refer to specific Specifications Sections for more detailed construction requirements related to specific materials and systems.

ENVIRONMENTAL PROCEDURES
SECTION 01 3543
3595001

1.5 INFORMATIONAL SUBMITTALS

A. Indoor Air Quality (IAQ) Data:

1. Environmental Issues: Submit emission test data produced by acceptable testing laboratory, listed in this Specification Article "Quality Assurance," for materials as required in each specific Specification Section.
 - a. Laboratory reports shall contain emissions test data on Volatile Organic Compounds (VOCs) including Total Volatile Organic Compounds (TVOC), specific individual VOCs, formaldehyde and other aldehydes as described in this Section.
 - b. Identify VOCs emitted by each material as required in these Specifications, and demonstrate compliance with the California Green Building Standards Code, edition current as of the date of this Contract.
 - c. Specific test conditions and requirements are set forth in the Specifications. For required tests, submit documentation of sample acquisition, handling, and test specimen preparation, as well as test conditions, methods, and procedures. The tests consist of a 10-day conditioning period followed by a 96-hour test period.
 - 1) Samples collected during the test period at 24, 48, and 96-hours shall be analyzed for TVOC and formaldehyde.
 - 2) VOC samples collected at 96 hours shall be identified and quantified for compounds that are found on the list of Chemicals of Concern. The Chemicals of Concern list is based on the California OEHHA list as of September 2002 (The most recent list shall be used for this Specification as published at:
 - a) http://www.oehha.org/air/chronic_rels/allChrels.html.
2. Cleaning and Maintenance Products: Provide data on manufacturers' recommended maintenance, cleaning, refinishing and disposal procedures for materials and products. These procedures are for final Contractor cleaning of the project prior to Substantial Completion and for provided materials and products as required by the specific Specification Sections.
 - a. Where chemical products are recommended for these procedures, provide documentation to indicate that no component present in the cleaning product at more than 1 percent of the total mass of the cleaning product is a carcinogen or reproductive toxicant as identified in the Chemicals of Concern list referenced above.
 - b. Avoid cleaning products containing alpha-pinene, d-limonene or other unsaturated carbon double bond alkenes due to chemical reactions with ozone to form aldehydes, acidic aerosols, and ultra-fine particulate matter in indoor air.

B. Certificates:

1. Prior to Final Completion, submit a certificate signed by corporate office holder of Contractor, subcontractor, supplier, vendor, installer or manufacturer primarily responsible for the manufacturing of the product, indicating materials provided are

essentially the same, and contain essentially the same components as products and materials tested.

2. Comply with requirements specified in Specification Section 01 7700, Closeout Procedures.

1.6 CLOSEOUT SUBMITTALS

- A. Submit data relating to Environmental Issues.
 1. Submit environmental product certifications, in two forms:
 - a. Two CD-ROMs organized by CSI Division Format.
 - b. Three three-ring binders organized by CSI Division Format with Table of Contents and with dividers for each Division.

1.7 QUALITY ASSURANCE

- A. Environmental Project Management and Coordination: Contractor to identify one person on Contractor's staff to be responsible for environmental issues compliance and coordination.
 1. Experience: Environmental project manager shall have experience relating to sustainable building construction.
 2. Responsibilities: Carefully review the Contract Documents for environmental issues, coordinate work of trades, subcontractors, and suppliers; instruct workers relating to environmental issues; and oversee Project Environmental Goals.
 3. Meetings: Discuss Environmental Goals at following meetings.
 - a. Pre-construction meeting.
 - b. Pre-installation meetings.
 - c. Regularly scheduled job-site meetings.
 - d. Special sustainability issues meetings.
- B. Environmental Issues Criteria: Comply with requirements listed in the Specification Sections.
- C. Acceptable Indoor Air Emissions Testing Laboratories:
 1. Selection of testing laboratories shall include assessment of prior experience in conducting indoor source emissions tests.
 2. The proposed laboratory shall be an independent company or organization not related to the manufacturer of the products to be tested.
 3. Submit documentation on proposed laboratory for review and approval by Owner.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Packaging: Deliver materials in recyclable or in reusable packaging such as cardboard, wood, paper, or reusable blankets, which will be reclaimed by supplier or manufacturer for recycling.

ENVIRONMENTAL PROCEDURES

SECTION 01 3543

3595001

1. Minimize packaging materials to maximum extent possible while still ensuring protection of materials during delivery, storage, and handling.
 2. Unacceptable Packaging Materials: Polyurethane, polyisocyanate, polystyrene, polyethylene, and similar plastic materials such as “foam” plastics and “shrink-fit” plastics.
 3. Reusable Blankets: Deliver and store materials in reusable blankets and mats reclaimed by the manufacturers or suppliers for reuse where the reclamation program exists or where a program can be developed for such reuse.
 4. Pallets: Where pallets are used, suppliers shall be responsible to ensure pallets are removed from site for reuse or for recycling.
 5. Corrugated Cardboard and Paper: Where paper products are used, recycle as part of the construction waste management recycling program, or return to the material’s manufacturer for use by the manufacturer or supplier.
 6. Sealants, Paint, Primers, Adhesives, and Coating Containers: Return to the supplier or manufacturer for reuse where such program is available.
- B. Comply with the additional requirements specified in Section 01 7419, Construction Waste Management and Disposal.

1.9 FIELD CONDITIONS

- A. No smoking will be permitted in indoor Project site locations, in accordance with California Labor Code (Section 400-6413.5).
- B. Environmental Product Certification:
1. Include certification that indicates cleaning materials comply with requirements of these Specifications.
- C. Construction Ventilation and Preconditioning:
1. Temporary Construction Ventilation: Maintain sufficient temporary ventilation of areas where materials are being used that emit VOCs. Maintain ventilation continuously during installation, and until emissions dissipate following installation. If continuous ventilation is not possible utilizing the building’s HVAC system(s) then ventilation shall be supplied using open windows and temporary fans, sufficient to provide no less than three air changes per hour.
 - a. Period after installation shall be sufficient to dissipate odors and elevated concentrations of VOCs. Where no specific period is stated in these Specifications, a time period of 72 hours shall be used.
 - b. Ventilate areas directly to outside; ventilation to other enclosed areas is not acceptable.
 2. During dust producing activities, including drywall installation and finishing, turn ventilation system off, and openings in supply and return HVAC system shall be protected from dust infiltration. Provide temporary ventilation as required.
 3. Preconditioning: Prior to installation, allow products which have odors and significant VOC emissions to off-gas in dry, well-ventilated space for 14 calendar days to allow for reasonable dissipation of odors and emissions prior to delivery to Project site and installation.

- a. Condition products without containers and packaging to maximize off-gassing of VOCs
- b. Condition products in ventilated warehouse or other building. Comply with substitution requirements for consideration of other locations.

D. Protection:

- 1. Moisture Stains: Materials with evidence of moisture damage, including stains, are not acceptable, including both stored and installed materials; immediately remove from site and properly dispose.
 - a. Take special care to prevent an accumulation of moisture on installed materials and within packaging during delivery, storage, and handling to prevent development of molds and mildew on packaging and on products
 - b. Immediately remove from site and properly dispose of materials showing signs of mold and signs of mildew, including materials with moisture stains.
 - c. Replace moldy materials with new, undamaged materials.
- 2. Ducts: Seal ducts during transportation, delivery, and construction to prevent accumulation of construction dust and construction debris inside of ducts.

PART 2 - PRODUCTS

2.1 SUBSTITUTIONS

- A. Requests for substitutions shall comply with requirements specified in Specification Section 01 3300, Submittals, and with the following additional information required where environmental issues are specified:
 - 1. Indicate how each proposed substitution complies with requirements for VOCs.
 - 2. Owner, in consultation with Architect reserve the right to reject proposed substitutions where data for VOCs is not provided or where emissions of individual VOCs are higher than for the specified materials.
 - 3. Comply with the specified recycled content and other environmental requirements.

PART 3 - EXECUTION

3.1 FIELD QUALITY CONTROL

- A. Sequencing:
 - 1. On-Site Application: Where odorous and/or high VOC emitting products are applied on-site, apply prior to installation of porous and fibrous materials. Where this is not possible, protect porous materials with polyethylene vapor retarders.
 - 2. Complete interior finish material installation no less than 14 days prior to Substantial Completion to allow for Building Flush Out as described in Paragraph 3.1B.

ENVIRONMENTAL PROCEDURES

SECTION 01 3543

3595001

- B. Building Flush Out: Just prior to Substantial Completion, flush out building air continuously using maximum tempered outside air, or maximum amount of outside air while achieving reasonable indoor temperature, for at least 14 calendar days. Continuously is defined as 24 hours per day, 7 days a week. If interruptions of more than a few hours are required for testing and balancing purposes, extend flush out period accordingly in order to achieve the minimum 14 calendar day building flush out period.
 - 1. When Contractor is required to perform touch-up work, provide temporary construction ventilation during installation and extend building flush-out by a minimum of 4 calendar days after touch-up installation is complete with maximum tempered outside air for 24 hours per day.
 - 2. If construction schedule permits, extend flush-out period beyond minimum building flush out period for an additional 15 days.
 - 3. Return ventilation system to normal operation following flush-out period to minimize energy consumption.

3.2 CLEANING

- A. Clean interior and exterior surfaces exposed to view; remove temporary labels, stains, and foreign substances; polish transparent and glossy surfaces using cleaning and maintenance products that conform to standards as described in Part 1 of this Section.
- B. Clean equipment and fixtures to sanitary condition using cleaning and maintenance products that conform to standards as described in Part 1 of this Section.
- C. Products used for cleaning shall comply with Proposition 65 and the additional restrictions for volatile organic compounds specified in Section 01 6116.
- D. Vacuum carpeted and soft surfaces with high efficiency particulate arrestor (HEPA) vacuum.
- E. If ducts were not sealed during construction, and contain dust or dirt, clean ducts using HEPA vacuum immediately prior to Substantial Completion and prior to using ducts to circulate air. Oil film on sheet metal shall be removed before shipment to site. Ducts shall be inspected to confirm that no oil film is present. Remove oil film.
- F. Replace air filters, both pre and final filters, just prior to Substantial Completion.
- G. Remove and properly dispose of recyclable materials using construction waste management program described in Section 01 7419, Construction Waste Management and Disposal.

3.3 PROTECTION

- A. Protect interior materials from water intrusion or penetration where interior products are not intended for wet applications and are exposed to moisture.
- B. Protect installed products using methods that do not support growth of mold and mildew.
 - 1. Immediately remove from site materials with mold or mildew.

END OF SECTION

*p:\sacramento\3595 tracy unified school district\001-000_villalovoz es new shade structures\08 specifications\06 spec\04
final\freiler\01 3543_environmental procedures.docx*

REGULATORY REQUIREMENTS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Obtaining of Permits, Licenses and Registrations and Work to Comply with All Applicable Laws and Regulations;
- B. Special Conditions; and
- C. Quality Control.

1.02 DESCRIPTION:

This section covers the general requirements for regulatory requirements pertaining to the Work and is supplementary to all other regulatory requirements mentioned or referenced elsewhere in the Contract Documents.

1.03 REQUIREMENTS OF REGULATORY AGENCIES:

- A. All statutes, ordinances, laws, rules, codes, regulations, standards, and the lawful orders of all public authorities having jurisdiction over the Work, are hereby incorporated into these Contract Documents as if repeated in full herein and are intended to be included in any reference to Code or Building Code, unless otherwise specified, including, without limitation, the references in the list below. Contractor shall make available at the Site copies of all the listed documents applicable to the Work as the District and/or Architect may request, including, without limitation, applicable portions of the California Code of Regulations ("CCR").
 - (1) California Building Standards Administrative Code, Part 1, Title 24, CCR.
 - (2) California Building Code (CBC), Part 2, Title 24, CCR; (International Building Code volumes 1-2 and California Amendments).
 - (3) California Electrical Code (CEC), Part 3, Title 24, CCR; (National Electrical Code and California Amendments).
 - (4) California Mechanical Code (CMC), Part 4, Title 24, CCR; (Uniform Mechanical Code and California Amendments).
 - (5) California Plumbing Code (CPC), Part 5, Title 24, CCR; (Uniform Plumbing Code and California Amendments).

- (6) California Fire Code (CFC), Part 9, Title 24, CCR; (International Fire Code and California Amendments).
- (7) California Green Building Standards Code (CALGreen), Part 11, Title 24, CCR.
- (8) California Referenced Standards Code, Part 12, Title 24, CCR.
- (9) State Fire Marshal Regulations, Public Safety, Title 19, CCR.
- (10) Partial List of Applicable National Fire Protection Association (NFPA) Standards:
 - (a) NFPA 13 - Automatic Sprinkler System.
 - (b) NFPA 14 - Standpipes Systems.
 - (c) NFPA 17A - Wet Chemical System
 - (d) NFPA 24 - Private Fire Mains.
 - (e) (California Amended) NFPA 72 - National Fire Alarm Codes.
 - (f) NFPA 253 - Critical Radiant Flux of Floor Covering System.
 - (g) NFPA 2001 - Clean Agent Fire Extinguishing Systems.
- (11) California Division of the State Architect interpretation of Regulations ("DSA IR"), including, without limitation:
 - (a) DSA IR A-6 — Construction Change Document Submittal and Approval Processes.
 - (b) DSA IR A-7 — Project Inspector Certification and Approval.
 - (c) DSA IR A-8 — Project Inspector and Assistant Inspector Duties and Performance.
 - (d) DSA IR A-12 — Assistant Inspector Approval.
- (12) DSA Procedures ("DSA PR")
 - (a) DSA PR 13-01 – Construction Oversight Process
 - (b) DSA PR 13-02 – Project Certification Process

B. This Project shall be governed by applicable regulations, including, without limitation, the State of California's Administrative Regulations for the Division of the State Architect-Structural Safety (DSA/SS), Chapter 4, Part 1, Title 24, CCR, and the most current version on the date the bids are opened and as it pertains to school construction including, without limitation:

- (1) Test and testing laboratory per Section 4-335. District shall pay for the testing laboratory.
- (2) Special inspections per Section 4-333(c).
- (3) Deferred Approvals per section 4-317(g).
- (4) Verified reports per Sections 4-336 & 4-343(c).
- (5) Duties of the Architect & Engineers shall be per Sections 4-333(a) and 4-341.
- (6) Duties of the Contractor shall be per Section 4-343.
- (7) Duties of Project Inspector shall be per Section 4-334.
- (8) Addenda and Construction Change Documents per Section 4-338.

Contractor shall keep and make available all applicable parts of the most current version of Title 24 referred to in the plans and specifications at the Site during construction.

C. Items of deferred approval shall be clearly marked on the first sheet of the Architect's and/or Engineer's approved Drawings. All items later submitted for approval shall be per Title 24 requirements to the DSA.

- (1) Contractor shall submit the following to Architect for review and endorsement:
 - (a) Product information on proposed material/system supplier.
 - (b) Drawings, specifications, and calculations prepared, signed, and stamped by an architect or engineer licensed in the State of California for that portion of the Work.
 - (c) All other requirements as may be required by DSA.
- (2) Cost of preparing and submitting documentation per DSA Deferred Approval requirements including required modifications to Drawings and Specifications, whether or not indicated in the Contract Documents, shall be borne by Contractor.
- (3) Contractor shall not begin fabrication and installation of deferred approval items without first obtaining DSA approval of Drawings and Specifications.
- (4) Schedule of Work Subject to DSA Deferred Approval: Window wall systems exceeding 10 feet in span.

PART 2 – PRODUCTS Not Used.

PART 3 – EXECUTION Not Used.

END OF DOCUMENT

ABBREVIATIONS AND ACRONYMS

PART 1 – GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions including without limitation, Definitions;
- B. Special Conditions.

1.02 DOCUMENT INCLUDES:

- A. Abbreviations used throughout the Contract Documents.
- B. Reference to a technical society, organization, or body is by abbreviation, as follows:

1.	AA	The Aluminum Association
2.	AASHTO	American Association of State Highway and Transportation Officials
3.	ABPA	Acoustical and Board Products Association
4.	ACI	American Concrete Institute
5.	AGA	American Gas Association
6.	AGC	Associated General Contractors of America
7.	AHC	Architectural Hardware Consultant
8.	AHRI	Air Conditioning, Heating, Refrigeration Institute
9.	AI	Asphalt Institute
10.	AIA	American Institute of Architects
11.	AISC	American Institute of Steel Construction
12.	AISI	American Iron and Steel Institute
13.	AMCA	Air Movement and Control Association
14.	ANSI	American National Standards Institute
15.	APA	APA – The Engineered Wood Association
16.	ASCE	American Society of Civil Engineers
17.	ASHRAE	American Society of Heating, Refrigeration and Air Conditioning Engineers
18.	ASME	American Society of Mechanical Engineers
19.	ASTM	American Society of Testing and Materials International
20.	AWPA	American Wood Protection Association
21.	AWPI	American Wood Preservers Institute
22.	AWS	American Welding Society
23.	AWSC	American Welding Society Code
24.	AWI	Architectural Woodwork Institute
25.	AWWA	American Water Works Association
26.	BIA	The Brick Industry Association

27.	CCR	California Code of Regulations
28.	CLFMI	Chain Link Fence Manufacturers Institute
29.	CRA	California Redwood Association
30.	CRSI	Concrete Reinforcing Steel Institute
31.	CS	Commercial Standards
32.	CSI	Construction Specifications Institute
33.	CTI	Cooling Technology Institute
34.	FGIA	Fenestration and Glazing Industry Alliance
35.	FGMA	Flat Glass Manufacturers' Association
36.	FIA	Factory Insurance Association
37.	FM	Factory Mutual Global
38.	FS/FED SPEC	Federal Specification
39.	FTI	Facing Title Institute
40.	GA	Gypsum Association
41.	IAPMO	International Association of Plumbing and Mechanical Officials
42.	ICC	International Code Council
43.	IEEE	Institute of Electrical and Electronics Engineers
44.	IES	Illuminating Engineering Society
45.	MCAC	Mason Contractors Association of California
46.	MIMA	Mineral Wool Insulation Manufacturers Association
47.	MLMA	Metal Lath Manufacturers Association
48.	MS/MIL SPEC	Military Specifications
49.	NAAMM	National Association of Architectural Metal Manufacturers
50.	NBHA	National Builders Hardware Association
51.	NCMA	National Concrete Masonry Association
52.	NCSEA	National Council of Structural Engineers Associations
53.	NEC	National Electrical Code
54.	NEMA	National Electrical Manufacturers Association
55.	NIST	National Institute of Standards and Technology
56.	NSI	Natural Stone Institute
57.	NTMA	National Terrazzo and Mosaic Association, Inc.
58.	ORS	Office of Regulatory Services (California)
59.	OSHA	Occupational Safety and Health Act
60.	PCI	Precast/Prestressed Concrete Institute
61.	PCA	Portland Cement Association
62.	PCA	Painting Contractors Association
63.	PDI	Plumbing Drainage Institute
64.	PEI	Porcelain Enamel Institute, Inc.
65.	PG&E	Pacific Gas & Electric Company
66.	PS	Product Standards
67.	SDI	Steel Door Institute; Steel Deck Institute
68.	SJI	Steel Joist Institute
69.	SSPC	Society for Protective Coatings
70.	TCNA	Tile Council of North America, Inc.
71.	TPI	Truss Plate Institute
72.	UBC	Uniform Building Code
73.	UL	Underwriters Laboratories Code

74.	UMC	Uniform Mechanical Code
75.	USDA	United States Department of Agriculture
76.	VI	Vermiculite Institute
77.	WCLIB	West Coast Lumber Inspection Bureau
78.	WDMA	Window and Door Manufacturers Association
79.	WEUSER	Western Electric Utilities Service Engineering Requirements
80.	WIC	Woodwork Institute of California

PART 2 - PRODUCTS Not Used.

PART 3 - EXECUTION Not Used.

END OF DOCUMENT

DEFINITIONS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions including without limitation, Definitions;
- B. Special Conditions.

1.02 QUALITY ASSURANCE

- A. For products or workmanship specified by association, trade, or Federal Standards, Contractor shall comply with requirements of the standard, except when more rigid requirements are specified in the Contract Documents, or are required by applicable codes.
- B. Contractor shall conform to current reference standard publication date in effect on the date of bid opening.
- C. Contractor shall obtain copies of standards unless specifically required not to by the Contract Documents.
- D. Contractor shall maintain a copy of all standards at jobsite during submittals, planning, and progress of the specific Work, until final completion, unless specifically required not to by the Contract Documents.
- E. Should specified reference standards conflict with Contract Documents, Contractor shall request clarification from the District and/or the Architect before proceeding.
- F. The contractual relationship of the parties to the Contract shall not be altered from the contractual relationship as indicated in the Contract Documents by mention or inference otherwise in any referenced document.
- G. Governing Codes shall be as shown in the Contract Documents including, without limitation, the Specifications.

END OF DOCUMENT

REFERENCES**PART 1 - GENERAL****1.01 SCHEDULE OF REFERENCES:**

The following information is intended only for the general assistance of the Contractor, and the District does not represent that all of the information is current. It is the Contractor's responsibility to verify the correct information for each of the entities listed.

AA	The Aluminum Association 1400 Crystal Drive, Suite 430 Arlington, VA 22202 www.aluminum.org	703/358-2960
AABC	Associated Air Balance Council 2401 Pennsylvania Avenue NW, Suite 330 Washington, DC 20037 www.aabc.com	202/737-0202
AASHTO	American Association of State Highway and Transportation Officials 555 12th St. NW - Suite 1000 Washington, DC 20004 www.transportation.org	202/624-5800
AATCC	American Association of Textile Chemists and Colorists P.O. Box 12215 Research Triangle Park, NC 27709-2215 www.aatcc.org	919/549-8141
ACA	American Coatings Association 901 New York Ave., NW, Suite 300 West Washington, DC 20001 www.paint.org	202/462-6272
ACI	American Concrete Institute 38800 Country Club Dr. Farmington Hills, MI 48331-3439 www.concrete.org	248/848-3800
ACPA	American Concrete Pipe Association 5605 N. MacArthur Blvd., Suite 340 Irving, TX 75038 www.concrete-pipe.org	972/506-7216

ADC	Air Duct Council 1901 N. Roselle Road, Suite 800 Schaumburg, IL 60195 www.flexibleduct.org	847/706-6750
AF&PA	American Forest and Paper Association 1101 K Street, NW, Suite 700 Washington, DC 20005 www.afandpa.org	202/463-2700
AGA	American Gas Association 400 North Capitol Street, NW, Suite 450 Washington, DC 20001 www.aga.org	202/824-7000
AGC	Associate General Contractors of America 2300 Wilson Blvd., Suite 300 Arlington, VA 22201 www.agc.org	703/548-3118
AHA	American Hardboard Association 1210 West Northwest Highway Palatine, IL 60067 http://domensino.com/AHA/default.htm	847/934-8800
AI	Asphalt Institute 2696 Research Park Drive Lexington, KY 40511-8480 www.asphaltinstitute.org	859/288-4960
AIA	The American Institute of Architects 1735 New York Ave., NW Washington, DC 20006-5292 www.aia.org	202/626-7300
AISC	American Institute of Steel Construction 130 East Randolph Street, Suite 2000 Chicago, IL 60601 www.aisc.org	312.670.2400
AISI	American Iron and Steel Institute 25 Massachusetts Ave., NW, Suite 800 Washington, DC 20001 www.steel.org	202/452-7100
AITC	American Institute of Timber Construction 1010 South 336th Street, #210 Federal Way, WA 98003-7394 https://www.plib.org/aitc/	253/835-3344

ALI	Associated Laboratories, Inc. P.O. Box 152837 Dallas, TX 75315 www.assoc-labs.com	214/565-0593
ALSC	American Lumber Standards Committee, Inc. 7470 New Technology Way, Suite F Frederick, MD 21703 www.alsc.org	301/972-1700
AMCA	Air Movement and Control Association International, Inc. 30 W. University Drive Arlington Heights, IL 60004 www.amca.org	847/394-0150
AMPP (formerly SSPC)	Association for Materials Protection and Performance (merger of Society for Protective Coatings and National Association of Corrosion Engineers International) (formerly Steel Structures Painting Council) 800 Trumbull Drive Pittsburgh, PA 15205 www.sspc.org	412/281-2331 877/281-7772
ANLA	AmericanHort (merger of American Nursery & Landscape Association and OFA – The Association of Horticultural Professionals) 2130 Stella Court Columbus, OH 43215 www.americanhort.org	614/487-1117
ANSI	American National Standards Institute 1899 L Street, NW, 11th Floor Washington, DC 20036 www.ansi.org	202/293-8020
APA	APA-The Engineered Wood Association 7011 S. 19th Street Tacoma, WA 98466-5333 www.apawood.org	253/565-6600

APA	Architectural Precast Association 325 John Knox Rd, Suite L-103 Tallahassee, FL 32303 www.archprecast.org	850/205-5637
APCIA	American Property Casualty Insurance Association (merger of American Insurance Association (formerly the National Board of Fire Underwriters) with the Property Casualty Insurers Association of America) 555 12th St, NW, Suite 550 Washington DC 20004 www.apci.org	202/828-7100
AHRI	Air Conditioning and Refrigeration Institute (now Air-Conditioning, Heating, & Refrigeration Institute) 2311 Wilson Blvd, Suite 400 Arlington, VA 22201 www.ahrinet.org	703/524-8800
ARMA	Asphalt Roofing Manufacturers Association 2331 Rock Spring Road Forest Hill, MD 21050 www.asphaltroofing.org	443/640-1075
ASA	The Acoustical Society of America Suite 300 1305 Walt Whitman Road Melville, NY 11747-4300 https://acousticalsociety.org/	516/576-2360
ASCE	American Society of Civil Engineers 1801 Alexander Bell Drive Reston, VA 20191 www.asce.org	800/548-2723 703/295-6300
ASHRAE	American Society of Heating, Refrigerating and Air Conditioning Engineers 180 Technology Parkway Peachtree Corners, GA 30092 www.ashrae.org	800/527-4723 404/636-8400
ASLA	American Society of Landscape Architects 636 Eye Street, NW Washington, DC 20001-3736 www.asla.org	202/898-2444
ASME	American Society of Mechanical Engineers Two Park Avenue New York, NY 10016-5990 www.asme.org	800/834-2763

ASPE	American Society of Plumbing Engineers 6400 Shafer Court, Suite 350 Rosemont, IL 60018 http://aspe.org	847/296-0002
ASQ	American Society for Quality P.O. Box 3005 Milwaukee, WI 53201-3005 or 600 North Plankinton Avenue Milwaukee, WI 53203 http://asq.org	800/248-1946 414/272-8575
ASSE	American Society of Sanitary Engineering 18927 Hickory Creek Dr., Suite 220 Mokena, IL 60448 www.asse-plumbing.org	708/995-3019
ASTM	ASTM International 100 Barr Harbor Drive PO Box C700 West Conshohocken, PA, 19428-2959 www.astm.org	610/832-9500
AWCI	Association of the Wall and Ceiling Industry 513 West Broad Street, Suite 210 Falls Church, VA 22046 www.awci.org	703/538-1600
AWPA	American Wood Protection Association (formerly American Wood Preservers Institute) P.O. Box 361784 Birmingham, AL 35236-1784 www.awpa.com	205/733-4077
AWS	American Welding Society 8669 NW 36 Street, Suite 130 Miami, FL 33166 www.aws.org	800/443-9353 305/443-9353
AWI	Architectural Woodwork Institute 46179 Westlake Drive, Suite 120 Potomac Falls, VA 20165-5874 www.awinet.org	571/323-3636
AWWA	American Water Works Association 6666 West Quincy Avenue Denver, CO 80235 www.awwa.org	800/926-7337 303/794-7711

BHMA	Builders Hardware Manufacturers Association 355 Lexington Avenue, 15th Floor New York, NY 10017 www.buildershardware.com	212/297-2122
BIA	The Brick Industry Association 12007 Sunrise Valley Drive, Suite 430 Reston, VA 20191 www.gobrick.com	703/620-0010
CGA	Compressed Gas Association 8484 Westpark Drive, Suite 220 McLean, VA 22102 www.cganet.com	703/788-2700
CISCA	Ceilings & Interior Systems Construction Association 1010 Jorie Blvd, Suite 30 Oak Brook, IL 60523 www.cisca.org	630/584-1919
CISPI	Cast Iron Soil Pipe Institute 2401 Fieldcrest Dr. Mundelein, IL 60060 www.cispi.org	224/864-2910
CLFMI	Chain Link Fence Manufacturers Institute 10015 Old Columbia Road, Suite B-215 Columbia, MD 21046 chainlinkinfo.org	301/596-2583
CPA	Composite Panel Association 19465 Deerfield Avenue, Suite 306 Leesburg, VA 20176 www.compositepanel.org	703/724-1128
CPSC	Consumer Product Safety Commission 4330 East-West Highway Bethesda, MD 20814 www.cpsc.gov	800/638-2772
CRA	California Redwood Association 818 Grayson Road, Suite 201 Pleasant Hill, CA 94523 www.calredwood.org	925/935-1499

CRI	Carpet and Rug Institute 100 S. Hamilton Street Dalton, GA 30722-2048 www.carpet-rug.org	706/278-3176
CRSI	Concrete Reinforcing Steel Institute 933 N. Plum Grove Road Schaumburg, IL 60173-4758 www.crsi.org	847/517-1200
CSI	The Construction Specifications Institute 123 North Pitt St, Suite 450 Alexandria, VA 22314 www.csinet.org	800/689-2900
CTIOA	Ceramic Tile Institute of America 12061 Jefferson Blvd. Culver City, CA 90230-6219 www.ctioa.org	310/574-7800
DHA	Decorative Hardwoods Association (formerly Hardwood Plywood & Veneer Association) 42777 Trade West Dr. Sterling, VA 20166 https://www.decorativehardwoods.org/	703/435-2900
DHI	Door and Hardware Institute (formerly National Builders Hardware Association) 2001 K Street NW, 3rd Floor North Washington, DC 20006 www.dhi.org	202/367-1134
DIPRA	Ductile Iron Pipe Research Association P.O. Box 190306 Birmingham, AL 35219 www.dipra.org	205/402-8700
DOC	U.S. Department of Commerce 1401 Constitution Ave., NW Washington, DC 20230 www.commerce.gov	202/482-2000
DOT	U.S. Department of Transportation 1200 New Jersey Avenue, SE Washington, DC 20590 www.dot.gov	855/368-4200
EJMA	Expansion Joint Manufacturers Association, Inc. 25 North Broadway Tarrytown, NY 10591 www.ejma.org	914/332-0040

EPA	Environmental Protection Agency Ariel Rios Building 1200 Pennsylvania Avenue, N.W. Washington, DC 20460 www.epa.gov	202/272-0167
FCICA	Floor Covering Installation Contractors Association 800 Roosevelt Rd., Bldg. C, Suite 312 Glen Ellyn, IL 60137 www.fcica.com	630/672-3702
FGIA	Fenestration and Glazing Industry Alliance 1900 E Golf Rd, Suite 1250 Schaumburg, IL 60173 https://fgiaonline.org/	847/303-5664
FM Global	Factory Mutual Insurance Company Amy Daley Global Practice Leader – Education, Public Entities, Health Care FM Global 270 Central Avenue Johnston, RI 02919-4949 www.fmglobal.com	401/275-3000 401/275-3029
FS	General Services Administration (GSA) Index of Federal Specifications, Standards and Commercial Item Descriptions 470 East L'Enfant Plaza, SW, Suite 8100 Washington, DC 20407 www.gsa.gov	202/619-8925
GA	The Gypsum Association 962 Wayne Ave., Suite 620 Silver Spring, MD 20910 www.gypsum.org	301/277-8686
HMA	Hardwood Manufacturers Association One Williamsburg Place, Suite 108 Warrendale, PA 15086 http://hmamembers.org	412/244-0440

IAPMO	International Association of Plumbing and Mechanical Officials (formerly the Western Plumbing Officials Association) 4755 E. Philadelphia St. Ontario, CA 91761 www.iapmo.org	909/472-4100
ICC	International Code Council 500 New Jersey Avenue, NW, 6th Floor Washington, DC 20001 www.iccsafe.org	888/422-7233
IEEE	Institute of Electrical and Electronics Engineers 3 Park Avenue, 17th Floor New York, NY 10016-5997 www.ieee.org	212/419-7900
IES	Illuminating Engineering Society 120 Wall Street, Floor 17 New York, NY 10005-4001 www.ies.org	212/248-5000
ITRK	Intertek Testing Services 3933 US Route 11 Cortland, NY 13045 www.intertek.com	607/753-6711
MCAA	Mechanical Contractors Association of America 1385 Piccard Drive Rockville, MD 20850 www.mcaa.org	301/869-5800
MMPA (formerly WMMPA)	Moulding & Millwork Producers Association (formerly Wood Moulding & Millwork Producers Association) 507 First Street Woodland, CA 95695 www.wmmpa.com	530/661-9591 800/550-7889
MSS	Manufacturers Standardization Society (MSS) of the Valve and Fittings Industry, Inc. 127 Park Street, NE Vienna, VA 22180-4602 http://mss-hq.org	703/281-6613
NAAMM	National Association of Architectural Metal Manufacturers 800 Roosevelt Rd. Bldg. C, Suite 312 Glen Ellyn, IL 60137 www.naamm.org	630/942-6591

NAIMA	North American Insulation Manufacturers Association P.O. Box 1906 Alexandria, VA 22313 https://insulationinstitute.org/	703/684-0084
NALP	National Association of Landscape Professionals (formerly Professional Landcare Network) 12500 Fair Lakes Circle, Suite 200 Fairfax, VA 22033 https://www.landscapeprofessionals.org/	703/736-9666
NAPA	National Asphalt Pavement Association 6406 Ivy Lane, Suite 350 Greenbelt, MD 20770-1441 www.asphaltpavement.org	888/468-6499 301/731-4748
NCSPA	National Corrugated Steel Pipe Association 14070 Proton Road, Suite 100 Dallas, TX 75244 www.ncspa.org	972/850-1907
NCMA	National Concrete Masonry Association 13750 Sunrise Valley Drive Herndon, VA 20171-4662 www.ncma.org	703/713-1900
NEBB	National Environmental Balancing Bureau 8575 Grovemont Circle Gaithersburg, MD 20877 www.nebb.org	301/977-3698
NECA	National Electrical Contractors Association 1201 Pennsylvania Ave. NW Washington, D.C., 20004 www.necanet.org	202/991-6300
NEMA	National Electrical Manufacturers Association 1300 North 17th Street N, Suite 900 Rosslyn, VA 22209 www.nema.org	703/841-3200
NEII	National Elevator Industry, Inc. 5537 SW Urish Road Topeka, KS 66610 https://nationalelevatorindustry.org/	703/589-9985
NFPA	National Fire Protection Association 1 Batterymarch Park Quincy, MA 02169-7471 www.nfpa.org	800/344-3555 855/274-8525

NGA (formerly GANA)	National Glass Association (merged with Glass Association of North America) 1945 Old Gallows Road Suite 750 Vienna, VA 22182 www.glass.org	866/342-5642 Ext 127
NHLA	National Hardwood Lumber Association PO Box 34518 Memphis, TN 38184 www.nhla.com	901/377-1818
NIA	National Insulation Association 516 Herndon Pkwy., Ste. D Herndon, VA 20170 www.insulation.org	703/464-6422
NRCA	National Roofing Contractors Association 10255 W. Higgins Road, Suite 600 Rosemont, IL 60018-5607 www.nrca.net	847/299-9070
NSF	NSF International 789 N. Dixboro Road Ann Arbor, MI 48113-0140 www.nsf.org	800/673-6275 734/769-8010
NSI	Natural Stone Institute (formerly Marble Institute of America) 380 E. Lorain St. Oberlin, OH 44074 https://www.naturalstoneinstitute.org/	440/250-9222
NTMA	National Terrazzo and Mosaic Association 209 N. Crockett Street, Suite 2 PO Box 2605 Fredericksburg, TX 78624 www.ntma.com	800/323-9736
OSHA	Occupational Safety and Health Act U.S. Department of Labor Occupational Safety & Health Administration 200 Constitution Ave., NW Washington, DC 20210 www.osha.gov	800/321-OSHA (6742)

PCA	Portland Cement Association 5420 Old Orchard Road Skokie, IL 60077 or 200 Massachusetts Ave NW, Suite 200 Washington, DC 20001 www.cement.org	847/966-6200 202/408-9494
PCA	Painting Contractors Association (formerly Painting and Decorating Contractors of America) 2316 Millpark Drive Maryland Heights, MO 63043 https://www.pcapainted.org/	800/322-7322
PCI	Precast/Prestressed Concrete Institute 8770 W. Bryn Mawr Ave., Suite 1150 Chicago, IL 60631 www.pci.org	312/786-0300
PDI	Plumbing & Drainage Institute 800 Turnpike Street, Suite 300 North Andover, MA 01845 http://pdionline.org	978/557-0720 800/589-8956
PEI	Porcelain Enamel Institute, Inc. P.O. Box 920220 Norcross, GA 30010 www.porcelainenamel.com	770/676-9366
PG&E	Pacific Gas & Electric Company P.O. Box 997300 Sacramento, CA 95899-7300 www.pge.com	800/743-5000
PLIB	Pacific Lumber Inspection Bureau (formerly West Coast Lumber Inspection Bureau) 1010 South 336th Street, Suite 210 Federal Way, WA 98003-7394 https://www.plib.org/	253/835-3344
RFCI	Resilient Floor Covering Institute 115 Broad Street, Suite 201 La Grange, GA 30240 www.rfci.com	706/882-3833
SDI	Steel Deck Institute P.O. Box 426 Glenshaw, PA 15116 www.sdi.org	412/487-3325

SDI	Steel Door Institute 30200 Detroit Road Westlake, OH 44145 www.steeldoor.org	440/899-0010
SJI	Steel Joist Institute 140 West Evans Street, Suite 203 Florence, SC 29501 http://steeljoist.org	843/407-4091
SMA	Stucco Manufacturers Association 5753 E Santa Ana Cyn Rd, #G-156 Anaheim, CA 92807 www.stuccomfgassoc.com	714/473-9579
SMACNA	Sheet Metal and Air Conditioning Contractors' National Association 4201 Lafayette Center Drive Chantilly, VA 20151-1219 www.smacna.org	703/803-2980
SPI	SPI: The Plastics Industry Trade Association, Inc. 1425 K St. NW, Suite 500 Washington, DC 20005 www.plasticsindustry.org	202/974-5200
TCA	The Tile Council of North America 100 Clemson Research Blvd. Anderson, SC 29625 www.tcnatile.com	864/646-8453
TPI	Truss Plate Institute 2670 Crain Highway, Suite 203 Waldorf, MD 20601 www.tpinst.org	240/587-5582
TPI	Turfgrass Producers International 444 E. Roosevelt Road #346 Lombard, IL 60148 www.turfgrasssod.org	800/405-8873 847/649-5555
TCIA	Tree Care Industry Association (formerly the National Arborist Association) 670 N Commercial Street, Suite 201 Manchester, NH 03101 www.tcia.org	603/314-5380 800/733-2622

TVI	The Vermiculite Institute c/o The Schundler Company 10 Central Street Nahant, MA 01908 www.vermiculiteinstitute.org	732/287-2244
UL	Underwriters Laboratories Inc. 333 Pfingsten Road Northbrook, IL 60062-2096 www.ul.com	847/272-8800 877/854-3577
UNI	Uni-Bell PVC Pipe Association 201 E. John Carpenter Freeway, Suite 750 Irving, TX 75062 www.uni-bell.org	972/243-3902
USDA	U.S. Department of Agriculture 1400 Independence Ave., S.W. Washington, DC 20250 www.usda.gov	202/720-2791
WA	Wallcoverings Association 35 E Wacker Dr., Suite 850 Chicago, IL 60601 www.wallcoverings.org	312/224-2574
WCMA	Window Covering Manufacturers Association 355 Lexington Avenue 15th Floor New York, NY 10017 www.wcmanet.org	212/297-2122
WDMA	Window & Door Manufacturers Association 2001 K Street NW, 3rd Floor North Washington, D.C. 20006 www.wdma.com	202/367-1157
WI	Woodwork Institute 1455 Response Road, Suite 110 Sacramento, CA 95815 www.wicnet.org	916/372-9943
WRI	Wire Reinforcement Institute 942 Main Street, Suite 300 Hartford, CT 06103 www.wirereinforcementinstitute.org	860/240-9545
WWCA	Western Wall & Ceiling Contractors Association 1910 N. Lime St. Orange, CA 92865 www.wwcca.org	714/221-5520

WWPA	Western Wood Products Association (formerly Redwood Inspection Service) 1500 SW First Ave., Suite 870 Portland, OR 97201 www.wwpa.org	503/224-3930
------	--	--------------

PART 2 - PRODUCTS Not Used.

PART 3 - EXECUTION Not Used.

END OF DOCUMENT

MATERIALS AND EQUIPMENT

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Purchase of Materials and Equipment;
- B. Special Conditions;
- C. Imported Materials Certification.

1.02 MATERIAL AND EQUIPMENT

- A. Only items approved by the District and/or Design Professional shall be used.
- B. Contractor shall submit lists of products and other product information in accordance with the Contract Documents, including, without limitation, the provisions regarding the submittals.

1.03 MATERIAL AND EQUIPMENT COLORS

- A. The District and/or Architect will provide a schedule of colors.
- B. No individual color selections will be made until after approval of all pertinent materials and equipment and after receipt of appropriate samples in accordance with the Contract Documents, including, without limitation, the provisions regarding the submittals.
- C. Contractor shall request priority in writing for any item requiring advance ordering to maintain the approved Construction Schedule.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. Contractor shall deliver manufactured materials in original packages, containers, or bundles (with seals unbroken), bearing name or identification mark of manufacturer.
- B. Contractor shall deliver fabrications in as large assemblies as practicable; where specified as shop-primed or shop-finished, package or crate as required to preserve such priming or finish intact and free from abrasion.
- C. Contractor shall store materials in such a manner as necessary to properly protect them from damage. Materials or equipment damaged by handling, weather, dirt, or from any other cause will not be accepted.

- D. Materials are not acceptable that have been warehoused for long periods of time, stored or transported in improper environment, improperly packaged, inadequately labeled, poorly protected, excessively shipped, deviated from normal distribution pattern, or reassembled.
- E. Contractor shall store material so as to cause no obstructions of sidewalks, roadways, access to the Site or buildings, and underground services. Contractor shall protect material and equipment furnished under Contract.
- F. Contractor may store materials on Site with prior written approval by the District, all material shall remain under Contractor's control and Contractor shall remain liable for any damage to the materials. Should the Project Site not have storage area available, the Contractor shall provide for off-site storage at a bonded warehouse and with appropriate insurance coverage at no cost to District.
- G. When any room in Project is used as a shop or storeroom, the Contractor shall be responsible for any repairs, patching, or cleaning necessary due to that use. Location of storage space shall be subject to prior written approval by District.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Manufacturers listed in various sections of Contract Documents are names of those manufacturers that are believed to be capable of supplying one or more of items specified therein.
- B. The listing of a manufacturer does not imply that every product of that manufacturer is acceptable as meeting the requirements of the Contract Documents.

2.02 FACILITIES AND EQUIPMENT

Contractor shall provide, install, maintain, and operate a complete and adequate facility for handling, the execution, disposal, and distribution of material and equipment as required for proper and timely performance of Work connected with Contract.

2.03 MATERIAL REFERENCE STANDARDS

Where material is specified solely by reference to "standard specifications" and if requested by District, Contractor shall submit for review data on actual material proposed to be incorporated into Work of Contract listing name and address of vendor, manufacturer, or producer, and trade or brand names of those materials, and data substantiating compliance with standard specifications.

PART 3 - EXECUTION

3.01 WORKMANSHIP

- A. Where not more specifically described in any other Contract Documents, workmanship shall conform to methods and operations of best standards and accepted practices of trade or trades involved and shall include items of fabrication, construction, or installation regularly furnished or required for completion (including finish and for successful operation, as intended).
- B. Work shall be executed by tradespersons skilled in their respective lines of Work. When completed, parts shall have been durably and substantially built and present a neat appearance.

3.02 COORDINATION

- A. Contractor shall coordinate installation of Work so as to not interfere with installation of others. Adjustment or rework because of Contractor's failure to coordinate will be at no additional cost to District.
- B. Contractor shall examine in-place work for readiness, completeness, fitness to be concealed or to receive other work, and in compliance with Contract Documents. Concealing or covering Work constitutes acceptance of additional cost which will result should in-place Work be found unsuitable for receiving other Work or otherwise deviating from the requirements of the Contract Documents.

3.03 COMPLETENESS

Contractor shall provide all portions of the Work, unless clearly stated otherwise, installed complete and operational with all elements, accessories, anchorages, utility connections, etc., in manner to assure well-balanced performance, in accordance with manufacturer's recommendations and by Contract Documents. Terms such as "installed complete," "operable condition," "for use intended," "connected to all utilities," "terminate with proper cap," "adequately anchored," "patch and refinish," "to match similar," should be assumed to apply in all cases, except where completeness of functional or operable condition is specifically stated as not required.

3.04 APPROVED INSTALLER OR APPLICATOR

Installation by a manufacturer's approved installer or applicator is an understood part of Specifications and only approved installer or applicator is to provide on-site Work where specified manufacturer has on-going program of approving (i.e. certifying, bonding, re-warranting) installers or applicators. Newly established relationships between a manufacturer and an installer or applicator who does not have other approved applicator work in progress or completed is not approved for this Project.

3.05 MANUFACTURER'S RECOMMENDATIONS

All installations shall be in accordance with manufacturer's published recommendations and specific written directions of manufacturer's representative.

Should Contract Documents differ from recommendations of manufacturer or directions of his representative, Contractor shall analyze differences, make recommendations to the District and the Architect in writing, and shall not proceed until interpretation or clarification has been issued by the District and/or the Architect.

END OF DOCUMENT

QUALITY CONTROL

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Inspector, Inspections and Tests, Uncovering of Work and Non-conforming of Work and Correction of Work;
- B. Special Conditions.

1.02 RELATED CODES:

- A. The Work is governed by requirements of Title 24, California Code of Regulations ("CCR"), and the Contractor shall keep a copy of these available at the job Site for ready reference during construction.
- B. The Division of the State Architect ("DSA") shall be notified at or before the start of construction.

1.03 OBSERVATION AND SUPERVISION:

- A. The District and Architect or their appointed representatives will review the Work and the Contractor shall provide facilities and access to the Work at all times as required to facilitate this review. Administration by the Architect and any consulting Structural Engineer will be in accordance with applicable regulations, including, without limitation, CCR, Part 1, Title 24, Section 4-341.
- B. One or more Project Inspector(s) approved by DSA and employed by or in contract with the District, referred to hereinafter as the "Project Inspector", will observe the work in accordance with CCR, Part 1, Title 24, Sections 4-333(b) and 4-342:
 - (1) The Project Inspector and Special Inspector(s) shall have access to the Work wherever it is in preparation or progress for ascertaining that the Work is in accordance with the Contract Documents and all applicable code sections. The Contractor shall provide facilities and operation of equipment as needed, and access as required and shall provide assistance for sampling or measuring materials.
 - (2) The Project Inspector will notify the District and Architect and call the attention of the Contractor to any observed failure of Work or material to conform to Contract Documents.

The Contractor shall conform with all applicable laws as indicated in the Contract Documents, including, without limitation, to CCR, Part 1, Title 24, Section 4-343.

The Contractor shall supervise and direct the Work and maintain a competent superintendent on the job who is authorized to act in all matters pertaining to the Work. The Contractor's superintendent shall also inspect all materials, as they arrive, for compliance with the Contract Documents. Contractor shall reject defective Work or materials immediately upon delivery or failure of the Work or material to comply with the Contract Documents. The Contractor shall submit verified reports as indicated in the Contract Documents, including, without limitation, the Specifications and as required by Part 1, Title 24, Section 4-336.

1.04 TESTING AGENCIES:

- A. Testing agencies and tests shall be in conformance with the General Documents and the requirements of Part 1, Title 24, Section 4- 335.
- B. Testing and inspection in connection with earthwork shall be under the direction of the District's consulting soils engineer, if any, referred to hereinafter as the "Soils Engineer."
- C. Testing and inspection of construction materials and workmanship shall be performed by a qualified laboratory, referred to hereinafter as the "Testing Laboratory." The Testing Laboratory shall be under direction of an engineer registered in the State of California, shall conform to requirements of ASTM E329, and shall be employed by or in contract with the District.
- D. Testing laboratory shall be approved by the Architect and the Division of the State Architect.
- E. Owner will employ and pay for services of an independent testing labatory to perform specified inspection and testing. Retesting cost for failed test will be Contractors responsibilityand will be back-charged against the contract.

1.05 TESTS AND INSPECTIONS:

- A. The Contractor shall be responsible for notifying the District and Project Inspector of all required tests and inspections. Contractor shall notify the District and Project Inspector at least seventy-two hours (72) hours in advance of performing any Work requiring testing or inspection.
- B. The Contractor shall provide access to Work to be tested and furnish incidental labor, equipment, and facilities to facilitate all inspections and tests.
- C. The District will pay for first inspections and tests required by the "CCR", and other inspections or tests that the District and/or the Architect may direct to have made, including the following principal items:
 - (1) Tests and observations for earthwork and paving.
 - (2) Tests for concrete mix designs, including tests of trial batches.
 - (3) Tests and inspections for structural steel work.
 - (4) Field tests for framing lumber moisture content.

- (5) Additional tests directed by the District that establish that materials and installation comply with the Contract Documents.
 - (6) Tests and observations of welding and expansion anchors.
- D. The District may at its discretion, pay and then back charge the Contractor for:
 - (1) Retests or reinspections, if required, and tests or inspections required due to Contractor error or lack of required identifications of material.
 - (2) Uncovering of work in accordance with Contract Documents.
 - (3) Testing done on weekends, holidays, and overtime will be chargeable to the Contractor for the overtime portion.
 - (4) Testing done off Site.
- E. Testing and inspection reports and certifications:
 - (1) If initially received by Contractor, Contractor shall provide to each of the following a copy of the agency or laboratory report of each test or inspection or certification.
 - (a) The District;
 - (b) The Construction Manager, if any;
 - (c) The Architect;
 - (d) The Consulting Engineer, if any;
 - (e) Other engineers on the Project, as appropriate;
 - (f) The Project Inspector; and
 - (g) The Contractor.
 - (2) When the test or inspection is one required by the CCR, a copy of the report shall also be provided to the DSA.

1.06 LABORATORY REPORTS

- A. After each inspection and test, promptly submit two copies of laboratory report to Owner, Architect, Contractor and DSA.
- B. Include:
 - (1) Date of issue,
 - (2) DSA Application and File numbers,
 - (3) Project title and number,

- (4) Name of inspector,
 - (5) Date and time of sampling or inspection,
 - (6) Identification of product and Specification Section,
 - (7) Location in the Project,
 - (8) Type of inspection or test,
 - (9) Date of test,
 - (10) Results of test,
 - (11) Conformance with Contract Documents.
- C. When requested by Architect, provide interpretation of test results.

1.07 LIMITS ON TESTING LABORATORY AUTHORITY

- A. Laboratory may not release, revoke, alter or enlarge on requirements of Contract Documents.
- B. Laboratory may not approve or accept any portion of the work.
- C. Laboratory may not assume any duties of Contractor.
- D. Laboratory has no authority to stop the work.

PART 2 - PRODUCTS

2.01 TYPE OF TEST AND INSPECTIONS

- A. Testing and inspection shall be in accordance with DSA Form 103 (or current version)
- B. Slump Test
ASTM C 143
- C. Concrete Tests

Testing agency shall test concrete used in the work per the following paragraphs:

- (1) Compressive Strength:
 - (a) Minimum number of tests required: One (1) set of three (3) cylinders for each 100 cubic yards (Sec. 2604(h) 01) of concrete or major fraction thereof, placed in one (1) day. See Title 24, Section 2605(g).

- (b) Two cylinders of each set shall be tested at twenty-eight (28) days. One (1) cylinder shall be held in reserve and tested only when directed by the Architect or District.
- (c) Concrete shall test the minimum ultimate compressive strength in twenty-eight 28 days, as specified on the structural drawings.
- (d) In the event that the twenty-eight (28) day test falls below the minimum specified strength, the effective concrete in place shall be tested by taking cores in accordance with UBC Standard No. 26-13 and tested as required for cylinders.
- (e) In the event that the test on core specimens falls below the minimum specified strength, the concrete will be deemed defective and shall be removed and replaced upon such direction of the Architect, and in a manner acceptable to the Division of the State Architect.

D. Reinforcing, Steel

PART 3 - EXECUTION Not Used.

END OF DOCUMENT

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Requirements for Testing Laboratory.
 - 2. Contractor's responsibilities for facilitation of Testing and Inspections.

1.2 RELATED SECTIONS AND DOCUMENTS

- A. Geologic Hazards & Soils Report.
- B. DSA 103 - Structural Test & Inspections List.
- C. Section 31 0000, Earthwork.
- D. Individual Specification Sections: Inspections and tests required, and standards for testing.

1.3 REFERENCES

- A. California Administrative Code (CAC), edition as noted on the drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Building Code (CBC), edition as noted on the drawings, as adopted by the California Division of the State Architect (DSA).

1.4 SELECTION AND PAYMENT

- A. Testing laboratory shall be approved by both the Architect and the Division of the State Architect.
- B. Owner will employ and pay for services of an independent testing laboratory to perform specified inspection and testing. Retesting costs for failed tests will be the Contractors responsibility and will be back-charged against the contract.
- C. Under provisions for Relocatable Building construction, Owner limits his exposure to in-plant inspection and testing costs. Refer to other Specification Sections related to such specific construction.
- D. Employment of testing laboratory shall in no way relieve Contractor of obligation to perform work in accordance with requirements of Contract Documents.

1.5 LABORATORY REPORTS

- A. After each inspection and test, promptly submit two copies of laboratory report to Owner, Architect, Contractor and DSA.
- B. Include:

TESTING AND INSPECTION SERVICES

SECTION 01 4523

3595001

1. Date of issue,
2. DSA Application and File numbers,
3. Project title and number,
4. Name of inspector,
5. Date and time of sampling or inspection,
6. Identification of product and Specification Section,
7. Location in the Project,
8. Type of inspection or test,
9. Date of test,
10. Results of test,
11. Conformance with Contract Documents.

C. When requested by Architect, provide interpretation of test results.

1.6 LIMITS ON TESTING LABORATORY AUTHORITY

- A. Laboratory may not release, revoke, alter or enlarge on requirements of Contract Documents.
- B. Laboratory may not approve or accept any portion of the work.
- C. Laboratory may not assume any duties of Contractor.
- D. Laboratory has no authority to stop the work.

1.7 CONTRACTOR RESPONSIBILITIES

- A. Deliver to laboratory at designated location, adequate samples of materials proposed to be used which require testing, along with proposed mix designs. Allow reasonable time for review and testing.
- B. Arrange for, and coordinate with, laboratory for all required testing and inspection. Provide adequate notice, in advance, for proper scheduling and processing of testing. The Inspector will not be responsible for scheduling or arranging for testing and inspection services.
- C. Cooperate with laboratory personnel, and provide access to the work and to manufacturer's facilities.
- D. Provide incidental labor and facilities to provide access to work to be tested, to obtain and handle samples at the site or at the source of products to be tested, to facilitate tests and inspections, storage and curing of test samples.
- E. Notify Architect, Inspector, Structural Engineer (when applicable) and laboratory 24 hours prior to expected time for operations requiring inspection and testing services.

END OF SECTION

TEMPORARY FACILITIES AND CONTROLS

PART 1 – GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions;
- B. Special Conditions;
- C. Site Standards; and
- D. Construction Waste Management and Disposal.

1.02 TEMPORARY UTILITIES:

- A. Electric Power and Lighting:
 - (1) Contractor will pay for power during the course of the Work. To the extent power is available in the building(s) or on the Site, Contractor may use the District's existing utilities by making prearranged payments to the District for the utilities used by Contractor and all Subcontractors. Contractor shall be responsible for providing temporary facilities required to deliver that power service from its existing location in the building(s) or on the Site to point of intended use.
 - (2) Contractor shall verify characteristics of power available in building(s) or on the Site. Contractor shall take all actions required to make modifications where power of higher voltage or different phases of current are required. Contractor shall be fully responsible for providing that service and shall pay all costs required therefor.
 - (3) Contractor shall furnish, wire for, install, and maintain temporary electrical lights wherever it is necessary to provide illumination for the proper performance and/or observation of the Work: a minimum of 20 foot-candles for rough work and 50 foot-candles for finish work.
 - (4) Contractor shall be responsible for maintaining existing lighting levels in the project vicinity should temporary outages or service interruptions occur.
- B. Water:
 - (1) Contractor shall pay for water used during the course of the Work. Contractor shall coordinate and pay for installation or use of water meter in compliance with local water agency requirements. To the

extent water is then available in the building(s) or on the Site, Contractor may use the District's existing utilities by making prearranged payments to the District for the utilities used by Contractor and all Subcontractors. Contractor shall be responsible for providing temporary facilities required to deliver such utility service from its existing location in the building(s), on the Site, or other location approved by the local water agency, to point of intended use.

- (2) Contractor shall use backflow preventers on water lines at point of connection to District's water supply. Backflow preventers shall comply with requirements of Uniform Plumbing Code.
- (3) Contractor shall make potable water available for human consumption.

C. Sanitary Facilities:

- (1) Contractor shall provide sanitary temporary facilities in no fewer numbers than required by law and such additional facilities as may be directed by the Inspector for the use of all workers. The facilities shall be maintained in a sanitary condition at all times and shall be left at the Site until removal is directed by the Inspector or Contractor completes all other work at the Site.
- (2) Use of toilet facilities in the Work under construction shall not be permitted except by consent of the Inspector and the District.

D. Fire Protection:

- (1) Contractor shall provide and maintain fire extinguishers and other equipment for fire protection. Such equipment shall be designated for use for fire protection only and shall comply with all requirements of the California Fire, State Fire Marshall and/or its designee.
- (2) Where on-site welding and burning of steel is unavoidable, Contractor shall provide protection for adjacent surfaces.

E. Trash Removal:

- (1) Contractor shall provide trash removal on a timely basis. Under no circumstance shall Contractor use District trash service.

F. Field Office:

- (1) If Contractor chooses to provide a field office, it shall be an acceptable construction trailer that is well-lit and ventilated. The construction trailer shall be equipped with shelves, desks, filing cabinet, chairs, and such other items of equipment needed. Trailer and equipment are the property of the Contractor and must be removed from the Site upon completion of the Work.
- (2) Contractor shall provide any additional electric lighting and power required for the trailer. Contractor shall make adequate provisions for heating and cooling as required.

1.03 CONSTRUCTION AIDS:

- A. Plant and Equipment:
 - (1) Contractor shall furnish, operate, and maintain a complete plant for fabricating, handling, conveying, installing, and erecting materials and equipment; and for conveyances for transporting workers. Include elevators, hoists, debris chutes, and other equipment, tools, and appliances necessary for performance of the Work.
 - (2) Contractor shall maintain plant and equipment in safe and efficient operating condition. Damages due to defective plant and equipment, and uses made thereof, shall be repaired by Contractor at no expense to the District.
- B. None of the District's tools and equipment shall be used by Contractor for the performance of the Work.

1.04 BARRIERS AND ENCLOSURES:

- A. Contractor shall obtain the District's written permission for locations and types of temporary barriers and enclosures, including fire-rated materials proposed for use, prior to their installation.
- B. Contractor shall provide and maintain temporary enclosures to prevent public entry and to protect persons using other buildings and portions of the Site and/or Premises, the public, and workers. Contractor shall also protect the Work and existing facilities from the elements, and adjacent construction and improvements, persons, and trees and plants from damage and injury from demolition and construction operations.
- C. Contractor shall provide site access to existing facilities for persons using other buildings and portions of the Site, the public, and for deliveries and other services and activities.
- D. Tree and Plant Protection:
 - (1) Contractor shall preserve and protect existing trees and plants on the Premises that are not designated or required to be removed, and those adjacent to the Premises.
 - (2) Contractor shall provide barriers to a minimum height of 4'-0" around drip line of each tree and plant, around each group of trees and plants, as applicable, in the proximity of demolition and construction operations, or as denoted on the Plans.
 - (3) Contractor shall not park trucks, store materials, perform Work or cross over landscaped areas. Contractor shall not dispose of paint thinners, water from cleaning, plastering or concrete operations, or other deleterious materials in landscaped areas, storm drain systems, or sewers. Plant materials damaged as a result of the performance of the Work shall, at the option of the District and at Contractor's expense, either be replaced with new plant materials equal in size to

those damaged or by payment of an amount representing the value of the damaged materials as determined by the District.

- (4) Contractor shall remove soil that has been contaminated during the performance of the Work by oil, solvents, and other materials which could be harmful to trees and plants, and replace with good soil, at Contractor's expense.
- (5) Excavation around Trees:
 - (a) Excavation within drip lines of trees shall be done only where absolutely necessary and with written permission from the District.
 - (b) Where trenching for utilities is required within drip lines, tunneling under and around roots shall be by hand digging and shall be approved by the District. Main lateral roots and taproots shall not be cut. All roots 2 inches in diameter and larger shall be tunneled under and heavily wrapped with wet burlap so as to prevent scarring or excessive drying. Smaller roots that interfere with installation of new work may be cut with prior approval by the District. Roots must first be cut with a Vermeer, or equivalent, root cutter prior to any trenching.
 - (c) Where excavation for new construction is required within drip line of trees, hand excavation shall be employed to minimize damage to root system. Roots shall be relocated in backfill areas wherever possible. If encountered immediately adjacent to location of new construction, roots shall be cut approximately 6 inches back from new construction.
 - (d) Approved excavations shall be carefully backfilled with the excavated materials approved for backfilling. Backfill shall conform to adjacent grades without dips, sunken areas, humps, or other surface irregularities. Do not use mechanical equipment to compact backfill. Tamp carefully using hand tools, refilling and tamping until Final Acceptance as necessary to offset settlement.
 - (e) Exposed roots shall not be allowed to dry out before permanent backfill is placed. Temporary earth cover shall be provided, or roots shall be wrapped with four layers of wet, untreated burlap and temporarily supported and protected from damage until permanently relocated and covered with backfill.
 - (f) Accidentally broken roots should be sawed cleanly 3 inches behind ragged end.

1.05 SECURITY:

The Contractor shall be responsible for project security for materials, tools, equipment, supplies, and completed and partially completed Work.

1.06 TEMPORARY CONTROLS:

A. Noise Control:

- (1) Contractor acknowledges that adjacent facilities may remain in operation during all or a portion of the Work period, and it shall take all reasonable precautions to minimize noise as required by applicable laws and the Contract Documents.
- (2) Notice of proposed noisy operations, including without limitation, operation of pneumatic demolition tools, concrete saws, and other equipment, shall be submitted to the District a minimum of forty-eight (48) hours in advance of their performance.

B. Noise and Vibration:

- (1) Equipment and impact tools shall have intake and exhaust mufflers.
- (2) Contractor shall cooperate with District to minimize and/or cease the use of noisy and vibratory equipment if that equipment becomes objectionable by its longevity.

C. Dust and Dirt:

- (1) Contractor shall conduct demolition and construction operations to minimize the generation of dust and dirt, and prevent dust and dirt from interfering with the progress of the Work and from accumulating in the Work and adjacent areas including, without limitation, occupied facilities.
- (2) Contractor shall periodically water exterior demolition and construction areas to minimize the generation of dust and dirt.
- (3) Contractor shall ensure that all hauling equipment and trucks carrying loads of soil and debris shall have their loads sprayed with water or covered with tarpaulins, and as otherwise required by local and state ordinance.
- (4) Contractor shall prevent dust and dirt from accumulating on walks, roadways, parking areas, and planting, and from washing into sewer and storm drain lines.

D. Water:

- (1) Contractor shall not permit surface and subsurface water, and other liquids, to accumulate in or about the vicinity of the Premises. Should accumulation develop, Contractor shall control the water or other liquid, and suitably dispose of it by means of temporary pumps, piping, drainage lines, troughs, ditches, dams, or other methods.

E. Pollution:

- (1) No burning of refuse, debris, or other materials shall be permitted on or in the vicinity of the Premises.
- (2) Contractor shall comply with applicable regulatory requirements and anti-pollution ordinances during the conduct of the Work including, without limitation, demolition, construction, and disposal operations.

F. Lighting:

- (1) If portable lights are used after dark, all light must be located so as not to direct light into neighboring property.

1.07 PUBLICITY RELEASES:

- A. Contractor shall not release any information, story, photograph, plan, or drawing relating information about the Project to anyone, including press and other public communications medium, including, without limitation, on website(s) without the written permission of the District.

PART 2 – PRODUCTS Not used.

PART 3 – EXECUTION Not used.

END OF DOCUMENT

CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions;
- B. Special Conditions; and
- C. Temporary Facilities and Controls.

1.02 SECTION INCLUDES:

- A. Administrative and procedural requirements for the following:
 - (1) Salvaging non-hazardous construction waste.
 - (2) Recycling non-hazardous construction waste.
 - (3) Disposing of non-hazardous construction waste.

1.03 DEFINITIONS:

- A. Construction Waste: Building and site improvement materials and other solid waste resulting from construction, remodeling, renovation, or repair operations. Construction waste includes packaging.
- B. Demolition Waste: Building and site improvement materials resulting from demolition or selective demolition operations.
- C. Disposal: Removal off-site of demolition and construction waste and subsequent sale, recycling, reuse, or deposit in landfill or incinerator acceptable to authorities having jurisdiction.
- D. Recycle: Recovery of demolition or construction waste for subsequent processing in preparation for reuse.
- E. Salvage: Recovery of demolition or construction waste and subsequent sale or reuse in another facility.
- F. Salvage and Reuse: Recovery of demolition or construction waste and subsequent incorporation into the Work.

1.04 PERFORMANCE REQUIREMENTS:

- A. General: Develop waste management plan that results in end-of Project rates for salvage/recycling of sixty-five percent (65%) by weight (or by volume, but not a combination) of total waste generated by the Work.

1.05 SUBMITTALS:

- A. Waste Management Plan: Submit waste management plan within 30 days of date established for commencement of the Work.
- B. Waste Reduction Progress Reports: Concurrent with each Application for Payment, submit copies of report. Include the following information:
 - (1) Material category.
 - (2) Generation point of waste.
 - (3) Total quantity of waste in tons or cubic yards.
 - (4) Quantity of waste salvaged, both estimated and actual in tons or cubic yards.
 - (5) Quantity of waste recycled, both estimated and actual in tons or cubic yards.
 - (6) Total quantity of waste recovered (salvaged plus recycled) in tons or cubic yards.
 - (7) Total quantity of waste recovered (salvaged plus recycled) as a percentage of total waste.
- C. Waste Reduction Calculations: Before request for final payment, submit copies of calculated end-of-Project rates for salvage, recycling, and disposal as a percentage of total waste generated by the Work.
- D. Records of Donations: Indicate receipt and acceptance of salvageable waste donated to individuals and organizations. Indicate whether organization is tax exempt.
- E. Records of Sales: Indicate receipt and acceptance of salvageable waste sold to individuals and organizations. Indicate whether organization is tax exempt.
- F. Recycling and Processing Facility Records: Indicate receipt and acceptance of recyclable waste by recycling and processing facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.
- G. Landfill and Incinerator Disposal Records: Indicate receipt and acceptance of waste by landfills and incinerator facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.

- H. Qualification Data: For Waste Management Coordinator.
- I. Submittal procedures and quantities are specified in Document 01 33 00.

1.06 QUALITY ASSURANCE:

- A. Waste Management Coordinator Qualifications: LEED Accredited Professional by U.S. Green Building Council.
- B. Regulatory Requirements: Comply with hauling and disposal regulations of authorities having jurisdiction.
- C. Waste Management Conference: Conduct conference at Project site to comply with requirements. Review methods and procedures related to waste management including, but not limited to, the following:
 - (1) Review and discuss waste management plan including responsibilities of Waste Management Coordinator.
 - (2) Review requirements for documenting quantities of each type of waste and its disposition.
 - (3) Review and finalize procedures for materials separation and verify availability of containers and bins needed to avoid delays.
 - (4) Review procedures for periodic waste collection and transportation to recycling and disposal facilities.
 - (5) Review waste management requirements for each trade.

1.07 WASTE MANAGEMENT PLAN:

- A. General: Develop plan consisting of waste identification, waste reduction work plan, and cost/revenue analysis. Indicate quantities by weight or volume, but use same units of measurement throughout waste management plan.
- B. Waste Identification: Indicate anticipated types and quantities of site-clearing and construction waste generated by the Work. Include estimated quantities and assumptions for estimates.
- C. Waste Reduction Work Plan: List each type of waste and whether it will be salvaged, recycled, or disposed of in landfill or incinerator. Include points of waste generation, total quantity of each type of waste, quantity for each means of recovery, and handling and transportation procedures.
 - (1) Salvaged Materials for Reuse: For materials that will be salvaged and reused in this Project, describe methods for preparing salvaged materials before incorporation into the Work.

- (2) Salvaged Materials for Sale: For materials that will be sold to individuals and organizations, include list of their names, addresses, and telephone numbers.
- (3) Salvaged Materials for Donation: For materials that will be donated to individuals and organizations, include list of their names, addresses, and telephone numbers.
- (4) Recycled Materials: Include list of local receivers and processors and type of recycled materials each will accept. Include names, addresses, and telephone numbers.
- (5) Disposed Materials: Indicate how and where materials will be disposed of. Include name, address, and telephone number of each landfill and incinerator facility.
- (6) Handling and Transportation Procedures: Include method that will be used for separating recyclable waste including sizes of containers, container labeling, and designated location on Project site where materials separation will be located.

PART 2 - PRODUCTS Not Used.

PART 3 - EXECUTION

3.01 PLAN IMPLEMENTATION:

- A. General: Implement approved waste management plan. Provide handling, containers, storage, signage, transportation, and other items as required to implement waste management plan during the entire duration of the Contract.
 - (1) Comply with Document 01 50 00 for operation, termination, and removal requirements.
- B. Training: Train workers, subcontractors, and suppliers on proper waste management procedures, as appropriate for the Work occurring at Project site.
 - (1) Distribute waste management plan to everyone concerned within 3 days of submittal return.
 - (2) Distribute waste management plan to entities when they first begin work on site. Review plan procedures and locations established for salvage, recycling, and disposal.
- C. Site Access and Temporary Controls: Conduct waste management operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.

- (1) Designate and label specific areas of Project site necessary for separating materials that are to be salvaged, recycled, reused, donated, and sold.
- (2) Comply with Document 01 50 00 for controlling dust and dirt, environmental protection, and noise control.

3.02 RECYCLING CONSTRUCTION WASTE:

- A. General: Recycle paper and beverage containers used by on-site workers.
- B. Recycling Incentives: Revenues, savings, rebates, tax credits, and other incentives received for recycling waste materials shall accrue to the Contractor.
- C. Procedures: Separate recyclable waste from other waste materials, trash, and debris. Separate recyclable waste by type at Project site to the maximum extent practical.
 - (1) Provide appropriately marked containers or bins for controlling recyclable waste until they are removed from Project Site. Include list of acceptable and unacceptable materials at each container and bin.
 - (a) Inspect containers and bins for contamination and remove contaminated materials if found.
 - (2) Stockpile processed materials on site without intermixing with other materials. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
 - (3) Stockpile materials away from construction area. Do not store within drip line of remaining trees.
 - (4) Store components off the ground and protect from the weather.
 - (5) Remove recyclable waste off District property and transport to recycling receiver or processor.
- D. Packaging:
 - (1) Cardboard and Boxes: Break down packaging into flat sheets. Bundle and store in a dry location.
 - (2) Polystyrene Packaging: Separate and bag material.
 - (3) Pallets: As much as possible, require deliveries using pallets to remove pallets from Project Site. For pallets that remain on Site, break down pallets into component wood pieces and comply with requirements for recycling wood.
 - (4) Crates: Break down crates into component wood pieces and comply with requirements for recycling wood.

- E. Site-Clearing Wastes: Chip brush, branches, and trees on site.
- F. Wood Materials:
 - (1) Clean Cut-Offs of Lumber: Grind or chip into small pieces.
 - (2) Clean Sawdust: Bag sawdust that does not contain painted or treated wood.

3.03 DISPOSAL OF WASTE:

- A. General: Except for items or materials to be salvaged, recycled, or otherwise reused, remove waste materials from Project Site and legally dispose of them in a landfill or incinerator acceptable to authorities having jurisdiction.
 - (1) Except as otherwise specified, do not allow waste materials that are to be disposed of accumulate on site.
 - (2) Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
- B. Burning: Do not burn waste materials.
- C. Disposal: Transport waste materials off District property and legally dispose of them.

END OF DOCUMENT

FIELD OFFICES

PART 1 – GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions;
- B. Special Conditions; and
- C. Temporary Facilities and Controls.

1.02 SECTION INCLUDES:

- A. Requirements for Field Offices and Field Office Trailers.

1.03 SUMMARY:

- A. General: Contractor shall provide District's Field Office Trailer and contents, for District's use exclusively, during the term of the Contract.
- B. Property: Trailer, furniture, furnishings, equipment, and the like, supplied by the Contractor with the Office Trailer shall remain the property of the Contractor; District property items installed, delivered, and the like by District within the Office Trailer will remain District's property.
- C. Modifications: District reserves the right to modify the trailer or contents, or both, as may be deemed proper by District.
- D. Condition: Trailer and contents shall be clean, neat, substantially finished, in good, proper, and safe condition for use, operation, and the like; the trailer and contents shall not be required to be new.
- E. Installation Timing: Provide safe, fully furnished, functional, proper, complete, and finished trailer properly ready for entire use, within fourteen (14) calendar days of District's notification of the issuance of Notice to Proceed.

1.04 SUBMITTALS:

- A. General: Submit submittals to District in quantity, format, type, and the like, as specified herein.
- B. Office Trailer Data: One (1) copy of manufacturer's descriptive data, technical descriptions, regulatory compliance, industry standards, installation, removal, and maintenance instructions.

- C. Equipment Data: Two (2) copies of manufacturer data for each type of equipment, if directed by District.
- D. Furniture and Furnishings Data: Two (2) copies of manufacturer data for each type of equipment, if directed by District.
- E. Plans: One (1) reproducible copy of appropriately scaled plans of trailer layout. Plans shall include, but not be limited to: lighting; furniture; equipment; telephone and electrical outlets; and the like.
- F. Product Samples: One (1) complete and entire unit of each type, if directed by District.

1.05 QUALITY ASSURANCE

- A. Standards: In the event that provisions of codes, regulations, safety orders, Contract Documents, referenced manufacturer's specifications, manufacturer's instructions, industry standards, and the like, are in conflict, the more restrictive and higher quality shall govern.
- B. Installer: Installer or Installers engaged by Contractor must have a minimum of five (5) years of documented and properly authenticated successful experience of specialization in the installation of the items or systems, or both, specified herein.
- C. Manufacturer: Contractor shall obtain products from nationally and industry recognized Manufacturer with five (5) years minimum, of immediately recent, continuous, documented and properly authenticated successful experience of specialization in the manufacture of the product specified herein.
- D. State Personnel Training: Provide proper training for maintenance and operations, including emergency procedures, and the like, as directed by District.
- E. Units: Shall be sound and free of defects, and shall not include any damage or defect that will impair the safety, installation, performance, or the durability of the entire Office Trailer and appurtenant systems.

1.06 REGULATORY REQUIREMENTS

- A. General: Work shall be executed in accordance with applicable Codes, Regulations, Statutes, Enactments, Rulings, Laws, each authority having jurisdiction, and including, but not limited to, Regulatory Requirements specified herein.
- B. California Building Standards Code ("CBSC").
- C. California Code of Regulations, Title 25, Chapter 3, Sub Chapter 2, Article 3 ("CCR").
- D. Coach Insignia: Trailer shall display California Commercial Coach Insignia; such insignia shall be deemed to show that the trailer is in accordance with the Construction and Fire Safety requirements of CCR.

PART 2 – PRODUCTS

2.01 FIELD OFFICE TRAILER

- A. General: Provide entire Field Office Trailer of type, function, operation, capacity, size, complete with controls, safety devices, accessories, and the like, for proper and durable installation. Partitions, walls, ceiling, and other interior and exterior surfaces shall be appropriately finished, including, but not limited to, trim, painting, wall base, floor covering, suspended or similar ceiling, and the like; provide systems, components, units, nuts, bolts, screws, anchoring devices, fastening devices, washers, accessories, adhesives, sealants, and other items of type, grade, and class required for the particular use, not identified but required for a complete, weather-tight, appropriately operating, and finished installation.
- B. Manufacturers: General Electric Capital Modular Space; The Space Place, Inc.; or equal.
- C. Program: Provide a wheel-mounted trailer with stairs, landings, platforms, ramps, and the like, in good, proper, safe, clean, and properly finished condition; with proper heavy duty locks, and other proper and effective security at all doors, windows, and the like. Trailer shall be maintained in good, proper, safe, clean, and properly finished condition during the Contract.
 - (1) Nominal Trailer Size: Four hundred eighty (480) square feet, minimum.
 - (2) Stairs, Platform: Properly finished stairs, platforms, and ramps.
 - (3) Doors: Two (2), three (3) foot wide exterior doors with locksets; finished ramp, steps, and entry platform at each exterior door.
 - (4) Keys: Submit five (5) keys for each door, window, furniture unit, and the like. There shall be no other key copies or originals available; each key shall be identified for District; and shall be labeled, or tagged
 - (5) Lighting: Sixty-five (65) foot-candles illumination minimum at any point, at thirty (30) inches above finished floor throughout from fluorescent light source, exclusively, or as directed by District.
 - (6) Electrical Outlets: One (1) duplex outlet evenly spaced every twelve (12) linear horizontal feet of wall face, and electrical service ready for use.

2.02 FIELD OFFICE TRAILER ITEMS

- A. General: Provide the Field Office Trailer with the following arranged into two (2) workstations:
 - (1) Desks: Two (2) desks: thirty-six (36) inches by sixty (60) inches; steel, laminated plastic top; locking, one (1) or two (2) file drawers single pedestal; steel; provide five (5) keys to District.

- (2) Tables: Two (2) tables; thirty-six (36) inches by sixty (60) inches; twenty-nine (29) inches high; steel, laminated plastic top tables; one (1) at each desk.
 - (3) Chairs: Two (2) chairs: swivel; steel; with seat cushion and arms; one (1) at each desk.
 - (4) Waste Baskets: Two (2) waste baskets, one at each desk.
- B. Furniture and Equipment: Provide in the space located to effect efficient and logical use.
- (1) File cabinet: One (1); four (4) drawer; lateral; steel locking.
 - (2) Plan Table: One (1) plan table: thirty-six (36) inches deep by seventy-two (72) inches wide by forty-two (42) inches high; adjustable; wood or steel; with lockable plan and pencil drawers.
 - (3) Drafting Stool: One (1) drafting stool; swiveling; steel; padded; adjustable; with footrest and casters.
 - (4) Bookshelf: One (1) bookshelf: thirty-six (36) inches deep by seventy-two (72) inches wide by forty-two (42) inches high; adjustable; wood or steel; with lockable plan and pencil drawer.
 - (5) Plan Rack: One (1) wheel mounted plan rack.
 - (6) Waste Baskets: One (1) large waste basket.
 - (7) Coat/Hat Hanger: Wall mounted with minimum capacity for four (4) garments and ten (10) hats.
 - (8) Document Management System: Shall include an integrated high-volume printer, copier, and facsimile machine, including stand, base, and storage cabinet; and shall include the following features:
 - (a) Type: Laser, dry electrostatic transfer, plain paper, digital, multi-function imaging system.
 - (b) Network: Ethernet or Token Ring network ready, Plug-and-Play.
 - (c) Print, send/receive facsimile from any connected workstation.
 - (d) Resolution: Six hundred (600) dots per inch by six hundred (600) dots per inch, minimum.
 - (e) Print Speed: Twenty (20) pages per minute, minimum.
 - (f) Copies: Twenty (20) copies per minute, minimum.
 - (g) Document Handler: Forty (40) sheet, minimum

- (h) Collator: Forty (40) bin, minimum, with stapling.
- (i) Duplexing: Capable.
- (j) Paper Size: Capable of handling paper sizes to eleven (11) inches by seventeen (17) inches.
- (k) Paper Cassettes: One (1) each for eight and one half (8.5) inches by eleven (11) inches, eight and one half (8.5) inches by fourteen (14) inches, and eleven (11) inches by seventeen (17) inches paper sizes; minimum two hundred fifty (250) sheets per cassette.
- (l) Reduction/Enlargement: Capable of reduction to twenty-five percent (25%) and enlargement to two hundred percent (200%).
- (m) Facsimile Electronic Storage: Capable of storing minimum of fifty (50) speed dial numbers, group faxing and broadcast faxing.
- (n) Facsimile Scanning: Capable of scanning into memory a minimum of one hundred (100) pages with maximum scan time of three (3) seconds per page.
- (o) Halftone: Sixty-four (64) levels.
- (p) Redial: Automatic and Manual.
- (9) Maintenance: Contractor shall purchase service agreements for each unit of equipment for the duration of the project plus two (2) months, and shall maintain all equipment in proper working condition. Service agreements shall include provision for replacement of toner cartridges and other items required to effect proper unit use. Service agreements shall also provide for:
 - (a) Unlimited Service Calls.
 - (b) Same Day Response.
 - (c) All parts, labor, preventative maintenance and mileage.
 - (d) All chemicals, such as toner, fixing agent, and the like.
 - (e) System training and setup.
- (10) Portable Toilets: Two (2); each shall include a urinal; each unit shall be a properly enclosed chemical unit conforming to ANSI Z4.3.
 - (a) Location: As directed by District.
 - (b) Maintenance: Maintain each unit and surrounding areas in a clean, hygienic and orderly manner, at all time. Empty, clean,

and sanitize each unit each day at a location and time as directed by District.

- (c) Removal: Relocate, or remove from the site, each Portable Toilet. Upon such directive by District, the Contractor shall forthwith relocate or remove each Portable Toilet and submit the affected areas to a condition which existed prior to the installation of each Portable Toilet, within three (3) calendar days, or as directed by District in writing, at no cost to District.

2.03 UTILITY AND SERVICES

- A. Telephone Service: Contractor shall provide and interface the entire telephone service, and shall properly and timely pay for telephone service for District's non-long-distance use.
- B. Electrical Service: Provide all proper connections and continuously pay for service for the duration of the Work.

2.04 FINISHES

- A. General: Manufacturer standard finish system over surfaces properly cleaned, pretreated, and prepared to obtain proper bond; all visible surfaces shall be coated.
- B. Finish: Color as selected by District from manufacturer standard palette.

PART 3 – EXECUTION

3.01 INSTALLATION

- A. General: Properly prepare area and affected items to receive the Work. Set Work accurately in location, alignment, and elevation; rigidly, securely, and firmly anchor to appropriate structure; install plumb, straight, square, level, true, without racking, rigidly anchored to proper solid blocking, substrate, and the like; provide appropriate type and quantity of reinforcements, fasteners, adhesives, self-adhesive and other tapes; lubricants, coatings, accessories, and the like, as required for a complete, structurally rigid, stable, sound, and appropriately finished installation, in accordance with manufacturer's published instructions, and as indicated. The more restrictive and higher quality requirement shall govern. Moving parts shall be properly secured, without binding, looseness, noise, and the like.
- B. Installation: Install in accordance with 25 CCR 3.2.3 and as directed by District; jack up trailer and level both ways; mount on proper concrete piers with all load off wheels; provide required tie down and accessories per Section 4368 of referenced CCR, and as directed by District.
- C. Rejected Work: Work, materials, unit, items, systems, and the like, not accepted by District shall be deemed rejected, and shall forthwith be removed and replaced with proper and new Work, materials, unit, items, systems, and the like at no cost to District.

- D. Standard: Comply with manufacturer's published instructions, or with instructions as shown or indicated; the more restrictive and higher quality requirement shall govern.
- E. Location: As directed by District.
- F. Fire Resistance: Construct and install in accordance with UL requirements.
- G. Maintenance: Contractor shall maintain trailer and adjacent areas in a safe, clean and hygienic condition throughout the duration of the Work, and as directed by District. Properly repair or replace furniture or other items, as directed by District. Properly remove unsafe, damaged, or broken furniture, or similar items, and replace with safe and proper items. Contractor shall pay cost of all services, repair, and maintenance, or replacement of each item.
- H. Janitorial Service: Provide professional janitorial services, including, but not limited to, trash, waste paper baskets, fill paper dispensers; clean and dust all furniture, files, and the like; sweep and mop resilient and similar flooring; and vacuum carpeting and similar flooring.
 - (1) Frequency: Two (2) times per week, minimum.
- I. Removal: Properly remove the Office Trailer and contents from the Site upon completion of the Contract, or as directed by District in writing. Forthwith properly patch and repair affected areas; replace damaged items with new items. Carefully and properly inventory, clean, pack, store, and protect District property; submit District property to District at a date, time and location as directed by District.

END OF DOCUMENT

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: VOC restrictions for product categories listed below under Article "DEFINITIONS" and in compliance with the following.
 - 1. California Code of Regulations, Title 24, Part 11 California Green Building Standards Code.
 - 2. Local Agency.
 - 3. No Rating System is applicable.
- B. Products of each category that are installed in the project must comply; applicable laws and ordinances do not allow for partial compliance.
- C. Listing of a product in these Specifications shall not be construed as a solicitation or requirement to use any product or combination of products in violation of the requirements of South Coast Air Quality Management District Rule No.1168, as described in Rule 1168(g).
 - 1. If a listed product does not meet the requirements of this rule, request approval for use of an alternate product by the same or another manufacturer meeting the requirements of this rule.
 - 2. Do not use products which do not meet the requirements of this rule.

1.2 RELATED REQUIREMENTS

- A. Divisions 01 through 33 contain related requirements specific to the work of each of these Sections. Requirements may or may not include reference to this Section.
- B. Section 01 8113, Sustainable Design Requirements, for CAL-Green general requirements and procedures.

1.3 REFERENCES

- A. California Green Building Standards Code (CALGreen), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. Low-Emitting Materials Product List; California Collaborative for High Performance Schools (CHPS); current edition at www.chps.net/.
- C. CRI (GLCC) - Green Label Testing Program - Approved Product Categories for Carpet Cushion; Carpet and Rug Institute; current edition.
- D. CRI (GLP) - Green Label Plus Carpet Testing Program - Approved Products; Carpet and Rug Institute; current edition.
- E. GEI (SCH) - GREENGUARD "Children and Schools" Certified Products; GREENGUARD Environmental Institute; current listings at www.greenguard.org.

VOLATILE ORGANIC COMPOUND (VOC) RESTRICTIONS

SECTION 01 6116

3595001

- F. GreenSeal GS-36 - Commercial Adhesives; Green Seal, Inc.
- G. SCAQMD 1168 - South Coast Air Quality Management District Rule No.1168; current edition; www.aqmd.gov.
- H. SCS (CPD) - SCS Certified Products; Scientific Certification Systems; current listings at www.scs-certified.com.

1.4 DEFINITIONS

- A. VOC-Restricted Products: Products of each of the following categories when installed or applied on-site:
 - 1. Adhesives, sealants, and sealer coatings, regardless of specification Section or Division.
 - 2. Paints and coatings.
 - 3. Carpet and resilient flooring.
 - 4. Composite wood products; plywood, particleboard, wood fiberboard.
- B. Adhesives: Gunnable, trowelable, liquid-applied, and aerosol adhesives, whether specified or not; including flooring adhesives, resilient base adhesives, and pipe jointing adhesives.
- C. Sealants: Gunnable, trowelable, and liquid-applied joint sealants and sealant primers, whether specified or not; including firestopping sealants and duct joint sealers.

1.5 SUBMITTAL REQUIREMENTS

- A. Product Data: For each VOC-restricted product used in the project, submit product data showing compliance, except when another type of evidence of compliance is required.
- B. Verification of Compliance: Submit for each different product in each applicable category.
 - 1. Identify evidence submittals with the words "CALGreen VOC Compliance Report".
- C. Installer Certifications for Accessory Materials:
 - 1. Require each installer of any type of product, not just the products for which VOC restrictions are specified, to certify that either 1) no adhesives, joint sealants, paints, coatings, or composite wood or agrifiber products have been used in the installation of their products, or 2) that such products used comply with these requirements.
 - 2. Use the form following at the end of Part 3 in this Section for Installer certifications.

1.6 QUALITY ASSURANCE

- A. Manufacturer's Testing Agency Qualifications: Independent firm specializing in performing testing and inspections of the type specified in this Section.

VOLATILE ORGANIC COMPOUND (VOC) RESTRICTIONS
SECTION 01 6116
3595001

PART 2 - PRODUCTS

2.1 MATERIALS

A. General:

1. Provide products conforming to local, State and Federal government requirements limiting the amount of volatile organic compounds contained in the product, for its intended application. If specified product exceeds current requirement, provide conforming product at no additional cost.
2. Provide only products having volatile organic compound (VOC) content not greater than required by South Coast Air Quality Management District Rule No.1168 and less where required by code.
3. Products are specified in multiple Sections throughout these Specifications.

B. Composite Wood Products: Comply with CALGreen Section 5.504 and Table 5.504.4.5 formaldehyde limits for hardwood plywood, particleboard, and medium density fiberboard composite wood products used on the interior and exterior of the building.

1. Verification of Compliance: Acceptable types are:
 - a. Certification by manufacturer that product complies with requirements.
 - b. Published product data showing compliance with requirements.
 - c. Chain of custody certifications.
 - d. Product labeled and invoiced as meeting the Composite Wood Products regulation (CCR, Title 17, Section 93120, et seq.).
 - e. Products marked as meeting the PS-1 or PS-2 standards of the Engineered Wood Association, the Australian AS/NZS 2269, or European 636 3S standards.
 - f. Other method acceptable to enforcing agency.

Table 5.504.4.5 FORMALDEHYDE LIMITS	
Maximum Formaldehyde Emissions in Parts per Million	
Product	Current Limit
Hardwood plywood veneer core	0.05
Hardwood plywood composite core	0.05
Particleboard	0.09
Medium density fiberboard	0.11
Thin medium density fiberboard ¹	0.13
Note 1: Thin medium density fiberboard has a maximum thickness of 5/16 inch (8 mm).	

C. Joint Sealants: Comply with CALGreen Section 5.504 and Table 5.504.4.2.

1. Verification of Compliance: Acceptable types are:
 - a. Report of laboratory testing performed in accordance with requirements.
 - b. Published product data showing compliance with requirements.

VOLATILE ORGANIC COMPOUND (VOC) RESTRICTIONS
SECTION 01 6116
3595001

- c. Certification by manufacturer that product complies with requirements.
- 2. Products used shall comply with the following limits.

Table 5.504.4.2 SEALANT VOC LIMIT	
Less Water and Less Exempt Compounds in Grams per Liter	
Sealant	Current VOC Limit
Architectural	250
Marine Deck	760
Non-Membrane Roof	300
Roadway	250
Single-Ply Roof Membrane	450
Other	420
Sealant Primers	Current VOC Limit
Architectural	
Non-Porous	250
Porous	775
Modified Bituminous	500
Marine Deck	760
Other	750
For low-solid adhesives or sealants the VOC limit is expressed in grams per liter of material; for all other adhesives and sealants, VOC limits are expressed as grams of VOC per liter of adhesive or sealant less water and less exempt compounds.	

- D. Paints and Coatings: Comply with CALGreen Section 5.504 and Table 5.504.4.3 based on the California Air Resources Board, Architectural Coatings Suggested Control Measure.
 - 1. Determination of VOC Content: Testing and calculation in accordance with 40 CFR 59, Subpart D (EPA Method 24), exclusive of colorants added to a tint base and water added at Project site; or other method acceptable to authorities having jurisdiction.
 - a. Verification of Compliance: Acceptable types are:
 - 1) Report of laboratory testing performed in accordance with requirements.
 - 2) Published product data showing compliance with requirements.
 - 3) Certification by manufacturer that product complies with requirements.
 - 2. Provide coatings that comply with the most stringent requirements specified in the following:
 - a. 40 CFR 59, Subpart D--National Volatile Organic Compound Emission Standards for Architectural Coatings.
 - b. South Coast Air Quality Management District Rule No.1168.
 - 3. Products used shall comply with the following limits.

VOLATILE ORGANIC COMPOUND (VOC) RESTRICTIONS
SECTION 01 6116
3595001

Table 5.504.4.3 VOC CONTENT LIMITS FOR ARCHITECTURAL COATINGS (See Notes 2 & 3 below)	
Grams of VOC per Liter of Coating, less water and less exempt compounds	
Coating Category	Current VOC Limit 1/1/2012
Flat Coatings	50
Non-Flat Coatings	100
Non-Flat High Gloss Coatings	150
Specialty Coatings	
Aluminum Roof Coatings	400
Basement Specialty Coatings	400
Bituminous Roof Coatings	50
Bituminous Roof Primers	350
Bond Breakers	350
Concrete Curing Compounds	350
Concrete / Masonry Sealers	100
Driveway Sealers	50
Dry Fog Coatings	150
Faux Finishing Coatings	350
Fire Resistive Coatings	350
Floor Coatings	100
Form-Release Compounds	250
Graphic Arts Coatings (Sign Paints)	500
High-Temperature Coatings	420
Industrial Maintenance Coatings	250
Low Solids Coatings (See Note 1 below)	120
Magnesite Cement Coatings	450
Mastic Texture Coatings	100
Metallic Pigmented Coatings	500
Multicolor Coatings	250
Pretreatment Wash Primers	420
Primers, Sealers and Undercoaters	100
Reactive Penetrating Sealers	350
Recycled Coatings	250
Roof Coatings	50
Rust Preventative Coatings	250
Shellacs:	
Clear	730
Opaque	550
Specialty Primers, Sealers and Undercoaters	100
Stains	250
Stone Consolidants	450
Swimming Pool Coatings	340
Traffic Marking Coatings	100
Waterproofing Membranes	250
Wood Coatings	275

VOLATILE ORGANIC COMPOUND (VOC) RESTRICTIONS
SECTION 01 6116
3595001

Table 5.504.4.3 VOC CONTENT LIMITS FOR ARCHITECTURAL COATINGS (See Notes 2 & 3 below)	
Grams of VOC per Liter of Coating, less water and less exempt compounds	
Coating Category	Current VOC Limit 1/1/2012
Wood Preservatives	350
Zinc Rich Primers	340
Note 1: Grams of VOC per liter of coating including water and including exempt compounds	
Note 2: Not Applicable	
Note 3: Values in this table are derived from those specified by the California Air Resources Board, Architectural Coatings Suggested Control Measure, February 1, 2008. More information is available from the Air Resources Board.	

4. Restricted Components: In addition to the specified VOC limits, paints and coatings shall not contain any of the following:
- Acrolein.
 - Acrylonitrile.
 - Antimony.
 - Benzene.
 - Butyl benzyl phthalate.
 - Cadmium.
 - Di (2-ethylhexyl) phthalate.
 - Di-n-butyl phthalate.
 - Di-n-octyl phthalate.
 - 1,2-dichlorobenzene.
 - Diethyl phthalate.
 - Dimethyl phthalate.
 - Ethylbenzene.
 - Formaldehyde.
 - Hexavalent chromium.
 - Isophorone.
 - Lead.
 - Mercury.
 - Methyl ethyl ketone.
 - Methyl isobutyl ketone.
 - Methylene chloride.
 - Naphthalene.
 - Toluene (methylbenzene).
 - 1,1,1-trichloroethane.

- y. Vinyl chloride.

PART 3 - EXECUTION

3.1 FIELD QUALITY CONTROL

- A. Owner reserves the right to reject non-compliant products, whether installed or not, and require their removal and replacement with compliant products at no extra cost to Owner.
- B. Additional costs to restore indoor air quality, including fines by authorities, due to installation of non-compliant products shall be borne by Contractor.

3.2 CERTIFICATION FORM

- A. Use of this Form:
 - 1. Because installers are allowed and directed to choose accessory materials suitable for the applicable installation, there is a possibility that such accessory materials might contain VOC content in excess of that permitted, especially where such materials have not been explicitly specified.
 - 2. Contractor is required to obtain and submit this Form from each installer of work on this project.
 - 3. For each product category listed, circle the correct words in brackets: either [HAS] or [HAS NOT].
 - 4. If these accessory materials have been used, attach to this form product data and MSDS sheet for each such product.

(The Remainder of this Page is Intentionally Left Blank)

VOLATILE ORGANIC COMPOUND (VOC) RESTRICTIONS
SECTION 01 6116
3595001

ACCESSORY MATERIAL VOC CONTENT CERTIFICATION FORM

IDENTIFICATION:

Project Name: _____

Project No.: _____

Architect: _____

PRODUCT CERTIFICATION: I certify that the installation work of my firm on this project:

1. [HAS] [HAS NOT] required the use of any ADHESIVES.
2. [HAS] [HAS NOT] required the use of any JOINT SEALANTS.
3. [HAS] [HAS NOT] required the use of any PAINTS OR COATINGS.
4. [HAS] [HAS NOT] required the use of any COMPOSITE WOOD or AGRIFIBER PRODUCTS.

Product data and MSDS sheets are attached.

CERTIFIED BY (Installer/Manufacturer/Supplier Firm):

Firm Name: _____

Print Name: _____

Signature: _____

Title: _____ (officer of company)

Date: _____

END OF SECTION

p:\sacramento\3595 tracy unified school district\001-000_villalovoz es new shade structures\08 specifications\06 spec\04 final\poet christian\01 6116_volatile organic compound (voc) restrictions.docx
Last Updated: January 18, 2022

SECTION 01 66 00

PRODUCT DELIVERY, STORAGE AND HANDLING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Site Access, Conditions and Requirements;
- B. Special Conditions.

1.02 PRODUCTS

- A. Products are as defined in the General Conditions.
- B. Contractor shall not use and/or reuse materials and/or equipment removed from existing Premises, except as specifically permitted by the Contract Documents.
- C. Contractor shall provide interchangeable components of the same manufacturer, for similar components.

1.03 TRANSPORTATION AND HANDLING

- A. Contractor shall transport and handle Products in accordance with manufacturer's instructions.
- B. Contractor shall promptly inspect shipments to confirm that Products comply with requirements, quantities are correct, and products are undamaged.
- C. Contractor shall provide equipment and personnel to handle Products by methods to prevent soiling, disfigurement, or damage.

1.04 STORAGE AND PROTECTION

- A. Contractor shall store and protect Products in accordance with manufacturer's instructions, with seals and labels intact and legible. Contractor shall store sensitive products in weather-tight, climate controlled enclosures.
- B. For exterior storage of fabricated Products, Contractor shall place on sloped supports, above ground.
- C. Contractor shall provide off-site storage and protection when Site does not permit on-site storage or protection.

- D. Contractor shall cover products subject to deterioration with impervious sheet covering and provide ventilation to avoid condensation.
- E. Contractor shall store loose granular materials on solid flat surfaces in a well-drained area and prevent mixing with foreign matter.
- F. Contractor shall provide equipment and personnel to store Products by methods to prevent soiling, disfigurement, or damage.
- G. Contractor shall arrange storage of Products to permit access for inspection and periodically inspect to assure Products are undamaged and are maintained under specified conditions.

PART 2 – PRODUCTS Not Used.

PART 3 - EXECUTION Not Used.

END OF DOCUMENT

CUTTING AND PATCHING

PART 1 – GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Inspector, Inspections, and Tests, Integration of Work, Nonconforming Work, and Correction of Work, and Uncovering Work;
- B. Special Conditions;
- C. Imported Materials Certification.

1.02 CUTTING AND PATCHING:

- A. Contractor shall be responsible for all cutting, fitting, and patching, including associated excavation and backfill, required to complete the Work or to:
 - (1) Make several parts fit together properly.
 - (2) Uncover portions of Work to provide for installation of ill-timed Work.
 - (3) Remove and replace defective Work.
 - (4) Remove and replace Work not conforming to requirements of Contract Documents.
 - (5) Remove Samples of installed Work as specified for testing.
 - (6) Provide routine penetrations of non-structural surfaces for installation of piping and electrical conduit.
 - (7) Attaching new materials to existing remodeling areas – including painting (or other finishes) to match existing conditions.
- B. In addition to Contract requirements, upon written instructions from the District, Contractor shall uncover Work to provide for observations of covered Work in accordance with the Contract Documents; remove samples of installed materials for testing as directed by District; and remove Work to provide for alteration of existing Work.
- C. Contractor shall not cut or alter Work, or any part of it, in such a way that endangers or compromises the integrity of the Work, the Project, or work of others.

1.03 SUBMITTALS:

- A. Prior to any cutting or alterations that may affect the structural safety of Project, or work of others, and well in advance of executing such cutting or alterations, Contractor shall submit written notice to District pursuant to the applicable notice provisions of the Contract Documents, requesting consent to proceed with the cutting or alteration, including the following:
 - (1) The work of the District or other trades.
 - (2) Structural value or integrity of any element of Project.
 - (3) Integrity or effectiveness of weather-exposed or weather-resistant elements or systems.
 - (4) Efficiency, operational life, maintenance or safety of operational elements.
 - (5) Visual qualities of sight-exposed elements.
- B. Contractor's Request shall also include:
 - (1) Identification of Project.
 - (2) Description of affected Work.
 - (3) Necessity for cutting, alteration, or excavations.
 - (4) Effects of Work on District, other trades, or structural or weatherproof integrity of Project.
 - (5) Description of proposed Work:
 - (a) Scope of cutting, patching, alteration, or excavation.
 - (b) Trades that will execute Work.
 - (c) Products proposed to be used.
 - (d) Extent of refinishing to be done.
 - (6) Alternates to cutting and patching.
 - (7) Cost proposal, when applicable.
 - (8) The scheduled date the Contractor intends to perform the Work and the duration of time to complete the Work.
 - (9) Written permission of District or other District contractor(s) whose work will be affected.

1.04 QUALITY ASSURANCE:

- A. Contractor shall ensure that cutting, fitting, and patching shall achieve security, strength, weather protection, appearance for aesthetic match, efficiency, operational life, maintenance, safety of operational elements, and the continuity of existing fire ratings.
- B. Contractor shall ensure that cutting, fitting, and patching shall successfully duplicate undisturbed adjacent profiles, materials, textures, finishes, colors, and that materials shall match existing construction. Where there is dispute as to whether duplication is successful or has been achieved to a reasonable degree, the District's decision shall be final.

1.05 PAYMENT FOR COSTS:

- A. Cost caused by ill-timed or defective Work or Work not conforming to Contract Documents, including costs for additional services of the District, its consultants, including but not limited to the Construction Manager, the Architect, the Project Inspector(s), Engineers, and Agents, will be paid by Contractor and/or deducted from the Contract by the District.
- B. District shall only pay for cost of Work if it is part of the original Contract Price or if a change has been made to the contract in compliance with the provisions of the General Conditions. Cost of Work performed upon instructions from the District, other than defective or nonconforming Work, will be paid by District on approval of written Change Order. Contractor shall provide written cost proposals prior to proceeding with cutting and patching.

PART 2 - PRODUCTS

2.01 MATERIALS:

- A. Contractor shall provide for replacement and restoration of Work removed. Contractor shall comply with the Contract Documents and with the Industry Standard(s), for the type of Work, and the Specification requirements for each specific product involved. If not specified, Contractor shall first recommend a product of a manufacturer or appropriate trade association for approval by the District.
- B. Materials to be cut and patched include those damaged by the performance of the Work.

PART 3 – EXECUTION

3.01 INSPECTION:

- A. Contractor shall inspect existing conditions of the Site and the Work, including elements subject to movement or damage during cutting and patching, excavating and backfilling. After uncovering Work, Contractor shall inspect conditions affecting installation of new products.

- B. Contractor shall report unsatisfactory or questionable conditions in writing to District as indicated in the General Conditions and shall proceed with Work as indicated in the General Conditions by District.

3.02 PREPARATION:

- A. Contractor shall provide shoring, bracing and supports as required to maintain structural integrity for all portions of the Project, including all requirements of the Project.
- B. Contractor shall provide devices and methods to protect other portions of Project from damage.
- C. Contractor shall, provide all necessary protection from weather and extremes of temperature and humidity for the Project, including without limitation, any work that may be exposed by cutting and patching Work. Contractor shall keep excavations free from water.

3.03 ERECTION, INSTALLATION AND APPLICATION:

- A. With respect to performance, Contractor shall:
 - (1) Execute fitting and adjustment of products to provide finished installation to comply with and match specified tolerances and finishes.
 - (2) Execute cutting and demolition by methods that will prevent damage to other Work, and provide proper surfaces to receive installation of repairs and new Work.
 - (3) Execute cutting, demolition excavating, and backfilling by methods that will prevent damage to other Work and damage from settlement.
- B. Contractor shall employ original installer or fabricator to perform cutting and patching for:
 - (1) Sight-exposed finished surfaces.
- C. Contractor shall execute fitting and adjustment of products to provide a finished installation to comply with specified products, functions, tolerances, and finishes as shown or specified in the Contract Documents including, without limitation, the Drawings and Specifications.
- D. Contractor shall fit Work airtight to pipes, sleeves, conduit, and other penetrations through surfaces. Contractor shall conform to all Code requirements for penetrations or the Drawings and Specifications, whichever calls for a higher quality or more thorough requirement. Contractor shall maintain integrity of both rated and non-rated fire walls, ceilings, floors, etc.
- E. Contractor shall restore Work which has been cut or removed. Contractor shall install new products to provide completed Work in accordance with requirements of the Contract Documents and as required to match surrounding areas and surfaces.

- F. Contractor shall refinish all continuous surfaces to nearest intersection as necessary to match the existing finish to any new finish.

END OF DOCUMENT

ALTERATION PROJECT PROCEDURES

PART 1 – GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Integration of Work, Purchase of Materials and Equipment, Uncovering of Work and Non-conforming Work and Correction of Work and Trenches;
- B. Special Conditions.

PART 2 - PRODUCTS

2.01 PRODUCTS FOR PATCHING AND EXTENDING WORK:

- A. New Materials: As specified in the Contract Documents including, without limitation, in the Specifications, Contractor shall match existing products, conditions, and work for patching and extending work.
- B. Type and Quality of Existing Products: Contractor shall determine by inspection, by testing products where necessary, by referring to existing conditions and to the Work as a standard.

PART 3 - EXECUTION

3.01 EXAMINATION:

- A. Contractor shall verify that demolition is complete and that areas are ready for installation of new Work.
- B. By beginning restoration Work, Contractor acknowledges and accepts the existing conditions.

3.02 PREPARATION:

- A. Contractor shall cut, move, or remove items as necessary for access to alterations and renovation Work. Contractor shall replace and restore these at completion.
- B. Contractor shall remove unsuitable material not as salvage unless otherwise indicated in the Contract Documents. Unsuitable material may include, without limitation, rotted wood, corroded metals, and deteriorated masonry and concrete. Contractor shall replace materials as specified for finished Work.

- C. Contractor shall remove debris and abandoned items from all areas of the Site and from concealed spaces.
- D. Contractor shall prepare surface and remove surface finishes to provide for proper installation of new Work and finishes.

3.03 INSTALLATION:

- A. Contractor shall coordinate Work of all alternations and renovations to expedite completion and to accommodate District occupancy.
- B. Designated Areas and Finishes: Contractor shall complete all installations in all respects, including operational, and electrical work.
- C. Contractor shall remove, cut, and patch Work in a manner to minimize damage and to provide a means of restoring Products and finishes to original or specified condition.
- D. Contractor shall refinish visible existing surfaces to remain to specified condition for each material, with a neat and square or straight transition to adjacent finishes.
- E. Contractor shall install products as specified in the Contract Documents, including without limitation, the Specifications.

3.04 TRANSITIONS:

- A. Where new Work abuts or aligns with existing, Contractor shall perform a smooth and even transition. Patched Work must match existing adjacent work in texture and appearance.
- B. When finished surfaces are cut so that a smooth transition with new Work is not possible, Contractor shall terminate existing surface along a straight line at a natural line of division and make a recommendation for resolution to the District and the Architect for review and approval.

3.05 ADJUSTMENTS:

- A. Where a change of plane of 1/4 inch or more occurs, Contractor shall submit a recommendation for providing a smooth transition to the District and the Architect for review and approval.
- B. Contractor shall fit Work at penetrations of surfaces.

3.06 REPAIR OF DAMAGED SURFACES:

- A. Contractor shall patch or replace portions of existing surfaces, which are damaged, lifted, discolored, or showing other imperfections, in the area where the Work is performed.
- B. Contractor shall repair substrate prior to patching finish.

3.07 CULTIVATED AREAS AND OTHER SURFACE IMPROVEMENTS:

- A. Cultivated or planted areas and other surface improvements which are damaged by actions of the Contractor shall be restored by Contractor to their original condition or better, where indicated.
- B. Contractor shall protect and replace, if damaged, all existing guard posts, barricades, and fences.
- C. Contractor shall give special attention to avoid damaging or killing trees, bushes and/or shrubs on the Premises and/or identified in the Contract Documents, including without limitation, the Drawings.

3.08 FINISHES:

- A. Contractor shall finish surfaces as specified in the Contract Documents, including without limitations, the provisions of all Divisions of the Specifications.
- B. Contractor shall finish patches to produce uniform finish and texture over entire area. When finish cannot be matched, Contractor shall refinish entire surface to nearest intersections.

3.09 CLEANING:

- A. Contractor shall continually clean the Site and the Premises as indicated in the Contract Documents, including without limitation, the provisions in the General Conditions and the Specifications regarding cleaning.

END OF DOCUMENT

CONTRACT CLOSEOUT AND FINAL CLEANING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Completion of Work;
- B. Special Conditions;
- C. Temporary Facilities and Controls.

1.02 CLOSEOUT PROCEDURES

Contractor shall comply with all closeout provisions as indicated in the General Conditions.

1.03 FINAL CLEANING

- A. Contractor shall execute final cleaning prior to final inspection.
- B. Contractor shall clean interior and exterior glass and all surfaces exposed to view; remove temporary labels, tape, stains, and foreign substances, polish transparent and glossy surfaces, wax and polish new vinyl floor surfaces, vacuum carpeted and soft surfaces.
- C. Contractor shall clean equipment and fixtures to a sanitary condition.
- D. Contractor shall replace filters of operating equipment.
- E. Contractor shall clean debris from roofs, gutters, down spouts, and drainage systems.
- F. Contractor shall clean Site, sweep paved areas, and rake clean landscaped surfaces.
- G. Contractor shall remove waste and surplus materials, rubbish, and construction facilities from the Site and surrounding areas.

1.04 ADJUSTING

Contractor shall adjust operating products and equipment to ensure smooth and unhindered operation.

1.05 RECORD DOCUMENTS AND SHOP DRAWINGS

- A. Contractor shall legibly mark each item to record actual construction, including:
 - (1) Measured depths of foundation in relation to finish floor datum.
 - (2) Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permit surface improvements.
 - (3) Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.
 - (4) Field changes of dimension and detail.
 - (5) Details not on original Contract Drawings
 - (6) Changes made by modification(s).
 - (7) References to related Shop Drawings and modifications.
- B. Contractor will provide one set of Record Drawings to District.
- C. Contractor shall submit all required documents to District and/or Architect prior to or with its final Application for Payment.

1.06 INSTRUCTION OF DISTRICT PERSONNEL

- A. Before final inspection, at agreed upon times, Contractor shall instruct District's designated personnel in operation, adjustment, and maintenance of products, equipment, and systems.
- B. For equipment requiring seasonal operation, Contractor shall perform instructions for other seasons within six months or by the change of season.
- C. Contractor shall use operation and maintenance manuals as basis for instruction. Contractor shall review contents of manual with personnel in detail to explain all aspects of operation and maintenance.
- D. Contractor shall prepare and insert additional data in Operation and Maintenance Manual when the need for such data becomes apparent during instruction.
- E. Contractor shall review contents of manual with personnel in detail to explain all aspects of operation and maintenance.

1.07 SPARE PARTS AND MAINTENANCE MATERIALS

- A. Contractor shall provide products, spare parts, maintenance, and extra materials in quantities specified in the Specifications and in Manufacturer's recommendations.

- B. Contractor shall provide District with all required Operation and Maintenance Data at one time. Partial or piecemeal submissions of Operation and Maintenance Data will not be accepted.

PART 2 – PRODUCTS Not Used.

PART 3 – EXECUTION Not Used.

END OF DOCUMENT

OPERATION AND MAINTENANCE DATA

PART 1 – GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Completion of the Work;
- B. Special Conditions.

1.02 QUALITY ASSURANCE:

Contractor shall prepare instructions and data by personnel experienced in maintenance and operation of described products.

1.03 FORMAT:

- A. Contractor shall prepare data in the form of an instructional manual entitled "OPERATIONS AND MAINTENANCE MANUAL & INSTRUCTIONS" ("Manual").
- B. Binders: Contractor shall use commercial quality, 8-1/2 by 11 inch, three-side rings, with durable plastic covers; two inch maximum ring size. When multiple binders are used, Contractor shall correlate data into related consistent groupings.
- C. Cover: Contractor shall identify each binder with typed or printed title "OPERATION AND MAINTENANCE MANUAL & INSTRUCTIONS"; and shall list title of Project and identify subject matter of contents.
- D. Contractor shall arrange content by systems process flow under section numbers and sequence of Table of Contents of the Contract Documents.
- E. Contractor shall provide tabbed fly leaf for each separate product and system, with typed description of product and major component parts of equipment.
- F. Text: The content shall include Manufacturer's printed data, or typewritten data on 24 pound paper.
- G. Drawings: Contractor shall provide with reinforced punched binder tab and shall bind in with text; folding larger drawings to size of text pages.

1.04 CONTENTS, EACH VOLUME:

- A. Table of Contents: Contractor shall provide title of Project; names, addresses, and telephone numbers of the Architect, any engineers, subconsultants, Subcontractor(s), and Contractor with name of responsible parties; and schedule of products and systems, indexed to content of the volume.

- B. For Each Product or System: Contractor shall list names, addresses, and telephone numbers of Subcontractor(s) and suppliers, including local source of supplies and replacement parts.
- C. Product Data: Contractor shall mark each sheet to clearly identify specific products and component parts, and data applicable to installation. Delete inapplicable information.
- D. Drawings: Contractor shall supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams. Contractor shall not use Project Record Documents as maintenance drawings.
- E. Text: Contractor shall include any and all information as required to supplement product data. Contractor shall provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions.
- F. Warranties and Bonds: Contractor shall bind in one copy of each.

1.05 MANUAL FOR MATERIALS AND FINISHES:

- A. Building Products, Applied Materials, and Finishes: Contractor shall include product data, with catalog number, size, composition, and color and texture designations. Contractor shall provide information for re-ordering custom manufactured products.
- B. Instructions for Care and Maintenance: Contractor shall include Manufacturer's recommendations for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.
- C. Moisture Protection and Weather Exposed Products: Contractor shall include product data listing applicable reference standards, chemical composition, and details of installation. Contractor shall provide recommendations for inspections, maintenance, and repair.
- D. Additional Requirements: Contractor shall include all additional requirements as specified in the Specifications.
- E. Contractor shall provide a listing in Table of Contents for design data, with tabbed fly sheet and space for insertion of data.

1.06 MANUAL FOR EQUIPMENT AND SYSTEMS:

- A. Each Item of Equipment and Each System: Contractor shall include description of unit or system, and component parts and identify function, normal operating characteristics, and limiting conditions. Contractor shall include performance curves, with engineering data and tests, and complete nomenclature, and commercial number of replaceable parts.
- B. Panelboard Circuit Directories: Contractor shall provide electrical service characteristics, controls, and communications.

- C. Contractor shall include color coded wiring diagrams as installed.
- D. Operating Procedures: Contractor shall include start-up, break-in, and routine normal operating instructions and sequences. Contractor shall include regulation, control, stopping, shut-down, and emergency instructions. Contractor shall include summer, winter, and any special operating instructions.
- E. Maintenance Requirements: Contractor shall include routine procedures and guide for trouble-shooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.
- F. Contractor shall provide servicing and lubrication schedule, and list of lubricants required.
- G. Contractor shall include manufacturer's printed operation and maintenance instructions.
- H. Contractor shall include sequence of operation by controls manufacturer.
- I. Contractor shall provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.
- J. Contractor shall provide control diagrams by controls manufacturer as installed.
- K. Contractor shall provide Contractor's coordination drawings, with color coded piping diagrams as installed.
- L. Contractor shall provide charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams.
- M. Contractor shall provide list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.
- N. Additional Requirements: Contractor shall include all additional requirements as specified in Specification(s).
- O. Contractor shall provide a listing in Table of Contents for design data, with tabbed fly sheet and space for insertion of data.

1.07 SUBMITTAL:

- A. Contractor shall submit to the District for review two (2) copies of preliminary draft or proposed formats and outlines of the contents of the Manual within thirty (30) days of Contractor's start of Work.
- B. For equipment, or component parts of equipment put into service during construction and to be operated by District, Contractor shall submit draft content for that portion of the Manual within ten (10) days after acceptance of that equipment or component.

- C. Contractor shall submit two (2) copies of a complete Manual in final form prior to final Application for Payment. Copy will be returned with Architect/Engineer comments. Contractor must revise the content of the Manual as required by District prior to District's approval of Contractor's final Application for Payment.
- D. Contractor must submit two (2) copies of revised Manual in final form within ten (10) days after final inspection.

PART 2 – PRODUCTS Not Used.

PART 3 – EXECUTION Not Used.

END OF DOCUMENT

WARRANTIES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Warranty/Guarantee Information;
- B. Special Conditions.

1.02 FORMAT

- A. Binders: Contractor shall use commercial quality, 8-1/2 by 11 inch, three-side rings, with durable plastic covers; two inch maximum ring size.
- B. Cover: Contractor shall identify each binder with typed or printed title "WARRANTIES" and shall list title of Project.
- C. Table of Contents: Contractor shall provide title of Project; name, address, and telephone number of Contractor and equipment supplier; and name of responsible principal. Contractor shall identify each item with the number and title of the specific Specification, document, provision, or section in which the name of the product or work item is specified.
- D. Contractor shall separate each warranty with index tab sheets keyed to the Table of Contents listing, providing full information and using separate typed sheets as necessary. Contractor shall list each applicable and/or responsible Subcontractor(s), supplier(s), and/or manufacturer(s), with name, address, and telephone number of each responsible principal(s).

1.03 PREPARATION:

- A. Contractor shall obtain warranties, executed in duplicate by each applicable and/or responsible subcontractor(s), supplier(s), and manufacturer(s), within ten (10) days after completion of the applicable item or work. Except for items put into use with District's permission, Contractor shall leave date of beginning of time of warranty blank until the date of completion is determined.
- B. Contractor shall verify that documents are in proper form, contain full information, and are notarized, when required.
- C. Contractor shall co-execute submittals when required.
- D. Contractor shall retain warranties until time specified for submittal.

1.04 TIME OF SUBMITTALS:

- A. For equipment or component parts of equipment put into service during construction with District's permission, Contractor shall submit a draft warranty for that equipment or component within ten (10) days after acceptance of that equipment or component.
- B. Contractor shall submit for District approval all warranties and related documents within ten (10) days after date of completion. Contractor must revise the warranties as required by the District prior to District's approval of Contractor's final Application for Payment.
- C. For items of work delayed beyond date of completion, Contractor shall provide an updated submittal within ten (10) days after acceptance, listing the date of acceptance as start of warranty period.

PART 2 - PRODUCTS Not Used.

PART 3 – EXECUTION Not Used.

END OF DOCUMENT

(Letterhead of Contractor)

STANDARD GUARANTEE / WARRANTY

for

Project Name

Contract No.

We hereby warrant that the Work we have provided under the above reference Contract has been completed in accordance with the Drawings, Specifications, and other Contract Documents.

Under the terms of this warranty, we agree to repair or replace any or all of our work, together with any other adjacent work which may be displaced or damaged by so doing, which may prove to be either patently defective in its workmanship or latently defective in its workmanship or materials within the period of 24 months from the date of filing of the Notice of Completion of the above named Project by the Board of Trustees of the School District, and we also agree to repair any and all damages resulting from such defects, without any expense whatsoever to said Board of Trustees, ordinary wear and tear and unusual abuse or neglect excepted.

In the event of our failure to comply with above-mentioned guarantee conditions within ten (10) day after being notified in writing by the Owner, we collectively and separately do hereby authorize the Owner to have said defective work and damages repaired or replaced and made good at our expense and will honor and pay the costs and charges therefore upon demand.

SIGNED (Contractor) _____

(Address)

(Printed Name of Authorized Representative)

Signature

(License Number)

(Date of Signing)

COUNTERSIGNED (Owner) _____

(Printed Name of Authorized Representative)

Signature

Date of Filing or Notice of Completion: _____

(Letterhead of Company)

SUBCONTRACTOR STANDARD GUARANTEE / WARRANTY

We hereby warrant that

which we have provided in _____

Name of Project _____

for

District _____

has been completed in accordance with Specification Section _____ and requirements of the Contract Documents.

Under the terms of this warranty, we agree to repair or replace any or all of our work, together with any other adjacent work which may be displaced or damaged by so doing, which may prove to be either patently defective in its workmanship or latently defective in its workmanship or materials within a period of 24 months from date of filing the Notice of Completion of the above-named Project by the Board of Trustees of the School District without any expense whatsoever to said Board of Trustees, ordinary wear and tear and unusual abuse or neglect excepted.

In the event of our failure to comply with above-mentioned guarantee conditions within ten (10) day after being notified in writing by the Owner, we collectively and separately do hereby authorize the Owner to have said defective work and damages repaired or replaced and made good at our expense and will honor and pay the costs and charges therefore upon demand.

SIGNED (Subcontractor)

(Signature)

(Company Name)

(Address)

(License Number)

(Date of Signing)

COUNTERSIGNED (General Contractor)

(Signature)

(Company Name)

(Address)

(License Number)

(Date of Signing)

(Letterhead of Company)

SPECIAL EXTENDED WRITTEN GUARANTEE / WARRANTY

We hereby warrant that

which we have provided in _____

Name of Project

for _____

District

has been completed in accordance with Specification Section _____ and requirements of the Contract Documents.

Under the terms of this warranty, we agree to repair or replace any or all of our work, together with any other adjacent work which may be displaced or damaged by so doing, which may prove to be either patently defective in its workmanship or latently defective in its workmanship or materials within a period of _____ year(s) from date of filing the Notice of Completion of the above-named Project by the Board of Trustees of the School District without any expense whatsoever to said Board of Trustees, ordinary wear and tear and unusual abuse or neglect excepted. We also agree to repair any and all damages resulting from such defects.

In the event of our failure to comply with above-mentioned conditions within a reasonable time but in no case longer than ten (10) calendar days after being notified in writing by the Owner, we collectively and separately do hereby authorize the Owner to have said defective work and damages repaired or replaced and made good at our expense and will honor and pay the costs and charges therefore upon demand.

SIGNED (Subcontractor)

(Name)

(Address)

(License Number)

(Date of Signing)

COUNTERSIGNED (General Contractor)

(Name)

(Address)

(License Number)

(Date of Signing)

RECORD DOCUMENTS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Documents on Work;
- B. Special Conditions.

PART 2 - RECORD DRAWINGS

2.01 GENERAL:

- A. As indicated in the Contract Documents, the District will provide Contractor with one set of reproducible, full size original Contract Drawings (mylars).
- B. Contractor shall maintain at each Project Site one set of marked-up plans and shall transfer all changes and information to those marked-up plans, as often as required in the Contract Documents, but in no case less than once each month. Contractor shall submit to the Project Inspector one set of reproducible vellums of the Project Record Drawings ("As-Built") showing all changes incorporated into the Work since the preceding monthly submittal. The As-Built shall be available at the Project Site. The Contractor shall submit reproducible vellums at the conclusion of the Project following review of the blue line prints.
- C. Label and date each Record Drawing "RECORD DOCUMENT" in legibly printed letters.
- D. All deviations in construction, including but not limited to pipe and conduit locations and deviations caused by without limitation Change Orders, Construction Claim Directives, RFI's, and Addenda, shall be accurately and legibly recorded by Contractor.
- E. Locations and changes shall be done by Contractor in a neat and legible manner and, where applicable, indicated by drawing a "cloud" around the changed or additional information.

2.02 RECORD DRAWING INFORMATION:

- A. Contractor shall record the following information:
 - (1) Locations of Work buried under or outside each building, including, without limitation, all utilities, plumbing and electrical lines, and conduits.

- (2) Actual numbering of each electrical circuit to match panel schedule.
- (3) Locations of significant Work concealed inside each building whose general locations are changed from those shown on the Contract Drawings.
- (4) Locations of all items, not necessarily concealed, which vary from the Contract Documents.
- (5) Installed location of all cathodic protection anodes.
- (6) Deviations from the sizes, locations, and other features of installations shown in the Contract Documents.
- (7) Locations of underground work, points of connection with existing utilities, changes in direction, valves, manholes, catch basins, capped stubouts, invert elevations, etc.
- (8) Sufficient information to locate Work concealed in each building with reasonable ease and accuracy.

In some instances, this information may be recorded by dimension. In other instances, it may be recorded in relation to the spaces in the building near which it was installed.

- B. Contractor shall provide additional drawings as necessary for clarification.
- C. Contractor shall provide reproducible record drawings, made from final Shop Drawings marked "No Exceptions Taken" or "Approved as Noted."
- D. After review and approval of the marked-up specifications by the Project Inspector, Contractor shall provide electronic copies of the drawings (in PDF format) with one file with all of the sheets and one set of individual sheet files at the conclusion of the Project.

PART 3 - RECORD SPECIFICATIONS

3.01 GENERAL:

- A. Contractor shall mark each section legibly to record manufacturer, trade name, catalog number, and supplier of each Product and item of equipment actually installed.
- B. After review and approval of the marked-up specifications by the Project Inspector, Contractor shall provide one electronic copy of the specifications (in PDF format) at the conclusion of the Project.

PART 4 - MAINTENANCE OF RECORD DOCUMENTS

4.01 GENERAL

- A. Contractor shall store Record Documents apart from documents used for construction as follows:

- (1) Provide files and racks for storage of Record Documents.
- (2) Maintain Record Documents in a clean, dry, legible condition and in good order.

B. Contractor shall not use Record Documents for construction purposes.

PART 5 – PRODUCTS Not Used.

END OF DOCUMENT

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes general requirements and procedures for compliance with California Code of Regulations, Title 24, Part 11 California Green Building Standards Code, "CAL-Green".

- 1. Chapter 5- Non-Residential Mandatory Measures.

1.2 RELATED REQUIREMENTS

- A. Pertinent sections specifying erosion control.
- B. Section 01 6116, Volatile Organic Compound (VOC) Restrictions.
- C. Document 01 5013, Construction Waste Management and Disposal.
- D. Document 01 7700, Contract Closeout and Final Cleaning.

1.3 DEFINITIONS

- A. CAL-Green Definitions: Certain terms are defined by CAL-Green in Chapter 5 of the code. Words and terms used in this section shall have the meanings shown therein.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Respond to questions and requests from Architect and the jurisdiction having authority regarding CAL-Green credits that are the responsibility of the Contractor, that depend on product selection or product qualities, or that depend on Contractor's procedures. Document responses as informational submittals.

1.5 SUBMITTALS

- A. CAL-GREEN Submittals: Submit CAL-GREEN submittals required by code and in other Specification Sections.
 - 1. CAL-GREEN submittals are in addition to other submittals. If submitted item is identical to that submitted to comply with other requirements, submit duplicate copies as a separate submittal to verify compliance with indicated CAL-GREEN requirements.
 - 2. Acceptable verification submittals are specified in the related sections.

SUSTAINABLE DESIGN REQUIREMENTS
SECTION 01 8113
3595001

PART 2 - PRODUCTS

2.1 REQUIREMENTS - GENERAL

- A. Provide products and procedures necessary to confirm CAL-GREEN compliance required in this Section. Although other Sections may specify some CAL-GREEN requirements, the Contractor shall determine additional materials, techniques, means, methods and procedures necessary to comply with CAL-GREEN requirements.

2.2 STORM WATER POLLUTION PREVENTION PLAN

- A. Section 5.106.1: Comply with requirements of this code section, local ordinances, General Conditions, Special Provisions, and related sections specifying erosion control.

2.3 OUTDOOR WATER USE

- A. Section 5.304.3.1: Irrigation Controllers: Comply with requirements of this code section, local ordinances and Section 32 8000.

2.4 CONSTRUCTION WASTE REDUCTION

- A. Section 5.408 Construction Waste Management, Diversion and Recycling: Comply with requirements of this code section, local ordinances and Section 01 7419.

2.5 BUILDING MAINTENANCE AND OPERATION

- A. Section 5.410.2.3, 4. Commissioning and Functional Performance Testing: Participate in Commissioning and provide functional performance testing as required by these code sections and as specified in Section 01 9113.
- B. Section 5.410.2.5. Documentation and Training: Provide Operations Training as required by these code sections and as specified in Section 01 7700 and Systems Manual as specified in Section 01 7700.

2.6 POLLUTANT CONTROL

- A. Section 5.504.3 Indoor Air Quality: Comply with requirements of this code section, local ordinances.
- B. Section 5.504.4 Finish Material Pollutant Control: All Finish materials shall comply with requirements of this code section, local ordinances and Section 01 6116.

PART 3 - EXECUTION

3.1 GENERAL

- A. Comply with Document 01 5013, Construction Waste Management and Disposal.

SUSTAINABLE DESIGN REQUIREMENTS
SECTION 01 8113
3595001

- B. Comply with execution requirements of related sections and applicable local codes and ordinances.

END OF SECTION

p:\sacramento\3595 tracy unified school district\001-000_villalovoz es new shade structures\08 specifications\06 spec\04 final\poet christian\01 8113.10_sustainable design requirements (cal-green).docx
Last Updated: April 8, 2019

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Sealants and backing for interior and exterior joints.

1.2 RELATED REQUIREMENTS

- A. Section 01 6116, Volatile Organic Compound (VOC) Restrictions, for VOC limits pertaining to adhesives, sealants, fillers, primers, and coatings.
- B. Section 01 8113, Sustainable Design Requirements, for CAL-Green general requirements and procedures.
- C. Pertinent Sections specifying sealants or referencing this Section for sealant products and installation requirements.
- D. Section 07 8413, Penetration Firestopping, for sealing joints in fire-resistance-rated construction.

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on Drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CAL Green), edition as noted on Drawings, as adopted by the California Division of the State Architect (DSA).
- C. American Concrete Institute (ACI) Publications and Standards:
 - 1. ACI 302.1R: Guide to Concrete Floor and Slab Construction.
 - 2. ACI 360R-10: Guide to Design of Slabs-on-Ground.
- D. ASTM International (ASTM):
 - 1. C834: Standard Specification for Latex Sealants.
 - 2. C919: Standard Practice for Use of Sealants in Acoustical Applications.
 - 3. C920: Standard Specification for Elastomeric Joint Sealants.
 - 4. C1193: Standard Guide for Use of Joint Sealants.
 - 5. C1247: Standard Test Method for Durability of Sealants Exposed to Continuous Immersion in Liquids.
 - 6. C1248: Standard Test Method for Staining of Porous Substrate by Joint Sealants.
 - 7. C1311: Standard Specification for Solvent Release Sealants.
 - 8. C1330: Standard Specification for Cylindrical Sealant Backing for Use with Cold Liquid-Applied Sealants.

JOINT SEALANTS
SECTION 07 9200
3595001

9. C1521: Standard Practice for Evaluating Adhesion of Installed Weatherproofing Sealant Joints.
 10. D1667: Standard Specification for Flexible Cellular Materials - Poly (Vinyl Chloride) Foam (Closed-Cell).
 11. E90: Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements.
- E. Federal Specifications (FS):
1. FS TT-S-001657: Sealing Compound--Single Component, Butyl Rubber Based, Solvent Release Type.
- F. South Coast Air Quality Management District (SCAQMD):
1. Rule 1168: Adhesive and Sealant Applications.
- G. U.S. Food & Drug Administration (FDA):
1. Code of Federal Regulations: Title 21, 21 CFR 177.2600, Rubber Articles Intended for Repeated Use.

1.4 DEFINITIONS

- A. Sealant Terminology in accordance with ASTM C834 and ASTM C920:
1. Type C: Clear / translucent sealant.
 2. Type OP: Opaque pigmented sealant.
 3. Type S: Single component sealant.
 4. Type M: Sealant with two or more components.
 5. Grade NS: Nonsag sealant.
 6. Grade P: Pourable sealant.
 7. Grade -18°C: Sealant with low temperature flexibility tested to -18°C (0°F).
 8. Grade 0°C: Sealant with low temperature flexibility tested to 0°C (32°F).
 9. Grade NF: Sealant does not meet low temperature flexibility requirements.
 10. Class 12-1/2: Sealant capable of handling movement, either contraction or expansion, of 12.5 percent of the original joint width.
 11. Class 25: Sealant capable of handling movement, either contraction or expansion, of 25 percent of the original joint width.
 12. Class 35: Sealant capable of handling movement, either contraction or expansion, of 35 percent of the original joint width.
 13. Class 50: Sealant capable of handling movement, either contraction or expansion, of 50 percent of the original joint width.
 14. Class 100 / 50: Sealant capable of handling movement of 50 percent contraction and 100 percent expansion.
 15. Use Related to Exposure:
 - a. Use NT: Nontraffic.
 - b. Use T: Traffic.
 - c. Use I: Immersible.

16. Use Related to Material:
 - a. Use A: Sealant used in contact with aluminum.
 - b. Use G: Sealant used in contact with glass.
 - c. Use M: Sealant used in contact with mortar.
 - d. Use O: Sealants used in contact with all other materials other than those previously listed.

1.5 ADMINISTRATIVE REQUIREMENTS

- A. Submittal Procedures:
 1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
 2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
 3. Sustainable Design Submittals shall comply with the additional requirement of Section 01 8113, Sustainable Design Requirements.
- B. Pre-Installation Meeting: Conduct at Project site. Review joint application procedures, compatibility tests, adhesion tests, and warranty requirements in a meeting involving Architect, Project Inspector, installer, manufacturer or manufacturer's representative.
- C. Coordination:
 1. Use of different manufacturer's sealant types for application at exterior wall and glazing systems is not permitted. It is required that a single source for silicone sealants be used on this Project. The Contractor is responsible for coordinating compliance with this requirement where installation of sealants is delegated to various Subcontractors installing the exterior envelope systems for the Project.
 2. Contractor shall coordinate and be responsible for compatibility and performance between sealants and other materials, and related Sections using sealants which may be in direct contact with work of this Section or adjacent to the other. Isolate and prevent of incompatibility between sealants in accordance with manufacturer's specifications, recommendations and instructions.

1.6 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated, demonstrate compliance with specified attributes.
 1. Include color chart from manufacturers for each joint sealant product required.
 2. Provide certification by joint sealant manufacturer that materials provided for this Section are 100 percent asbestos-free.
- B. Samples for initial Selection: In form of manufacturer's standard bead samples, consisting of strips of actual products showing full range of colors available, for each product exposed to view.

JOINT SEALANTS

SECTION 07 9200

3595001

- C. Samples for Verification: For each kind and color of joint sealant required, provide Samples with joint sealants in 1/2 inch wide joints formed between two 6 inch long strips of material matching the appearance of exposed surfaces adjacent to joint sealants.
- D. Joint-Sealant Schedule: Include the following information.
 - 1. Joint-sealant application, joint location, and designation.
 - 2. Joint-sealant manufacturer and product name.
 - 3. Joint-sealant formulation.
 - 4. Joint-sealant colors (multiple colors will be required).

1.7 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.
- B. Product Certificates: For each kind of joint sealant and accessory, from manufacturer.
- C. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, indicating that sealants comply with requirements.
 - 1. Preconstruction Compatibility and Adhesion Test Reports from sealant manufacturer, indicating the following:
 - a. Materials forming joint substrates and joint-sealant backings have been tested for compatibility and adhesion with joint sealants.
 - b. Interpretation of test results and written recommendations for primers and substrate preparation needed for adhesion.
 - 2. Preconstruction Field-Adhesion Test Reports: Indicate which sealants and joint preparation methods resulted in optimum adhesion to joint substrates based on testing specified in this Section.
- D. Sustainable Design:
 - 1. General:
 - a. Submit information necessary to establish and document compliance with the California Green Building Standards Code.
 - b. Sustainable design submittals are in addition to other submittals.
 - 2. The following information shall be provided:
 - a. Adhesives and Sealants: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.
- E. Sample of manufacturer's warranty.
- F. Record of Pre-Installation Meeting.

1.8 CLOSEOUT SUBMITTALS

- A. Warranty and Guarantee: Submit executed warranty and extended Contractor guarantee.

1.9 QUALITY ASSURANCE

- A. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for installation of sealants and backing required for this Project.
- B. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.
- C. Single Source Responsibility: Obtain each kind of joint sealant from single source from single manufacturer.
- D. Materials, components, assemblies, workmanship and installation are to be observed by the Project Inspector. Work not so inspected is subject to uncovering and replacement.
- E. Mockups: Install sealant in mockups of assemblies specified in other Sections that are indicated to receive joint sealants specified in this Section. Use materials and installation methods specified in this Section.

1.10 PRECONSTRUCTION TESTING

- A. Preconstruction Testing is not required if joint-sealant manufacturers submit joint preparation data that are based on previous testing, not older than 24 months, of sealant products for adhesion to, and compatibility with, joint substrates and other materials matching those submitted.
- B. Preconstruction Compatibility and Adhesion Testing: Submit to sealant manufacturers, for testing indicated below, samples of materials that will contact or affect joint sealants.
 - 1. Use manufacturer's standard test method to determine whether priming and other specific joint preparation techniques are required to obtain rapid, optimum adhesion of joint sealants to joint substrates.
 - 2. Submit not fewer than eight pieces of each kind of material, including joint substrates, shims, joint-sealant backings, secondary seals, and miscellaneous materials.
 - 3. Schedule sufficient time for testing and analyzing results to prevent delaying the Work.
 - 4. For materials failing tests, obtain joint-sealant manufacturer's written instructions for corrective measures including use of specially formulated primers.
- C. Preconstruction Field-Adhesion Testing: Before installing sealants, field test their adhesion to Project joint substrates as follows:
 - 1. Locate test joints where indicated on Project or, if not indicated, as directed by Architect.
 - 2. Conduct field tests for each kind of sealant and joint substrate indicated.
 - 3. Notify Architect seven days in advance of dates and times when test joints will be erected.
 - 4. Arrange for tests to take place with joint-sealant manufacturer's technical representative present.

JOINT SEALANTS
SECTION 07 9200
3595001

5. Test Method: Test joint sealants according to Method A, Field-Applied Sealant Joint Hand Pull Tab, in Appendix X1 in ASTM C 1193 or Method A, Tail Procedure, in ASTM C 1521.
 - a. For joints with dissimilar substrates, verify adhesion to each substrate separately; extend cut along one side, verifying adhesion to opposite side. Repeat procedure for opposite side.
6. Report whether sealant failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each kind of product and joint substrate. For sealants that fail adhesively, retest until satisfactory adhesion is obtained.
7. Evaluation of Preconstruction Field-Adhesion-Test Results: Sealants not evidencing adhesive failure from testing, in absence of other indications of noncompliance with requirements, will be considered satisfactory. Do not use sealants that fail to adhere to joint substrates during testing.

1.11 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials to project site in original factory wrappings and containers, labeled with identification of manufacturer, product name and designation, color, expiration period for use, pot life, curing time, and mixing instructions for multicomponent materials.
- B. Store and handle materials in compliance with manufacturer's recommendations to prevent their deterioration or damage due to moisture, high or low temperatures, contaminants, or other causes.

1.12 FIELD CONDITIONS

- A. Environmental Conditions: Do not proceed with installation of joint sealants under the following conditions:
 1. When ambient and substrate temperature conditions are outside the limits permitted by joint sealant manufacturer.
 2. When joint substrates are wet.
- B. Joint Width Conditions: Do not proceed with installation of joint sealants where joint widths are less than allowed by joint sealant manufacturer for application indicated.
- C. Joint Substrate Conditions: Do not proceed with installation of joint sealants until contaminants capable of interfering with their adhesion are removed from joint substrates.

1.13 WARRANTY AND GUARANTEE

- A. Manufacturer: In addition to the Contractor's and Subcontractor's Standard Guarantee, furnish Owner with manufacturer's fully executed written warranty for sealant against defects in materials and workmanship for a period of 5 years:
- B. Contractor: in addition to its standard Guarantee under the Contract, furnish Owner a special extended written five-year guarantee, cosigned by installer, for sealant, agreeing to replace any and all joints that leaks or otherwise fails to perform as required within guarantee period as a result of failure of materials or installation workmanship at no additional cost to the Owner.

PART 2 - PRODUCTS

2.1 DESIGN AND PERFORMANCE CRITERIA

- A. Sustainable Design:
 - 1. VOC emissions for field-applied adhesives, sealants, and sealant primers must comply with limits specified in Section 01 6116.
- B. Building Envelope: Make watertight and weatherproof.
 - 1. Exterior work that does not remain watertight and all work which does not retain all properties inherent in the product as stipulated by the manufacturer will be considered faulty.
- C. Provide elastomeric joint sealants that have been produced and installed to establish and to maintain watertight and airtight continuous seals without causing staining or deterioration of joint substrates.
- D. Provide joint sealants for interior applications that have been produced and installed to establish and maintain airtight continuous seals that are water resistant and cause no staining or deterioration of joint substrates.
- E. Design Requirements:
 - 1. Seal building joints with non-sag type sealant.
 - 2. Seal floor joints with self-leveling or slope grade self-leveling type sealant.

2.2 MATERIALS, GENERAL

- A. Compatibility: Provide joint sealants, joint fillers, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by sealant manufacturer based on testing and field experience.
- B. Liquid-Applied Joint Sealants: Comply with ASTM C920 and other requirements indicated for each liquid-applied joint sealant specified, including those referencing ASTM C920 classifications for type, grade, class, and uses related to exposure and joint substrates.
 - 1. Suitability for Immersion in Liquids. Where sealants are indicated for Use I for joints that will be continuously immersed in liquids, provide products that have undergone testing according to ASTM C 1247. Liquid used for testing sealants is deionized water, unless otherwise indicated.
- C. Stain-Test-Response Characteristics: Where sealants are specified to be non-staining to porous substrates, provide products that have undergone testing according to ASTM C 1248 and have not stained porous joint substrates indicated for Project.
- D. Suitability for Contact with Food: Where sealants are indicated for joints that will come in repeated contact with food, provide products that comply with 21 CFR 177.2600.

JOINT SEALANTS
SECTION 07 9200
3595001

E. Colors:

1. General:
 - a. Architect will provide color selections and locations for each sealant type and for Contractor's use.
 - b. Not all locations will have the same color.
 - c. Custom colors **[will] [may]** be required.
2. Provide color of exposed joint sealants to comply with the following:
 - a. Provide colors matching selections made by Architect from manufacturer's full range of colors for products of type indicated.
 - b. Request color selection for exposed products listed without a preselected color.

2.3 SILICONE JOINT SEALANTS

- A. Single-Component, Nonsag, Neutral-Curing Silicone Joint Sealant: ASTM C920, Type S, Grade NS, Class 100 / 50, for Use NT.
 1. Products: The following, or equal:
 - a. The Dow Chemical Company; "DOWSIL" 790.
 - b. Sika Corporation, Construction Products Division; "Sikasil" WS-290.
- B. Single-Component, Nonsag, Neutral-Curing Silicone Joint Sealant: ASTM C920, Type S, Grade NS, Class 50, for Use NT.
 1. Products: The following, or equal:
 - a. Dow Corning Corporation; "DOWSIL 795 Building Sealant".
 - b. Sika Corporation, Construction Products Division; "Sikasil WS-295."
- C. Single-Component, Nonsag, Non-Bleed, Neutral-Curing Silicone Joint Sealant: ASTM C920, Type S, Grade NS, Class 50, for Use G, M, A and O.
 1. Products: The following, or equal:
 - a. The Dow Chemical Company; "DOWSIL 756 SMS."
 - b. Momentive Performance Materials; "SCS9000 SilPruf NB."
- D. Single-Component, Nonsag, One Part RTV Neutral-Curing Silicone Joint Sealant: ASTM C920, Type S, Grade NS, Class 25, designed for adhering to low energy surfaces common in sheet or peel and stick weather resistant barriers.
 1. Products: The following, or equal:
 - a. The Dow Chemical Company; "DOWSIL" 758.
 - b. Sika Corporation, Construction Products Division; "Sikasil-N Plus."
- E. Mildew-Resistant, Single-Component, Acid-Curing Silicone Joint Sealant: ASTM C920, Type S, Grade NS, Class 25, for Use NT, A and O.
 1. Products: The following, or equal:
 - a. The Dow Chemical Company; "DOWSIL 786 Mildew Resistant."

- b. Momentive Performance Materials; GE Silicones “Sanitary SCS1700.”

2.4 URETHANE JOINT SEALANTS

- A. Single-Component, Nonsag, Urethane Joint Sealant: ASTM C920, Type S, Grade NS, Class 35, for Use NT.
 - 1. Products: The following, or equal:
 - a. BASF Master Builders Solutions; “MasterSeal NP 1.”
 - b. Sika Corporation, Construction Products Division; “Sikaflex-1a.”
- B. Multicomponent, Nonsag, Urethane Joint Sealant: ASTM C920, Type M, Grade NS, Class 25, for Use NT, M, A and O.
 - 1. Products: The following, or equal:
 - a. BASF Master Builders Solutions; “MasterSeal NP 2.”
 - b. Sika Corporation, Construction Products Division; “Sikaflex-2c NS.”
- C. Multicomponent Urethane Joint Sealant: ASTM C920; self-leveling, Type M, Grade P, Class 25, Uses T, M, A, O, and approved by manufacturer for wide joints up to 1-1/2 inches.
 - 1. Products: The following or equal:
 - a. BASF Master Builders Solutions; “MasterSeal SL 2.”
 - b. Sika Corporation, Construction Products Division; “Sikaflex 2c SL.”

2.5 BUTYL JOINT SEALANTS

- A. Butyl-Rubber-Based Joint Sealants: ASTM C1311 and FS TT-S-001657, Type I.
 - 1. Products: The following, or equal:
 - a. Bostik, Inc.; “Chem-Calk 300.”
 - b. Pecora Corporation; “BC-158.”

2.6 ACRYLIC LATEX JOINT SEALANTS

- A. Latex Joint Sealant: Acrylic latex or siliconized acrylic latex, nonsag, paintable, nonstaining. ASTM C 834, Type OP, Grade NF.
 - 1. Products: The following, or equal:
 - a. Pecora Corporation; “AC-20.”
 - b. Sherwin Williams; 950A.

2.7 ACOUSTICAL JOINT SEALANTS

- A. Acoustical Sealant; ASTM C834, nonsag, paintable, nonstaining latex sealant. Effectively reduce airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E90.

JOINT SEALANTS
SECTION 07 9200
3595001

1. Products: The following, or equal:
 - a. Pecora Corporation; "AC-20" or "AC-20 FTR" (Fire and Temperature Rated).
 - b. United States Gypsum Company: USG "Sheetrock Acoustical Sealant,"

2.8 JOINT SEALANT BACKING

- A. General: Provide sealant backings of material and type that are nonstaining; are compatible with joint substrates, sealants, primers and other joint fillers; and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.
- B. Cylindrical Sealant Backer Rods: Compressible, non-gassing rod-stock complying with ASTM C1330; polyethylene-jacketed polyurethane foam; butyl-rubber foam; neoprene foam; or other flexible, permanent, durable, non-absorptive closed-cell (Type C), open cell (Type O), or bi-cellular material (Type B) and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.
 1. Open cell rods shall not be used at sealant joints for horizontal surfaces.
 2. Closed cell rods shall not be used at double sealant joints.
- C. Bond-Breaker Tape: Polyethylene tape or other plastic tape as recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint filler materials or joint surfaces at back of joint where such adhesion would result in sealant failure. Provide self-adhesive tape where applicable.

2.9 SEALANT ACCESSORIES AND ADDITIONAL MATERIALS

- A. Primer: Material recommended by joint sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint sealant-substrate tests **[and field tests]**.
- B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming in any way joint substrates and adjacent nonporous surfaces, and formulated to promote optimum adhesion of sealants with joint substrates.
- C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.
- D. Spall Repair Mortar: Two-component structural epoxy binder and sand aggregate, producing a mortar that is easily worked and troweled. Early-set system designed specifically for the repair of industrial concrete floors subject to hard wheeled traffic. Compatible with joint filler and recommended by the joint filler manufacturer in writing.
 1. Products: The following, or equal:
 - a. Metzger/McGuire: "Armor-Hard."

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting joint sealant performance. Do not proceed with installation of joint sealants until unsatisfactory conditions have been corrected.
- B. Commencement of work indicates acceptance of substrates.

3.2 PREPARATION

- A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with recommendations of joint sealant manufacturer and the following requirements:
 - 1. Remove foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.
 - 2. Clean concrete, masonry, unglazed surfaces of ceramic tile, and similar porous joint substrate surfaces by brushing, grinding, blast cleaning, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining from above cleaning operations by vacuuming or blowing out joints with oil-free compressed air.
 - 3. Remove laitance and form release agents from concrete.
 - 4. Clean metal, glass, porcelain enamel, glazed surfaces of ceramic tile, and other nonporous surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants.
- B. Spall Repair: Repair spalled joints in concrete slabs to produce joints of profiles recommended by joint sealer manufacturers.
- C. Joint Priming:
 - 1. Prime joint substrates where indicated or where recommended by joint sealant manufacturer based on preconstruction joint sealant-substrate tests or prior experience.
 - 2. Apply primer to comply with joint sealant manufacturer's recommendations. Confine primers to areas of joint sealant bond; do not allow spillage or migration onto adjoining surfaces.
- D. Masking Tape:
 - 1. Use masking tape where required to prevent contact of sealant with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears.

JOINT SEALANTS
SECTION 07 9200
3595001

2. Remove tape immediately after tooling without disturbing joint seal.
- E. Remove sealant and prepare joints in existing exterior locations as directed by representative of sealant manufacturer specified in this work.

3.3 INSTALLATION OF JOINT SEALANTS

- A. General:
 1. Comply with joint sealant manufacturer's printed installation instructions applicable to products and applications indicated, except where more stringent requirements apply.
 2. Seal around penetrations, holes, gaps, surface mounted fixtures and pipes entering building including light fixtures, mounting brackets and other similar items.
- B. Sealant Installation Standard: Comply with recommendations of ASTM C1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.
- C. Joint Sealants at Building Exterior and Interior:
 1. Seal the following joints with joint sealant:
 - a. Expansion and control joints in exterior walls, copings, parapets.
 - b. Joints between metal panels.
 - c. Joints between door and window frames and adjacent materials.
 - d. Joints between cabinets and countertops and walls.
 - e. Control joints in interior partitions, including portion above ceilings.
 - f. Expansion and control joints in solid exterior soffits.
 - g. Control joints in interior ceilings and soffits.
 2. Apply continuous bead of joint sealant in the following locations during installation of materials specified elsewhere:
 - a. In lap joints of sheet metal construction.
 - b. Roofing panels and roof-related sheet metal and flashing.
 - c. Between partition floor and ceiling tracks and adjacent construction.
 - d. Between end stud of partition and adjacent construction.
 - e. Under door sills and thresholds.
 - 1) Set sills and thresholds in continuous double bead of sealant.
 - 2) Provide sealant at butt ends of thresholds against door frame, around door frame and between threshold and resilient floor covering.
 3. Apply acoustic sealant at acoustic separations to make assembly airtight.
 - a. Seal perimeter and intersections of finish.
 - b. Seal around electrical boxes and other penetrations of finish; seal holes within electrical boxes; seal conduit ends.
 - c. Seal pipes which penetrate acoustic separations.
 4. Apply joint sealant at joints not specifically mentioned above which require sealant to meet the performance criteria cited in this Section.

- D. Installation of Sealant Backer Rods: Install sealant backer rods to comply with the following requirements:
1. Install joint fillers of type indicated to provide support of sealants during application and at position required to produce the cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
 - a. Do not leave gaps between ends of joint fillers.
 - b. Do not stretch, twist, puncture, or tear joint fillers.
 - c. Remove absorbent joint fillers that have become wet prior to sealant application and replace with dry material.
 2. Install bond breaker tape between sealants where backer rods are not used between sealants and joint fillers or back of joints.
- E. Sealant Installation:
1. Install sealants by proven techniques that result in sealants directly contacting and fully wetting joint substrates, completely filling recesses provided for each joint configuration, and providing uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.
 2. Install sealants at the same time sealant backings are installed.
- F. Tooling of Nonsag Sealants:
1. Immediately after sealant application and prior to time skinning or curing begins, tool sealants to form smooth, uniform beads of configuration indicated, to eliminate air pockets, and to ensure contact and adhesion of sealant with sides of joint. Remove excess sealants from surfaces adjacent to joint.
 2. Do not use tooling agents that discolor sealants or adjacent surfaces or are not approved by sealant manufacturer.
 3. Profiles:
 - a. Provide concave joint configuration in accordance with Figure 8A in ASTM C1193, unless otherwise indicated.
 - b. Provide flush joint configuration in accordance with Figure 8B in ASTM C1193, where indicated.
 - c. Provide recessed joint configuration in accordance with Figure 8C in ASTM C1193, of recess depth and at locations indicated.
 - 1) Use masking tape to protect adjacent surfaces of recessed tooled joints.
- G. Joint Fillers in Refrigerated Rooms:
1. Apply joint filler only after rooms have been brought down to the final temperature for five calendar days.
 2. Provide supplemental heat and dual dispensing system as required to apply in strict accordance with the manufacturer's directions.

JOINT SEALANTS

SECTION 07 9200

3595001

3.4 DEFECTIVE WORK

- A. Repair damaged and defective work and eliminate functional and visual defects. Where repair is not possible replace work. Adjust joints for uniform appearance.
- B. Cut out and remove damaged or deteriorated joint sealants immediately so that and installations with repaired areas are indistinguishable from original work.

3.5 CLEANING AND PROTECTION

- A. Clean off excess sealants or sealant smears adjacent to joints as work progresses by methods and with cleaning materials approved by manufacturers of joint sealants and of products in which joints occur.
- B. Clean excess adhesive from exposed surfaces of neoprene compression seal with solvent cleaner as recommended by manufacturer.
- C. Protect joint sealants during and after curing period from contact with contaminating substances or from damage resulting from construction operations or other causes so that they are without deterioration or damage at time of Substantial Completion.

3.6 SEALANT SCHEDULE

- A. General:
 - 1. Joints in construction between interior and exterior spaces and other designated or required locations to provide effective barrier against passage of elements:
 - a. Multicomponent, Nonsag, Urethane Joint Sealant: ASTM C920, Type M, Grade NS, Class 25, for Use NT, M, A and O.
 - b. Single-Component, Nonsag, Urethane Joint Sealant: ASTM C920, Type S, Grade NS, Class 25, for Use NT.
 - 2. Specialty perimeters where required for appearance or weather tightness:
 - a. Multicomponent, Nonsag, Urethane Joint Sealant: ASTM C920, Type M, Grade NS, Class 25, for Use NT, M, A and O; capable of 50 percent extension and compression movement.
 - b. Single-Component, Nonsag, Urethane Joint Sealant: ASTM C920, Type S, Grade NS, Class 35, for Use NT.
 - c. Single-Component, Nonsag, Neutral-Curing Silicone Joint Sealant: ASTM C920, Type S, Grade NS, Class 50, for Use NT.
 - d. Single-Component, Nonsag, Neutral-Curing Silicone Joint Sealant: ASTM C920, Type S, Grade NS, Class 100 / 50, for Use NT.
- B. Exterior Locations:
 - 1. Joints Bordered by Glass: Single-component, nonsag, neutral-curing silicone joint sealant, ASTM C920, Type S, Grade NS, Class 50, for Use NT.
 - 2. Joints Bordered by Plastic: Single-component, nonsag, neutral-curing silicone joint sealant, ASTM C920, Type S, Grade NS, Class 100 / 50, for Use NT.

3. Horizontal Joints in Exterior Walks Abutting Building Walls, Interior Concrete Floors: Multicomponent urethane sealant, self-leveling; ASTM C920, Grade P, Class 25, Uses T, M and A.
 - a. Where walks abut structural slabs or stoops.
 - b. Where walks abut exterior wall of buildings.
 - c. Where exposed interior concrete slabs abut vertical surfaces.
 - d. Where sealant is shown on the Drawings for concrete slabs.
4. Sheet Metal and Roof Accessory Sealants: Types recommended by roofing manufacturer and complying with requirements of this Section.
5. Exterior Sheet Metal Lap Joints: Types recommended by manufacturer and complying with requirements of this Section.
6. Joints Between Concrete Panels, and Between Concrete Panels and Other Work: Single-component, nonsag, neutral-curing silicone joint sealant, ASTM C920, Type S, Grade NS, Class 100 / 50, for Use NT and formulated to reduce or eliminate dirt pickup, surface streaking, and substrate staining.
7. Exterior Metal Panel Butt Joints and Trim: Types recommended by manufacturer and complying with requirements of this Section.
8. Sills and Thresholds: Butyl-rubber-based joint sealants, ASTM C1311.
9. All Other Exterior Joints:
 - a. Single-component, nonsag, neutral-curing silicone joint sealant, ASTM C920, Type S, Grade NS, Class 100 / 50, for Use NT.
 - b. Single-component, nonsag, neutral-curing silicone joint sealant, ASTM C920, Type S, Grade NS, Class 50, for Use NT.
 - c. Around perimeters of frames where door, window and louver frames abut concrete, masonry or other building materials.
 - d. Expansion and control joints in masonry.
 - e. Masonry at dissimilar material or at dissimilar masonry.
 - f. Miscellaneous locations where sealant is shown on Drawings.

C. Interior Locations:

1. Expansion and Control Joints:
 - a. Multicomponent, Nonsag, Urethane Joint Sealant: ASTM C920, Type M, Grade NS, Class 25, for Use NT, M, A and O.
 - b. Single-Component, Nonsag, Urethane Joint Sealant: ASTM C920, Type S, Grade NS, Class 35, for Use NT.
 - c. Around perimeters of frames where door, window and louver frames abut concrete, masonry or other building materials.
 - d. Expansion and control joints in masonry walls.
 - e. Masonry at dissimilar material or at dissimilar masonry.
 - f. At miscellaneous locations where sealant is shown on Drawings.
2. Sills and Thresholds: Butyl-Rubber-based joint sealants, ASTM C1311.

JOINT SEALANTS

SECTION 07 9200

3595001

3. Interior Wet Areas, Around Plumbing Fixtures, Countertops Abutting Walls, Food Service Applications: Mildew-resistant, single-component, acid-curing silicone joint sealant, ASTM C920, Type S, Grade NS, Class 25, for Use NT, A and O.
4. Interior Static Dry Joints as Required to Dress Appearance: Acrylic latex or siliconized acrylic latex joint sealant, ASTM C 834, Type OP, Grade NF
5. Sound Control Applications: Acoustical Sealant, ASTM C 834
 - a. Where Required for Sound Control with Limited Flame Spread: Acoustical sealant, ASTM C 834, fire-rated type.

END OF SECTION

*P:\Sacramento\3595 Tracy Unified School District\001-000_Villalovoz ES New Shade Structures\08 Specifications\06 SPEC\04
FINAL\Poet Christian\07 9200_Joint Sealants.docx
Last Updated: March 24, 2021*

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Painting and painter's finish on all exposed exterior and interior surfaces, except prefinished items and unless otherwise noted, as required to complete finishing of the Work. The Work includes, but is not necessarily limited to, the following specific items:
1. Paint, stain or otherwise finish all new surfaces.
 2. Back priming of concealed surfaces, except as otherwise specified.
 3. Paint, repaint or finish of existing painted surfaces altered, defaced or damaged as a result of work of this Contract.
 4. Paint site items which are not prefinished, including posts, screens, panels, bollards, supports, rails and other similar improvements.
 5. Mechanical and plumbing vents on roof.
 6. Unpainted or unfinished exposed building components, pipes and conduit, including sprinkler piping, and metal ductwork, which run exposed across finished or painted surfaces.
 7. Painting work in rooms where finishing work is performed, including painting new surfaces as specified and re-painting existing surfaces within the room, unless otherwise indicated. Re-painting existing surfaces shall be with minimum of one coat using specified coatings compatible with existing.
- B. Surface treatment, priming and coats of paint specified in this Section are in addition to shop priming and surface treatment specified under other Sections unless otherwise noted.
- C. Items Not Included in This Section:
1. Factory and shop-prefinished items as specified in various Sections.
 2. Painting specified elsewhere and included in respective Sections, including but not necessarily limited to shop priming.

1.2 WORK NOT TO BE PAINTED UNLESS OTHERWISE INDICATED

- A. Exposed exterior concrete and concrete slab surfaces, except as noted.
- B. Suspended acoustical ceilings and acoustical tile, except as noted.
- C. Pre-finished casework and other factory and shop-prefinished items as specified in various Sections.
- D. Finish hardware except prime coated items.
- E. Items typically not to be painted including, but not limited to, the following:
1. Glass.

PAINTING
SECTION 09 9100
3595001

2. Ceramic tile.
 3. Membrane roofing.
 4. Safety nosings.
 5. Resilient floor covering and base.
 6. Carpet.
 7. Pre-finished paneling.
 8. Plastic laminate.
 9. Porcelain enamel.
 10. Vinyl wallcovering, except where noted.
- F. Aluminum doors, windows, frames and railings.
- G. Metal or plastic toilet partitions.
- H. Items of chromium, copper, nickel, brass, bronze or stainless steel.
- I. Surfaces in concealed areas such as furred spaces.
- J. Tops of gravel stop flanges (including priming) where roofing material will be adhered to.
- K. Wall areas concealed by cases, counters, cabinets, chalkboards, tackboards (prime coat only required).
- L. Piping or conduit including brackets and similar items therewith running on or across unpainted or otherwise unfinished walls or ceilings.
- M. Galvanized gratings, recessed foot grilles, and thresholds.
- N. Structural steel scheduled to receive fireproofing.

1.3 RELATED REQUIREMENTS

- A. Section 01 6116, Volatile Organic Compound (VOC) Restrictions; for VOC limits pertaining to adhesives, sealants, fillers, primers, and coatings.
- B. Section 01 8113, Sustainable Design Requirements, for CAL-Green general requirements and procedures.
- C. Section 07 6200, Sheet Metal Flashing and Trim.
- D. Section 07 9200, Joint Sealants.
- E. Section 09 2900, Gypsum Board.
- F. Divisions 22, 23 and 26, Exposed piping, ductwork and conduit.

1.4 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).

- B. California Green Building Standards Code (CAL Green), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- C. ASTM International (ASTM):
 - 1. D523: Standard Test Method for Specular Gloss.
 - 2. D4263: Standard Test Method for Indicating Moisture in Concrete by the Plastic Sheet Method.
 - 3. D6386: Standard Practice for Preparation of Zinc (Hot-Dip Galvanized) Coated Iron and Steel Product and Hardware Surfaces for Painting.
 - 4. D7396: Standard Guide for Preparation of New, Continuous Zinc-Coated (Galvanized) Steel Surfaces for Painting.
- D. Master Painters Institute (MPI):
 - 1. Architectural Painting Manual Guide Specification.
- E. The Association for Materials Protection and Performance (AMPP):
 - 1. SSPC-Society for Protective Coatings/ National Association of Corrosion Engineers International (NACE):
 - a. SSPC-SP 1: Solvent Cleaning.
 - b. SSPC SP-10/NACE No. 2: Near-White Metal Blast Cleaning.
 - c. SSPC-SP 16: Brush-Off Blast Cleaning of Coated and Uncoated Galvanized Steel, Stainless Steels, and Non-Ferrous Metals.

1.5 ADMINISTRATIVE REQUIREMENTS

- A. Submittal Procedures:
 - 1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
 - 2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
 - 3. Sustainable Design Submittals shall comply with the additional requirement of Section 01 8113, Sustainable Design Requirements.

1.6 ACTION SUBMITTALS

- A. Product Data: Submit list and complete descriptive data of products proposed for use. Include manufacturer's specifications, published warranty or guarantee, and application instructions. Cross-reference to paint system and locations of application areas.
- B. Samples:
 - 1. Appropriately label and identify each sample, including location and application. Include **[Architect's number as scheduled on the Drawings,]** manufacturer's name, color number, and gloss units.
 - 2. Prepare on 8 inch x 10 inch card stock for selected colors and finishes.

PAINTING
SECTION 09 9100
3595001

3. Submit sufficiently ahead of work progress to allow for color board assembly and distribution.
4. Resubmit as requested until required sheen, color, and texture are approved.

1.7 INFORMATIONAL SUBMITTALS

- A. Statement of applicator qualifications.
- B. Sustainable Design:
 1. General:
 - a. Submit information necessary to establish and document compliance with the California Green Building Standards Code.
 - b. Sustainable design submittals are in addition to other submittals.
 2. The following information shall be provided:
 - a. Paints and Coatings: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.

1.8 CLOSEOUT SUBMITTALS

- A. Guarantee: Submit Subcontractor's guarantee.

1.9 MAINTENANCE MATERIAL SUBMITTALS

- A. At completion of the Work, deliver to Owner extra stock of paint of each color used in each coating material used.
- B. Containers shall be full, tightly sealed, and clearly marked.
- C. Provide the following quantities:
 1. Field Colors: 1 five-gallon container.
 2. Accent Colors: 1 one-gallon container.

1.10 QUALITY ASSURANCE

- A. Use only new materials and products.
- B. Single-Source Responsibility:
 1. To the maximum extent practicable, select a single manufacturer to provide all materials required by this Section, using additional manufacturers to provide systems not offered by the selected principal manufacturer.
 2. For each individual system:
 - a. Provide primer and other undercoat paint produced by same manufacturer as finish coat.
 - b. Use thinner within manufacturer's recommended limits.
- C. Source Quality Control: Material shall be best grade products of type specified and listed below as regularly manufactured by these manufacturers. Materials not bearing

manufacturer's identification as standard "best grade product" of their regular line will not be considered for use.

- D. Materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.
- E. Materials and application procedures shall comply with local, state and federal air pollution control regulations.
- F. Manufacturer's representative from coating supplier shall visit the site prior to application to review and approve the specified systems. Discrepancies or recommended changes shall be submitted to the Architect for consideration prior to finalization of submittal.
- G. Site Application Mockup:
 - 1. Prior to ordering materials and unless waived by the Architect in writing, the Contractor shall provide large scale mockup areas for all colors, both interior and exterior, directly applied to the building for final color approval by the Architect.
 - 2. Minimum Size:
 - a. Ceiling Areas: Finish a panel 10 feet square.
 - b. Wall Areas: Finish a panel 8 feet long by full height of wall.
 - c. Finish a portion of other items as directed by Architect.
 - 3. Provide up to 2 adjustments at no extra cost to the Owner.
 - 4. Paint shall not be ordered or applied until such large scale sample(s) have been reviewed and approved by the Architect in writing. These requirements as described herein may be waived by the Architect in writing only.

1.11 DELIVERY, STORAGE AND HANDLING

- A. Deliver undamaged products to job in manufacturer's sealed containers and/or original bundles with tags and labels intact.
- B. Store materials in protected, clean, dry conditions off of ground and in areas which will not interfere with the progress of the Work.
- C. Transport, store and handle in strict accordance with the manufacturer's written recommendations and as specified below.
- D. Remove paint-soiled rags and waste from premises at end of each day's work or store in metal containers with metal covers.
- E. Paint stored at site, shall be in separate structure not less than 60 feet from any other building or structure. Remove empty containers and soiled rags as they accumulate. At completion, remove structure, cleanup area, and leave in original condition.

PAINTING
SECTION 09 9100
3595001

1.12 FIELD CONDITIONS

- A. Do not apply paints and coatings under conditions which jeopardize quality or appearance of painting or finishing.
- B. Cover or otherwise protect finished work of other trades and surfaces not being painted concurrently or not to be painted.
- C. Exterior:
 - 1. Comply with manufacturer's recommendations as to environmental conditions under which coatings and coating systems can be stored and applied.
 - 2. Do not apply exterior paint when air or surface temperature is under 50 degrees F or when air or surface temperature will be below 50 degrees F for 48 hours after painting.
 - 3. Do not apply immediately following snow, rain, dew or during foggy weather.
 - 4. Do not apply when temperature is over 85 degrees F except in protected or shaded areas.
- D. Interior:
 - 1. Do not apply interior paint when air or surface temperature is below 50 degrees F unless temperature is maintained constantly.
 - 2. Do not apply when ventilation is inadequate to maintain humidity lower than dew point of coldest wall.
- E. Use moisture meter for determining proper moisture levels of surfaces for painting.
- F. Report to Architect in writing upon discovery of any prime coat painting specified in other Sections of Specifications that would prevent proper application of specified finish.
- G. Furnish, erect and remove scaffolding and planks required for work under this Section. Conform to state and local codes, rules and regulations.

1.13 EXISTING CONDITIONS

- A. Existing Surfaces:
 - 1. Paint or otherwise finish all existing surfaces as indicated or scheduled on the Drawings.
 - 2. Work includes primer, paint, repaint or finish of existing painted surfaces altered, defaced or damaged as a result of work under this Contract.
- B. Existing surfaces to be painted include:
 - 1. Exterior wall surfaces, including fascia, trim.
 - 2. Soffits and exterior ceilings including exposed roof framing.
 - 3. Doors and frames, both wood and metal.
 - 4. Window frames, trim and solid infill panels except unpainted or prefinished aluminum.

5. Exposed conduit, piping, brackets, supports, and similar metal fabrications.
6. Downspouts and gutters.
7. Parapet caps and exposed flashings.
8. Mechanical well walls, all surfaces.
9. Concrete foundation where exposed below painted wall surfaces.
10. Roll-up doors and frames.
11. Closure panels between relocatable buildings.
12. Enclosure walls, screen walls, equipment yards.
13. Other work as shown on the Drawings, specified, or as required for a complete Project.

1.14 GUARANTEE

- A. Contractor: Under conditions of its Guarantee under the Contract, paint colors shall be substantially unchanged and finishes shall maintain their original adherence without showing blisters, flaking, peeling, scaling, staining or unusual deterioration or other defects.

PART 2 - PRODUCTS

2.1 DESIGN AND PERFORMANCE CRITERIA

- A. Sustainable Design:
 1. VOC emissions for field-applied paints and coatings must comply with limits specified in Section 01 6116.

2.2 MANUFACTURERS AND COATING PRODUCTS

- A. Products are specified under "Paint Systems" in Part 3 below and are manufactured by Kelly-Moore, except as otherwise indicated. Equivalent products to those scheduled manufactured by Sherwin-Williams, PPG Architectural Finishes, Glidden Professional, Benjamin Moore & Co., Dunn-Edwards, Vista, or equal, are acceptable.
- B. Materials selected for coating systems for each type surface shall be the product of a single manufacturer or shall be acceptable to manufacturer of finish coating for system.
- C. If more than one quality level of product type is marketed, use material of highest quality.

2.3 MIXING AND TINTING

- A. Deliver paints and stains ready mixed to jobsite. On-site color mixing or tinting will not be allowed.
- B. Each kind of coating for paint finishes shall be factory-mixed to match approved samples, colors, and ready for immediate application.
- C. Mix proprietary products in strict accordance with manufacturer's printed directions.

PAINTING
SECTION 09 9100
3595001

- D. Thinning, if permitted by manufacturer for a specific coating, shall be in accordance with manufacturer's instructions. Thinning of other products shall be in accordance with standard practice.

2.4 COLORS

- A. Colors shall be as scheduled on the Drawings.
- B. Architect will prepare a color schedule with samples for guidance of painter and reserves right to select, allocate, and vary colors on different surfaces throughout building.
 - 1. Colors selected by Architect may be from manufacturer's full range standard palette or be custom mixed.
 - 2. Unless otherwise indicated on the Drawings, different colors will be selected for different materials such as walls, trim, and doors.
- C. Colors to be selected by the Architect, or where scheduled on the Drawings, are solely for the purpose of conveying color information and do not imply manufacturer's approval or waiver of the requirement that all coatings be from the same manufacturer, unless a specific system is not available from the primary manufacturer.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Prior to the work of this Section, carefully inspect and verify that the installed work of all other trades is complete to the point where this work may properly commence.
- B. Verify that painting may be performed in accordance with the approved design.
- C. In the event of discrepancy, immediately notify Architect. Do not proceed in discrepant areas until discrepancies have been fully resolved.

3.2 PREPARATION

- A. General:
 - 1. Surface preparation and product application shall be in accordance with manufacturer's printed instructions.
 - 2. In addition to prime coats indicated (primer, sealer, filler, undercoat), use two finish coats minimum, and additional coats as required for complete coverage and good appearance of scheduled finish coat.
 - 3. Surfaces to receive new finish shall be properly prepared prior to application of finish coatings.
 - 4. Do not apply paint, enamel, stains or varnishes to wet, damp, dusty, finger-marked, rough, unfinished, or defective surfaces until such defects have been corrected.
- B. Wood - Interior:

1. Thoroughly sandpaper and dust off woodwork; putty nail holes, cracks, and other defects after first coat to match color of paint. Putty where finish will be clear.
2. First coat on wood surfaces shall be sanded smooth. Other coats, except finish coat, shall be lightly sanded and dusted before and between each coat.
3. Smoothing, rubbing and sand-papering shall be sufficient to insure good results. Sand down all raised grain or rough surfaces and re-coat. Knots, pitch pockets and sappy portion of wood, all nail holes, cuts, cracks and other defects in wood shall have any necessary extra treatment to provide proper paint base.

C. Wood – Exterior:

1. Surfaces shall be dry and free of grease and splatters.
2. Rough surfaces shall be sanded smooth. **[Do not sandpaper resawn surfaces.]**
3. At opaque finish, fill nail holes, cracks, open joints, and other defects with filler after priming coat has dried. Exposed nail heads shall be spot primed.
4. Avoid painting surfaces while exposed directly to hot sun.
5. Smooth surfaces shall be sanded thoroughly to allow proper penetration and adhesion. Areas exhibiting tannic acid staining shall receive two coats of primer waiting 24 hours between coats. Sand and prime as soon as possible after installation to avoid UV degradation of unpainted wood surface.
6. Mildew, if present, shall be removed by scrubbing with a commercial mildew wash in accordance with manufacturer's directions.

D. Metals-General:

1. On metal work, only such sanding will be required as is necessary to provide for complete bonding of coats.
2. Steel and ironwork shall be scraped clean of scale, and rust and any grease shall be entirely removed.
3. Touch-up scratched and damaged places on metal priming coats.
4. Galvanized or zinc-coated metal shall be given an approved acid treatment 48 hours before paint is applied.
5. Prep and prime coat factory or shop primed metal products, including metal doors and frames, exposed framing, and other exposed metal if material was not shop primed.
6. Metal surfaces receiving epoxy coatings shall have stripe coat applied at all welds, edges, joints, etc., with epoxy primer prior to application of primer.

E. Metals–Galvanized Surfaces:

1. Surfaces shall be cleaned, and profiled where specified, prior to receiving applied coatings in accordance with ASTM D6386 or ASTM D7396 for sheet products.
 - a. Methods shall be selected based on age of galvanized coating, condition of surface and intended paint coating.
 - b. Care shall be taken not to damage the zinc coating.
 - c. Do not use phosphate treatment on galvanized surfaces scheduled to receive zinc-rich primers.

PAINTING
SECTION 09 9100
3595001

2. Comply with additional recommendations included in the AGA document "Duplex Systems: Painting Over Hot Dip Galvanized Steel."
3. Comply with any additional procedures required by the coating manufacturer.

3.3 REPAINTING EXISTING EXTERIOR SURFACES

A. General:

1. Exterior surfaces required to be re-painted, shall be power washed with surfactant, followed by rinsing to remove all loose coatings, chalk, dirt, efflorescence, oils, and other contaminants that would inhibit bond of new coating.
2. Mold or mildew shall be treated with bleach solution followed by thorough rinsing.
3. Protect openings into interior spaces during power washing including louvers, vents, vent screeds, grilles, to prevent water from entering interior areas including, attics and soffits.

B. Ferrous Metal: Steel framing, metal doors and frames, louvers, metal ductwork, and similar Items:

1. Remove all flaking, peeling and poorly bonded coatings, including rust from metal surfaces using power tool sanders or equivalent equipment. Feather edge remaining coatings.
2. Solvent scrub with MEK, all exposed bare metal, shop applied pretreatment and chalked coatings.
3. Spot prime exposed bare metal and metal pre-treatment prior to application of specified prime coat.

C. Galvanized Metal: Down spouts, wall caps, and Other Exposed Galvanized Metal.

1. Remove all loose, flaking or peeling coatings by scraping, chipping or sanding. Feather all rough edges by sanding.
2. Apply phosphoric acid etch pre-treatment to exposed galvanized metal.

D. Plaster:

1. Remove loose coatings using hand or power tools.
2. Patch plaster areas where original material has cracked, spalled or otherwise been removed with compatible material. Fill areas completely to provide smooth, even surface for refinishing. Spot prime patches prior to proceeding.
3. Patch masonry joints with cracks or missing material with compatible materials.

E. Wood Siding and Trim:

1. Remove loose, flaking or peeling coatings by scraping, chipping or sanding. Feather rough edges by sanding.
2. Surfaces that exhibit moderate to heavy chalk deposits shall be thoroughly cleaned to sound substrate by wire brushing, sanding, or power washing.
3. Spot prime bare wood, exposed nail and fastener heads prior to application of specified prime coat.

4. Glossy surfaces shall be dulled by sanding. Crystalline deposits shall be removed by flushing with water from a hose.
5. Mildew, if present, shall be removed by scrubbing with a commercial mildew wash in accordance with manufacturer's directions.

3.4 CAULKING

- A. Caulk all cracks in finished surfaces.
- B. Seal around any wall openings where original sealant is not fully sealing.
- C. Provide sealant at material transitions and intersections as required.

3.5 PROTECTION

- A. Hardware, fixture canopies, outlet covers, switch plates and other such items shall be removed or loosened and replaced after completing work as required for painting and finishing. Protect items until reinstalled.
- B. Protect work and work of others during progress against damage. Leave such work clean and whole. Correct damage by cleaning, repairing, replacing or repainting as directed.
- C. Provide necessary drop cloths for protection of work. Cover finished surfaces adjacent to work.

3.6 APPLICATION

- A. General:
 1. Do not apply initial coating until moisture content of surface is within limitations recommended by paint manufacturer.
 2. Apply coatings in accordance with manufacturer's recommendations and the additional requirements, as applicable, of the Architectural Painting Manual Guide Specifications for application methods and paint systems.
 3. Flow coat on evenly and well brushed in. Should dead spots occur, touch-up before next coat is applied. Should spots or cracks burn through after final coat is applied, apply additional coats to entire surface as necessary to remedy defects.
 4. Rate of application shall be within limits recommended by paint manufacturer for surface involved.
- B. Thicknesses: Rate of application shall be within limits recommended by paint manufacturer for surface involved and comply with the following.
 1. Paint materials shall be applied in manner to average 1.5 to 3 Dry Mills in thickness for the total number of coats scheduled.
 2. Provide Tooke Dry Mill Coating Inspection Gauge manufactured by Micro Metrics Company to the Project Inspector for inspection of finished coating systems, if requested.

PAINTING
SECTION 09 9100
3595001

- C. Refinish whole area where portion of finish is not acceptable.
- D. Adjust natural finishes as necessary to obtain identical appearance on veneers and solid stock.
- E. Equipment adjacent to walls shall be disconnected, using workers skilled in appropriate trades, and moved to permit wall surfaces to be painted. Following completion of painting, they shall be expertly replaced and reconnected.
- F. Top and bottom edges of all doors shall receive same paint system finish required for door faces.
- G. Do not paint over fire-rating labels, fusible links, or sprinkler heads.

3.7 DEFECTIVE WORK

- A. Painter shall be responsible for damage or unsuitable work, including that caused by improperly prepared surfaces. Refinishing shall be at no cost to the Owner. Repair work damaged during construction; touch-up or refinish as necessary any abraded, stained or otherwise damaged surfaces.

3.8 CLEANING AND PROTECTION

- A. Thoroughly clean any drips, splatters, spills, splashes, etc., from walls, floor or other surfaces, with no damage to those surfaces.
- B. Protect work and materials of this Section prior to and during installation, and protect the installed work and materials of other trades.
- C. In the event of damage, make all repairs and replacements necessary to the approval of the Architect at no additional cost to the Owner.

3.9 PAINT SYSTEMS

- A. General:
 - 1. Only major areas are scheduled, but miscellaneous and similar items and areas within room or space shall be treated with suitable system.
 - 2. This Specification shall serve as guide and is meant to establish procedure and quality. Confer with the Architect to determine exact finish desired.
 - 3. Number of coats scheduled is minimum. Additional coats shall be applied at no additional cost as required to hide base material completely, produce uniform color, and provide required and satisfactory finish.
- B. Gloss and Sheen Ratings: Paint gloss shall be defined as the sheen rating of applied paint, in accordance with the following limits in conformance with Master Painters Institute, Inc. (MPI) Standards according to ASTM D523. Not all of the Gloss Levels are necessarily scheduled or used on this Project.

Gloss Level	Description	Units @ 60 degrees	Units @ 85 degrees
G1	Matte or Flat finish	0 to 5	10 max.
G2	Velvet finish	0 to 10	10 to 35
G3	Eggshell finish	10 to 25	10 to 35
G4	Satin finish	20 to 35	35 min.
G5	Semi-Gloss finish	35 to 70	
G6	Gloss finish	70 to 85	
G7	High-Gloss finish	> 85	

C. Clarification of System Terminology:

1. Interior paint Systems are specified and identified herein by initial letters "INT."
2. Exterior paint Systems are specified and identified herein by initial letters "EXT."
3. The numbers following "INT" and "EXT" for each System identifies the substrate to be coated.
4. Initial numbers for each System identify the substrate to be coated summarized as follows with further clarification included with the System description:

CODE	DESCRIPTION
3.1	Concrete
3.2	Cement Plaster
4	Masonry
5	Metal
6	Wood
9.2	Gypsum Board
9.3	Acoustical Panels and Tile

5. The letter following substrate number identifies the general finish coat chemistry summarized as follows:

CODE	DESCRIPTION
A	Standard acrylic
B	Non-bridging vinyl acrylic
C	Epoxy-like acrylic
D	Semi-transparent stain
E	Elastomeric
F	High performance epoxy-like acrylic
G	Lacquer
H	Aliphatic urethane
I	Fire Retardant Intumescent
J	Acrylic Urethane
K	PVA primer
L	Acrylic primer
M	Premium performance acrylic polymer

6. Hyphenated suffix identifies the topcoat gloss level.

PAINTING
SECTION 09 9100
3595001

3.10 INTERIOR PAINTING SYSTEMS

INT 5.1A-5

Acrylic on Exposed Steel, Not Shop Primed - Gloss Level 5

1 coat	5725 DTM	Acrylic Primer
2 coats	1050 Premium Professional	Latex Semi-Gloss

Note: Modify scheduled finish coat if lower gloss level is selected by Architect.

INT 5.2A-5

Acrylic on Shop Primed Metal Including Hollow Metal Doors & Frames - Gloss Level 5

2 coats	1050 Premium Professional	Latex Semi-Gloss
---------	---------------------------	------------------

Note: Modify scheduled finish coat if higher or lower gloss level is selected by Architect.

INT 5.2M-6

Premium Performance Acrylic on Exposed Metal - Gloss Level 6

1 coat	Devacryl 1440	Waterborne Acrylic
2 coats	Devacryl 1449	100% Acrylic-Gloss

INT 9.2A-1

Acrylic on Gypsum Board - Gloss Level 1; at theater stage

1 coat	971 AcryPlex	PVA Primer/Sealer
2 coats	Speedhide 6-753 by PPG Architectural Finishes	Acrylic Latex Flat Black

INT 9.2A-3

Acrylic on Gypsum Board, textured finish - Gloss Level 3

1 coat	971 AcryPlex	PVA Primer/Sealer
2 coats	1010 Premium Professional	Latex Eggshell

INT 9.2A-5

Acrylic on Gypsum Board, smooth finish - Gloss Level 5

1 coat	971 AcryPlex	PVA Primer/Sealer
2 coats	1050 Premium Professional	Latex Semi-Gloss

Note: Provide additional topcoat at toilet rooms and food service areas.

INT 9.3B-1

Acrylic on Acoustic Panels and Tiles - Gloss Level 1

1 coat	1005 Ceiling Paint	Non-Bridging Vinyl Acrylic Flat
--------	--------------------	---------------------------------

3.11 EXTERIOR PAINTING SYSTEMS

EXT 3.2A-2

Acrylic on Cement Plaster - Gloss Level 2

1 coat	247 AcryShield	Acrylic Masonry Primer
2 coats	1210 Premium Professional	100% Acrylic Low Sheen

EXT 5.1A-5

Acrylic over Unprimed Steel - Gloss Level 5

1 coat	5725 DTM	Metal Primer
2 coats	1215 Premium Professional	100% Acrylic Semi-Gloss

EXT 5.2A-5

Acrylic over Shop Primed Metal Doors and Frames, Steel Frame, Mechanical and Electrical Equipment, and Panels - Gloss Level 5

2 coats	2888 DuraPoxy HP	Acrylic Urethane Semi-Gloss
---------	------------------	-----------------------------

EXT 5.3A-5

Premium Acrylic over Waterborne Primer on Galvanized Metal – Gloss Level 5

Pretreatment	SSPC SP-1	Heavy-duty cleaner
1 coat	5725 DTM	Acrylic Primer
2 coats	1215 Premium Professional	100% Acrylic Semi-Gloss

Note: Provide pretreatment and primer if preparation and primer not applied in shop.

EXT 5.4A-5

Acrylic over Waterborne Primer on Aluminum – Gloss Level 5

Pretreatment	Devco Devprep 88	Heavy-duty cleaner
1 coat	5725 DTM	Acrylic Primer
2 coats	1215 Premium Professional	100% Acrylic Semi-Gloss

Note: Provide pretreatment and primer if preparation and primer not applied in shop.

3.12 MISCELLANEOUS PAINTING

- A. Mechanical and Electrical Equipment, Conduits and Piping: Paint exposed items as scheduled using appropriate system for material and whether or not item has been factory-primed.
- B. Exposed Insulation-Covered Piping: Size with Arabol, or equal latex type adhesive, and apply 2 coats of semi-gloss enamel.
- C. Material Visible through Grilles, Screens, Louvers, Vents and Screens and Exposed Hardware Cloth Screening: Painted flat black to make them as unnoticeable as possible.
- D. Mechanical Equipment: Paint mechanical equipment housings where indicated on the Drawings.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Metal-framed porcelain enamel markerboards.
 - 2. Horizontal sliding markerboards.

1.2 RELATED REQUIREMENTS

- A. Section 01 6116, Volatile Organic Compound (VOC) Restrictions; for VOC limits pertaining to adhesives, sealants, fillers, primers, and coatings.
- B. Section 01 8113, Sustainable Design Requirements, for CAL-Green general requirements and procedures.
- C. Section 12 3216, Manufactured Plastic-Laminate-Clad Casework.

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CAL Green), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Submittal Procedures:
 - 1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
 - 2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Contract Closeout and Final Cleaning.
 - 3. Sustainable Design Submittals shall comply with the additional requirement of Section 01 8113, Sustainable Design Requirements.

1.5 ACTION SUBMITTALS

- A. Shop Drawings: Submit showing all parts, connections and anchorages, adjacent materials, fully dimensioned and noted. Include in-wall blocking requirements.
- B. Product Data: Manufacturer's complete descriptive data of all products proposed for use. Include manufacturer's specifications, installation instructions, and maintenance instructions.
- C. Samples: The following samples are required.
 - 1. Submit sample for each type of board and trim components to Architect for review.

MARKERBOARDS
SECTION 10 1116
3595001

2. Manufacturer's full range of colors for Architect's selection.

1.6 INFORMATIONAL SUBMITTALS

A. Sustainable Design:

1. General:
 - a. Submit information necessary to establish and document compliance with the California Green Building Standards Code.
 - b. Sustainable design submittals are in addition to other submittals.
2. The following information shall be provided:
 - a. Adhesives and Sealants: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.
 - b. Composite Wood: Evidence of compliance that products meet formaldehyde limits of current CARB Airborne Toxic Control Measure (ATCM) as specified in Section 01 6116.

B. Sample of manufacturer's warranty.

1.7 CLOSEOUT SUBMITTALS

- A. Warranty/Guarantee: Submit executed warranty and Subcontractor's guarantee.

1.8 QUALITY ASSURANCE

- A. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.
- B. Single Source Responsibility: Use materials and products of one manufacturer whenever possible.
- C. Materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.

1.9 DELIVERY, STORAGE AND HANDLING

- A. Deliver undamaged products to job in manufacturer's sealed containers and/or original bundles with tags and labels intact.
- B. Store materials in protected, dry conditions off of ground and in areas so as to not interfere with the progress of the work.
- C. Transport, store and handle in strict accord with the manufacturer's written recommendations.

1.10 WARRANTY

- A. Manufacturer: In addition to the Contractor's and Subcontractor's Guarantee, furnish Owner with the following manufacturer's fully executed written warranties against defects in materials and workmanship including against warping of sliding panel units.

1. Dry Erase Markerboards: Lifetime of the building.
2. Other Products: As available from the manufacturer.

PART 2 - PRODUCTS

2.1 DESIGN AND PERFORMANCE CRITERIA

- A. Sustainable Design:
1. VOC emissions for field-applied adhesives, sealants, and sealant primers must comply with limits specified in Section 01 6116.
 2. Composite wood products must meet current formaldehyde emission limits of CARB Airborne Toxic Control Measure (ATCM) as specified in Section 01 6116.

2.2 HORIZONTAL SLIDING MARKERBOARDS

- A. Manufacturer and Product: Top hung sliding panels and fixed back panels; "Horizontal Sliding Units" by Claridge Products and Equipment, Inc., 800-434-4610 as specified, or equal.
1. Frame: Frame and exposed metal members to be of 6063-T5 alloy, anodized satin finish, aluminum extrusions.
 2. Tray: 2-3/4 inch deep aluminum tray with end closures.
 3. Map Rail: Full length aluminum map rail with cork insert furnished with one combination hook/clip for each 24 inch of length and two flag holders.
 4. Hardware: Rolling hardware to be nylon tipped, ball bearing rollers of sufficient size and number to enable smooth and easy operation of panels.
 5. Tracks: As standard with manufacturer for number of panels at each configuration.
 6. Panel Finish: Sliding panel units and back fixed panel shall be specified markerboard.
 7. Dimensions:
 - a. Overall Size: Typical units, unless indicated otherwise, shall be 3 panels 7'-0" wide x 4'-0" high each.
 - b. Where other sizes are shown, markerboards within sliding Units shall not exceed 5'-6" in width.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Prior to installation, carefully examine and verify that the installed work of all other trades is complete to the point where this installation may properly commence.
- B. Verify that specified items may be installed in accord with the approved designs.
- C. In the event of discrepancy, immediately notify Architect. Do not proceed in discrepant areas until discrepancies have been fully resolved.

MARKERBOARDS

SECTION 10 1116

3595001

3.2 INSTALLATION – MARKERBOARDS

- A. Install items where indicated on the Drawings, in full accord with all reviewed shop drawings and the manufacturer's recommendations, anchoring components firmly in place for long life under hard use.

3.3 PROTECTION

- A. Protect work and materials of this Section prior to and during installation, and protect the installed work and materials of other trades.
- B. In the event of damage, make all repairs and replacements necessary to the approval of the Architect at no additional cost to the Owner.

END OF SECTION

*p:\sacramento\3595 tracy unified school district\001-000_villalovoz es new shade structures\08 specifications\06 spec\04 final\poet christian\10 1116_markerboards.docx
Last Updated: March 30, 2021*

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Code required signage.
 - 2. Exterior building identification and other non-code signage.

1.2 RELATED REQUIREMENTS

- A. Section 01 6116, Volatile Organic Compound (VOC) Restrictions; for VOC limits pertaining to adhesives, sealants, fillers, primers, and coatings.
- B. Section 01 8113, Sustainable Design Requirements, for CAL-Green general requirements and procedures.
- C. Division 26, Electrical.
- D. Signage requirements included on the Drawings.

1.3 REFERENCES AND STANDARDS

- A. California Building Code, edition as noted on the drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CAL Green), edition as noted on drawings, as adopted by the California Division of the State Architect (DSA).
- C. Title 19, CCR, Article 33.01(i).
- D. American National Standards Institute (ANSI):
 - 1. A-117.1: Accessible and Usable Buildings and Facilities.
- E. ASTM International (ASTM):
 - 1. A53/A53M: Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
 - 2. A153/A153M: Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Submittal Procedures:
 - 1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.

SIGNAGE
SECTION 10 1400
3595001

2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
3. Sustainable Design Submittals shall comply with the additional requirement of Section 01 8113, Sustainable Design Requirements.

B. Coordination:

1. Prior to production of shop drawings and samples, coordinate a pre-submittal conference with Architect to confirm submittal requirements, schedule, and sign review process.
2. For signs supported by or anchored to permanent construction, advise installers of anchorage devices about specific requirements for placement of anchorage devices and similar items to be used for attaching signs. Provide template for placement of sign-anchorage devices and electrical service embedded in permanent construction by other installers.

1.5 ACTION SUBMITTALS

A. Shop Drawings:

1. Scaled drawings and signage schedule for each sign indicating materials, lettering layout, and colors.
2. Large-scale drawing and details of custom logo and lettering. Include mounting details.
 - a. Include plans, elevations, and large-scale sections of typical members and other components.
 - b. Show mounting methods, grounds, mounting heights, layout, spacing, reinforcement, accessories, and installation details.
3. Font Style. 18 point graphical example of alphabet and numerical numbers 0 through 9 of signage font style, upper and lower case letters, punctuation, 18 point scale, and black text on white paper.

B. Product Data: Submit list and complete descriptive data of all products proposed for use. Include manufacturer's specifications, published warranty or guarantee, installation instructions, and maintenance instructions.

C. Samples:

1. Submit three samples of specified signage fonts to be used for visual and tactile characters including braille below the raised characters.
2. Color Verification: Provide physical sample of each available color from the manufacturer. Include color system name and serial number, code and name as applicable.
3. Control Samples. Samples shall be prepared on same base material to be used in fabrication. Submit one sample of each sign type. Signage types are indicated in Construction Document details. Interior signs shall be full size.

4. Dimensional Letters: One full-size representative samples of each dimensional letter type required, showing letter style, color, and material finish and method of attachment.
5. Symbol of Accessibility and Pictograms. Full scale sample of pictograms and symbol of accessibility to be used on sign panels and graphics.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For installer.
- B. Sustainable Design:
 1. General:
 - a. Submit information necessary to establish and document compliance with the California Green Building Standards Code.
 - b. Sustainable design submittals are in addition to other submittals.
 2. The following information shall be provided:
 - a. Adhesives and Sealants: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.
- C. Sample of manufacturer's warranty.
- D. Signage Schedule and Alphanumeric Nomenclature. As a component of shop drawings and informational submittals, verify with Architect the sign nomenclature; room names and numbers; wording of way-finding, directional and informational signage; text; and orientation of wayfinding pictorial graphics.

1.7 CLOSEOUT SUBMITTALS

- A. Warranty/Guarantee: Submit executed warranty and Subcontractor's guarantee.
- B. Maintenance data for signs and sign types including maintenance manuals.

1.8 QUALITY ASSURANCE

- A. Contractor shall assure that the vendor shall be responsible for the quality of materials and workmanship of any firm acting as the vendor's subcontractor.
- B. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.
- C. Use materials and products of one manufacturer whenever possible.
- D. Materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.
- E. The adhesion of inlaid letters and symbols will be tested. See Article WARRANTY.
- F. Mockups:

SIGNAGE
SECTION 10 1400
3595001

1. Prior to installation, provide a taping pattern for sign plaques.

1.9 DELIVERY, STORAGE AND HANDLING

- A. Deliver undamaged products to job in manufacturer's sealed containers and/or original bundles with tags and labels intact.
- B. Store materials in protected, dry conditions off of ground and in areas so as to not interfere with the progress of the work.
- C. Transport, store and handle in strict accord with the manufacturer's written recommendations.

1.10 FIELD MEASUREMENTS

- A. Make and be responsible for all field dimensions necessary for proper fitting and completion of work. Report discrepancies to Architect before proceeding.

1.11 WARRANTY

- A. Manufacturer: In addition to the Contractor's and Subcontractor's Guarantee, furnish Owner with manufacturer's available fully executed written warranty for signage against all defects in materials and workmanship, including without limitation against yellowing, cracking, crazing, and other visible and performance defects for a period of 5 years.
 1. Text, pictograms or symbols that can be removed from the sign face utilizing a sharp object or other conventional methods will be considered a manufacturing defect.

PART 2 - PRODUCTS

2.1 DESIGN AND PERFORMANCE CRITERIA

- A. Regulatory Standards:
 1. Except as otherwise specified or shown, signage shall conform to the following:
 - a. ANSI A-117.1 and the Americans with Disabilities Act (ADA).
 - b. ATBCB Design Guidelines for Signage in relation to the Americans with Disabilities Act.
 - c. California Code of Regulations, Titles 19 and 24.
 - 1) Contracted Grade 2 Braille shall be used whenever Braille symbols are specifically required. Refer to CBC Section 11B-703.3.
 - 2) All signage shall conform to 2022 CBC Section 11B-703.
 - d. Uniform Sign Code.
 2. When there is a conflict between the CBC and ADA, comply with the most stringent.
- B. Design Criteria: Refer to Chapter 11B of the California Building Code.

1. Raised Characters: Section 11B-703.2.
 - a. Depth: Section 11B-703.2.1.
 - b. Case: Section 11B-703.2.2.
 - c. Style: Section 11B-703.2.3.
 - d. Character Proportions: Section 11B703.2.4.
 - e. Character Height: Section 11B-703.2.5.
 - f. Stroke Thickness: Section 11B-703.2.6.
 - g. Character Spacing: Section 11B-703.2.7.
 - h. Line Spacing: Section 11B-703.2.8.
 - i. Installation Height and Location: Section 11B-703.4.
 2. Braille: Section 11B-703.3.
 - a. Contracted (Grade 2) Braille with rounded or domed dots shall be used wherever Braille is required.
 - 1) Braille dimensions in accordance with Table 11B-703.3.1.
 3. Visual Characters: Section 11B-703.5.
 - a. Character Proportions: Section 11B-703.5.4.
 - b. Stroke Thickness: Section 11B-703.5.7.
 - c. Character Spacing: Section 11B-703.5.8.
 - d. Line Spacing: Section 11B-703.5.9.
 4. Pictograms: Section 11B-703.6.
 - a. Pictogram Field: 11B-703.6.1.
 - 1) Characters and Braille shall not be located in the pictogram field.
 - b. Finish and Contrast: Section 11B-703.6.2.
 - 1) Pictograms and their field shall have a non-glare finish. Pictograms shall contrast with their field with either a light pictogram on a dark field or a dark pictogram on a light field.
 - c. Text Descriptors: Section 11B-703.6.3.
 - 1) Locate text descriptors directly below the pictogram field.
 - 2) Text shall be raised characters with braille directly below.
 5. International Symbol of Accessibility: Section 11B-703.7.2.1.
 6. Toilet Room Door Symbols: Section 11B-703.7.2.6.
 7. Tactile Exit Signs: Tactile exit signage to comply with 1013.4 and 11B-703.4.
- C. Sustainable Design:
1. VOC emissions for field-applied adhesives, sealants, and sealant primers must comply with limits specified in Section 01 6116.

2.2 PLASTIC SIGNS - TACTILE

- A. Materials, Unless Otherwise Noted:

SIGNAGE
SECTION 10 1400
3595001

1. Manufacturer and Product: "Inlaid Tactile Sign" by Accent Signage Systems, Inc. Minneapolis, MN, 800-215-9437 as specified and the basis of design; Ellis & Ellis Sign Systems, Sacramento, CA, 916-924-1936; ASI-Modulex, Los Altos, CA, 650-940-1354; Weidner Architectural Signage, Sacramento, CA; or equal.
 - a. Sign Face: Two 1/8-inch plies with eased edges; New Hermes "Gravo-Tac," or equal.
 - 1) Total Thickness: 1/4 inch.
 - 2) Painted signs will not be accepted.
 - b. Tactile Text: Provide tactile text and "Raster" Braille at plastic tactile signage.
 - 1) Tactile text shall be inlaid into sign face 1/32-inch and raised 1/32- inch minimum above sign face surface.
 - 2) Inlaid text shall be 1-ply, 1/16-inch thick material; "Gravo-Tac" Exterior or equal.
 - 3) Provide text and graphics precisely formed, uniformly opaque to comply with relevant ADA regulations and requirements indicated for size, style, spacing, content, position and colors.
 - 4) Symbols where specified shall be International Style.
 - 5) Braille shall be Contracted (Grade 2) Braille.
 - a) Dots shall be 0.10-inch on centers in each cell, 0.30-inch on center between corresponding dots in adjacent cells, and 0.395-inch minimum to 0.400-inch maximum on center between corresponding dots in cell directly below.
 - b) Dots shall be raised a minimum of 0.025-inch and a maximum of 0.037-inch above the background, and a base diameter of 0.059-inch minimum and 0.063- inch maximum.
 - c) Dots with straight sides and flat tops are not acceptable.
 - c. Colors: High contrast, non-glare, integral colors for graphics.
 - 1) Integral materials shall be U.V. stabilized.
 - 2) Characters, symbols and pictograms shall be in high contrast (light color) with background (dark) color and must conform to the CBC and the ADA Standards.

B. Fabrication:

1. Panel Appearance: Manufacturer's standard, high contrast, semi-matte colors.
2. Surface Texture: Matte Non-glare.
3. Character Style, Size and Layout Position:
 - a. Characters shall be 1-inch high, unless otherwise indicated.
 - b. The stroke of the uppercase letter "I" shall be 15 percent maximum of the height of the character.
 - c. The width of the uppercase letter "O" shall be 60 percent minimum and 110 percent maximum of the height of the uppercase letter "I".

SIGNAGE
SECTION 10 1400
3595001

- d. Character style to be Sans Serif, uppercase, accompanied by Braille directly below text at all locations where raised characters are required.
 - e. Spacing between baselines of separate lines of raised characters with a message shall be 135 percent minimum and 170 percent maximum of the raised character height.
 - 4. Text Schedule: Confirm text, symbols and numbering with the Architect and Owner.
 - 5. Sign Size: As indicated on the Drawings or, if not shown, as reasonably required to accommodate text, symbols and Braille.
 - a. Where signs are installed on window glazing, fabricate a blank sign back to match in size and shape to sign.
 - b. Sign backs shall cover back side of sign from view through window on opposite side of sign.
 - c. Signs that are mounted back-to-back on glazing are to be matching in size; the smaller sign is to be increased in size as reasonably required to match the larger sign.
 - 6. Sign Shape: As indicated on the Drawings.
 - a. Corners: Radiused, unless otherwise shown.
 - 7. Inlaid Letter Adhesion Process: Inlaid material shall be adhered into 1/32-inch deep routed sign face utilizing the heat and pressure bonded/chemically welded process as developed by Accent Signage Systems for the specified "Inlaid Tactile Sign."
 - a. Sign manufacturers for the specified "Inlaid Tactile Sign" shall be familiar with and utilize the exact same manufacturing process developed by Accent Signage Systems.
 - b. Manufacturer must utilize the same and required equipment, products and techniques necessary to produce authentic "Inlaid Tactile Signs" as developed by Accent Signage Systems.
 - c. Other adhesive products and methods, including applied adhesive tapes will not be accepted.
- C. Sign Types: Provide braille translation directly below the raised characters.
- 1. Room Identification Sign: Provide as shown on the Drawings.
 - a. Provide name and room number at each door indicated.
 - b. Names and numbers to be reviewed and approved by Architect and Owner prior to fabrication.
 - c. Allow an average of 4-numbers and 14-letters for each sign.
 - d. Sign to be provided adjacent to doors as shown.
 - 2. Toilet Room Identification Sign: In addition to the specified Door Symbol, provide a Toilet Room Identification Sign at the strike side of every toilet room door.
 - a. Sign shall include an International Symbol of Accessibility, pictogram, and raised characters, specifying the room name with Braille translation below pictogram.
 - 3. Tactile Exit Sign:

SIGNAGE
SECTION 10 1400
3595001

- a. Provide with text in raised characters to read: "EXIT".

2.3 PLASTIC SIGNS - NON-TACTILE

A. Materials, Unless Otherwise Noted:

Manufacturer and Product: Acrylic panel sign as manufactured and distributed by Ellis & Ellis Sign Systems, 916-924-1936, as specified and the basis of design, or equal.

1. Sign Face: 1/4-inch, matt finish, non-glare acrylic with subsurface vinyl and paint. Painted faces will not be accepted.
2. Colors: Colors shall match specified Tactile Signs and as selected by Architect and Owner.
 - a. Integral materials shall be U.V. stabilized.
 - b. Graphics and text shall be in high contrast (dark color) with background (light) color.

B. Fabrication:

1. Sign Thickness: 1/4-inch.
2. Character Style, Size and Layout Position:
 - a. Characters shall be a minimum of 1-inch high, unless otherwise indicated.
 - b. The stroke thickness of the uppercase letter "I" shall be 10 percent minimum and 20 percent maximum of the height of the character.
 - c. The width of the uppercase letter "O" shall be 60 percent minimum and 110 percent maximum of the height of the uppercase letter "I".
 - d. Letter style to be Sans Serif, uppercase.
 - e. Space characters 10 percent minimum and 35 percent maximum of height of characters, measured between two closest points of adjacent characters, excluding word spaces.
 - f. Spacing between baselines of separate lines of characters within a message shall be 135 percent minimum and 170 percent maximum of character height.
3. Text Schedule: Confirm text, symbols and numbering Architect and Owner using the shop drawing/submittal process.
4. Sign Size: As indicated on the Drawings or, if not shown, as reasonably required to accommodate text and symbols.
 - a. Where signs are installed on window glazing, fabricate a blank sign back to match in size and shape to sign.
 - b. Sign backs will cover back side of sign from view through window on opposite side of sign.
5. Sign Shape: As indicated on the Drawings or, as reasonably required to accommodate the specified text and size at lettering.
 - a. Corners: 1/4-inch radius, unless otherwise shown.

C. Sign Types:

1. Toilet Room Door Symbol: Provide one of the following symbols as appropriate to the toilet room type. Toilet Room Door Symbols shall have a color contrast that is distinctly different from the color of the door. Characters, as shown, to be flush with face of symbol. The entire background color must contrast with door. A thin contrasting border around the symbol, with remainder of sign background in a non-contrasting color is not allowed.
 - a. Girls: 12-inch diameter circle, with eased edges.
 - b. Boys: Equilateral triangle with sides 12-inches long, with eased edges.
 - c. Women: 12-inch diameter circle, with eased edges.
 - d. Men: Equilateral triangle with sides 12-inches long, with eased edges.
 - e. Unisex or Staff: equilateral triangle of contrasting color and super imposed on and geometrically inscribed within the face of 12-inch diameter circle, which is a contrasting color to the door. The vertices of the triangle symbol shall be located $\frac{1}{4}$ -inch maximum from the edge of the circle with the vertex pointing upward. Both the circle and triangle to have eased edges.
2. Occupancy Signs (Capacity Sign): Quantity of occupants shall be as indicated on the Drawings or as provided by Architect. Text to read as follows:
 - a. Maximum Number - General: "The number of people permitted in this room shall not exceed _____ by order of the Division of the State Architect."
 - b. Rooms Used for Assembly and Dining: "The number of people permitted in this room shall not exceed _____ for Assembly and _____ for Dining by order of the Division of the State Architect."
3. Assistive Listening System Sign: Provide as indicated on the Drawings.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Prior to installation, carefully inspect and verify that the installed work of other trades is complete to the point where this installation may properly commence.
- B. Verify that specified items may be installed in accordance with the approved design.
- C. In the event of discrepancy, immediately notify Architect. Do not proceed in discrepant areas until discrepancies have been fully resolved.

3.2 INSTALLATION OF SIGNS

- A. General: Locations of signs must be in accordance with the Drawings and approved shop drawings.
- B. Plastic Signs:
 1. General:
 - a. Provide both mechanical fasteners and either adhesive or 2-sided adhesive tape as recommended by manufacturer for given mounting substrate.

SIGNAGE
SECTION 10 1400
3595001

- b. Fasteners: Minimum 4-recessed flush head tamper-proof (vandal-resistant) screws per sign.
- 2. Wood and Metal Framed Walls: Mechanical fasteners shall be of adequate length to penetrate exterior finishes and provide secure embedment into wall structure or sheathing.
- 3. Concrete Walls:
 - a. Use vinyl tape and mounting holes for countersunk, vandal-proof expansion anchors (use both).
- 4. Glass:
 - a. Utilize mounting adhesive and silicone where signs are mounted to glass.
 - b. Provide vinyl window sign backer to match sign face size, mounted on opposite side of glass.
 - c. Signs mounted back-to-back are to be matching in size.
 - d. Do not pre-drill signs for mechanical fastening where sign is to be mounted to glass.
- C. Other Signs: Use mounting method that is permanent, vandal resistant, and has been approved by the Architect.

3.3 PROTECTION

- A. Protect work and materials of this Section and other Sections prior to and during installation, and protect the installed work and materials of all other trades.
- B. In the event of damage, immediately make all repairs and replacements necessary to the approval of the Architect and at no additional cost to the Owner.

3.4 ADJUSTING AND CLEANING

- A. Remove all dust, dirt, finger marks, etc. from signs and letters using cleaning methods as recommended by manufacturer.

END OF SECTION

p:\sacramento\3595 tracy unified school district\001-000_villalovoz es new shade structures\08 specifications\06 spec\04 final\poet christian\10 1400_ signage.docx
Last Updated: March 30, 2021

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Toilet accessories.

1.2 RELATED REQUIREMENTS

- A. Division 26, Electrical.

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CAL Green), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Submittal Procedures:
 - 1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
 - 2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
- B. Coordination: Coordinate with other trades as required to ensure proper and adequate provision in framing and wall finish for the installation of the selected toilet accessories in the locations required including recessed items)

1.5 ACTION SUBMITTALS

- A. Shop Drawings: Submit showing parts, connections and anchorages, adjacent materials, fully dimensioned and noted.
- B. Product Data: Submit list of each required accessory and complete descriptive data of products proposed for use. Include manufacturer's specifications, published warranty, installation instructions, and maintenance instructions.

1.6 INFORMATIONAL SUBMITTALS

- A. Sample of manufacturer's warranty.

1.7 CLOSEOUT SUBMITTALS

- A. Warranty/Guarantee: Submit executed warranty and Subcontractor's guarantee.

TOILET ACCESSORIES
SECTION 10 2813
3595001

- B. Keys for lockable accessories.
- C. Maintenance data and operating instructions.

1.8 QUALITY ASSURANCE

- A. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.
- B. Use materials and products of one manufacturer whenever possible.
- C. All materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.

1.9 DELIVERY, STORAGE AND HANDLING

- A. Deliver undamaged products to job in manufacturer's sealed containers and/or original bundles with tags and labels intact.
- B. Store materials in protected, dry conditions off of ground and in areas so as to not interfere with the progress of the Work.
- C. Transport, store and handle in strict accord with the manufacturer's written recommendations.

1.10 FIELD CONDITIONS

- A. Make and be responsible for field dimensions necessary for proper fitting and completion of Work. Report discrepancies to Architect before proceeding.
- B. Verify wall depths are adequate for each item prior to ordering. Notify Architect of conflicts or discrepancies.

1.11 WARRANTY

- A. Manufacturer: In addition to the Contractor's and Subcontractor's Guarantee, furnish Owner with manufacturer's fully executed written warranty for toilet accessories against defects in materials and workmanship, agreeing to replace and install toilet accessories at no additional cost to the Owner, within warranty period as follows:
 - 1. For a period of 3 years.

PART 2 - PRODUCTS

2.1 OWNER FURNISHED CONTRACTOR INSTALLED PRODUCTS

- A. The following products will be furnished by the Owner for installation by Contractor. Provide adequate blocking for attachment. Miscellaneous items are to be provided and installed by Contractor.

1. Toilet Tissue Dispensers.

2.2 DESIGN AND PERFORMANCE CRITERIA

- A. Conform to applicable requirements of ADA and CBC for accessibility. When in conflict, conform to the most stringent.

2.3 MANUFACTURERS

- A. Accessories: Bobrick Washroom Equipment Inc. or Bradley Corporation as specified and the basis of design, unless otherwise noted, or equal.
 1. Manufactured accessories not specified shall require approval as a substitution to be considered equal. Refer to substitution requirements specified in Section 01 3300, Submittal Procedures.
 2. Although multiple manufacturers may be specified for a specific accessory, all accessories shall be the product of a single manufacturer, unless otherwise specified or approved.

2.4 MANUFACTURED UNITS

- A. Grab Bars: 18 gauge 1-1/2 inch outside diameter, type 304 stainless steel welded to 1/8 inch type 304 solid stainless steel wall plates; Bobrick Series B-6806, Bradley 812 Series, or equal.
 1. Configurations and Lengths: As shown.
 2. Grab bar shall withstand a 250 pound point load.
 3. Joints ground and polished.
 4. Finish on Exposed Surfaces: Satin.
 5. Fastening: Concealed, vandal resistant.

2.5 FASTENINGS

- A. Toilet accessories shall be complete with required fastenings.
- B. Fastenings shall either harmonize with the item being fastened, or be of the concealed type.
- C. Exposed fastenings shall be theft and vandal-resistant.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Prior to installation of the Work of this Section, carefully inspect and verify that the installed Work of other trades is complete to the point where this installation may properly commence.
- B. Verify that specified items may be installed in accordance with the approved design.

TOILET ACCESSORIES
SECTION 10 2813
3595001

- C. In the event of discrepancy, immediately notify the Architect. Do not proceed in discrepant areas until discrepancies have been fully resolved.

3.2 PREPARATION

- A. The Contractor shall provide recesses, anchorage and back-up blocking in sizes and in locations as required for proper installation of accessories. Coordinate with other trades where necessary to make provisions for installation.
- B. Securely anchor items in place in locations and at mounting heights indicated. Where specific dimensions are not noted, installation shall be approved by the Architect.
- C. Securely fasten grab bar mounting plates to solid framing or blocking, in accordance with CBC.
- D. Provide cut-outs in toilet partitions for napkin disposal units as required.

3.3 INSTALLATION

- A. Install fixtures, accessories and items in accordance with manufacturers' printed instructions and requirements in the 2022 CBC 11B-603.5 where shown or as approved by Architect.
- B. Mount surface-mounted accessories to solid backing or blocking.
- C. Install plumb and level, securely and rigidly anchored to substrate.
- D. Use concealed vandal-resistant fastenings wherever possible.
 - 1. Adhesive installation not permitted.
 - 2. Provide anchors, bolts and other necessary fasteners, and attach accessories securely to walls or toilet partitions as recommended by manufacturer for each item and each type of substrate condition.
- E. Grab bars: Solidly anchor grab bars to withstand minimum downward pull of 500 pounds between any 2 supports after installation.
- F. Verify type, location and attachment methods of items furnished by Owner to ensure proper preparation of substrate for solid attachment of accessories.
- G. Sealants: Comply with requirements of Section 07 9200, Joint Sealants.
 - 1. Apply behind toilet accessories as necessary to ensure sanitary and watertight integrity of surfaces.
 - 2. Conceal sealants.

3.4 CLEANING AND ADJUSTING

- A. Upon completion of installation, remove manufacturer's temporary labels, marks of identification.
- B. Thoroughly wash surfaces, remove foreign materials, polish surfaces.

TOILET ACCESSORIES
SECTION 10 2813
3595001

- C. Leave entire accessories in neat, orderly, clean, acceptable condition as approved.
- D. Replace damaged parts, surfaces which are not free from imperfections.

3.5 PROTECTION

- A. Protect Work and materials of this Section prior to and during installation, and protect the installed Work and materials of other trades.
- B. In the event of damage, make repairs and replacements necessary to the approval of the Architect at no additional cost to the Owner.
- C. Exposed finish shall be free from scratches, dents, permanent discolorations and other defects in workmanship or material.

END OF SECTION

p:\sacramento\3595 tracy unified school district\001-000_villalovoz es new shade structures\08 specifications\06 spec\04 final\poet christian\10 2813_toilet accessories.docx
Last Updated: April 1, 2021

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Fire extinguishers, hangers and cabinets.
 - 2. Fire hose and extinguisher cabinet.

1.2 RELATED REQUIREMENTS

- A. Section 09 9100, Painting.

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CAL Green), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Submittal Procedures:
 - 1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
 - 2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.

1.5 ACTION SUBMITTALS

- A. Shop Drawings: Submit showing all parts, connections and anchorages, adjacent materials, fully dimensioned and noted. Include in-wall blocking requirements.
- B. Product Data: Submit list and complete descriptive data of all products proposed for use. Include manufacturer's specifications and installation instructions.

1.6 INFORMATIONAL SUBMITTALS

- A. Statement that all extinguishers and cabinets comply with the current applicable UL and NFPA classifications and ratings.
- B. Sample of manufacturer's warranty.

1.7 CLOSEOUT SUBMITTALS

- A. Written instructions to Owner's personnel in the operation, maintenance and charging of the fire extinguishers furnished.

FIRE EXTINGUISHERS AND CABINETS
SECTION 10 4416
3595001

- B. Warranty/Guarantee: Submit executed warranty and subcontractor's guarantee.

1.8 QUALITY ASSURANCE

- A. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.
- B. Single-Source Responsibility: Use materials and products of one manufacturer.
- C. Materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.
- D. Equipment shall be approved by Underwriters' Laboratories, Inc., bear UL Label and be approved by the State Fire Marshal.

1.9 DELIVERY, STORAGE AND HANDLING

- A. Deliver undamaged products to job in manufacturer's sealed containers and/or original bundles with tags and labels intact.
- B. Store materials in protected, dry conditions off of ground and in areas so as to not interfere with the progress of the work.
- C. Transport, store and handle in strict accord with the manufacturer's written recommendations.

1.10 FIELD MEASUREMENTS

- A. Make and be responsible for all field dimensions necessary for proper fitting and completion of work. Report discrepancies to Architect before proceeding.

1.11 WARRANTY

- A. Manufacturer: In addition to the Contractor's and Subcontractor's Standard Guarantee, furnish Owner with manufacturer's fully executed written warranty for fire extinguishers against defects in materials and workmanship for a period of not less than 5 years.

PART 2 - PRODUCTS

2.1 DESIGN AND PERFORMANCE CRITERIA

- A. Conform to all applicable standards of the National Fire Protection Association (NFPA) and California State Fire Marshal (CSFM) for fire extinguisher cabinets and locations.

2.2 FIRE EXTINGUISHERS

- A. Manufacturer: By same manufacturer as fire extinguisher cabinets.
- B. Types:

FIRE EXTINGUISHERS AND CABINETS
SECTION 10 4416
3595001

1. Fire extinguishers - General Use: UL Rating 3A-40BC extinguishers shall be 5-pound nominal capacity multi-purpose dry chemical type, bearing U.L. Label; finish shall be red enameled steel.
- C. Tamperseals on each extinguisher shall be of the breakable metal type, indicating accidental or unauthorized partial discharge.
- D. Pressure gauges on each extinguisher shall be of the dial type.
- E. Mounting Brackets:
 1. Manufacturer: Provide brackets from same manufacturer as fire extinguisher.
 2. Brackets shall be of quick release design, not subject to release by bumping.
 3. Bracket attachments shall be furnished with each bracket, suitable for the surface to which attachment is to be made.

2.3 FIRE EXTINGUISHER CABINETS

- A. General:
 1. Size cabinets to conform to size and number of extinguishers at each location shown on the Drawings.
- B. Manufacturer and Product: "Cosmopolitan" Series by JL Industries, Inc., a division of the Activar Construction Products Group as specified, or equal.
 1. Mounting:
 - a. Type 1: Semi-recessed with 2-1/2 inch return trim, rolled edge, for 3A-40BC fire extinguisher.
 - b. Type 3: Fully-recessed with 3/8 inch flat trim, depth as required.
 2. Door Style: S21 solid with black ABS flush (recessed) pull and continuous hinge.
 3. Latching Device: Manufacturer's standard roller catch.
 4. Finishes:
 - a. Door and Trim: Stainless steel, #4 satin finish.
 - b. Cabinet Box (Tub): Manufacturer's standard white electrostatic powder coat.
 5. Provide mounting clips, suitable for extinguishers being provided, in each cabinet.
 6. Identification: "FIRE EXTINGUISHER" in vertical red color lettering.
 7. Cabinet shall be fabricated to meet ADA and CBC projection criteria.
 8. Welded anchors to be provided appropriate to construction in which cabinet is placed.
 9. Cabinets located in fire rated walls to be "Cosmopolitan Fire FX" Option.

FIRE EXTINGUISHERS AND CABINETS
SECTION 10 4416
3595001

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Prior to installation of work of this Section, carefully inspect and verify that the installed work of all other trades is complete to the point where this installation may properly commence.
- B. Verify that specified items may be installed in accordance with the approved design.
- C. In the event of discrepancy, immediately notify Architect. Do not proceed in discrepant areas until discrepancies have been fully resolved.

3.2 PROTECTION

- A. Protect work and materials of this Section and other Sections prior to and during installation, and protect the installed work and materials of other trades.
- B. In the event of damage, immediately make all repairs and replacements necessary to the approval of the Architect and at no additional cost to the Owner.

3.3 INSTALLATION

- A. Install cabinets and extinguishers where indicated on the Drawings and as required by the local Fire Authority. Where exact location of cabinets is not indicated, locate as directed by Architect.
- B. Install cabinets in accordance with manufacturer's instructions and approved shop drawings.
- C. Install so that handle of extinguisher meets accessibility requirements.
- D. Prepare recesses in walls for cabinets as required by type and size of cabinet and style of trim and to comply with manufacturer's instructions. Provide blocking, backing and other materials necessary for proper attachment and fire rating.
- E. Anchor cabinets and brackets securely in place.
- F. Provide fire extinguisher in each fire extinguisher cabinet.

3.4 INSTALLATION OF FIRE EXTINGUISHERS

- A. Determine approximate completion date of work and then inspect, charge, and tag fire extinguishers not more than 10 calendar days before nor less than one day before actual completion of work.
- B. The installation of the specified fire extinguishers in no way relieves the Contractor from providing adequate fire protection during the course of this work.

FIRE EXTINGUISHERS AND CABINETS
SECTION 10 4416
3595001

END OF SECTION

*p:\sacramento\3595 tracy unified school district\001-000_villalovoz es new shade structures\08 specifications\06 spec\04 final\poet
christian\10 4416_fire extinguishers and cabinets.docx*
Last Updated: September 24, 2021

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Manual-operated horizontal louver blinds.

1.2 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CAL Green), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- C. National Fire Protection Association (NFPA):
 - 1. 701: Standard Methods of Fire Tests for Flame Propagation of Textiles and Films.
- D. California Administrative Code:
 - 1. Title 19: Public Safety.

1.3 ADMINISTRATIVE REQUIREMENTS

- A. Submittal Procedures:
 - 1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
 - 2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Contract Closeout and Final Cleaning.

1.4 ACTION SUBMITTALS

- A. Shop Drawings: Submit showing parts, connections and anchorages, adjacent materials, fully dimensioned and noted.
- B. Product Data: Submit list and complete descriptive data of products proposed for use. Include Manufacturer's specifications, published warranty or guarantee, installation instructions, and maintenance instructions.
- C. Samples: The following samples are required.
 - 1. Manufacturer's full range of colors for Architect's selection.

1.5 INFORMATIONAL SUBMITTALS

- A. Sample of manufacturer's warranty.

HORIZONTAL LOUVER BLINDS
SECTION 12 2113
3595001

1.6 CLOSEOUT SUBMITTALS

- A. Warranty/Guarantee: Submit executed warranty and Subcontractor's guarantee.

1.7 QUALITY ASSURANCE

- A. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.
- B. Use materials and products of one Manufacturer whenever possible.
- C. Materials, components, assemblies, workmanship and installation are to be observed by the Owner's Inspector of Record. Work not so inspected is subject to uncovering and replacement.
- D. Flame-resistant materials shall pass or exceed one of more of the following:
 - 1. National Fire Protection Association (NFPA) 701.
 - 2. California Administrative Code Title 19.

1.8 DELIVERY, STORAGE AND HANDLING

- A. Deliver undamaged products to job in Manufacturer's sealed containers and/or original bundles with tags and labels intact.
- B. Store materials in protected, dry conditions off of ground and in areas so as to not interfere with the progress of the Work.
- C. Transport, store and handle in strict accord with the manufacturer's written recommendations.

1.9 FIELD CONDITIONS

- A. Verify field measurements for openings to receive vertical blinds allowing proper clearances as recommended by Manufacturer to allow free rotation and traversing.
- B. Prior to shade installation, building shall be enclosed.
- C. Interior temperature shall be maintained between 60 degrees F and 90 degrees F during and after installation; relative humidity shall not exceed 80 percent. Wet work shall be complete and dry.

1.10 WARRANTY

- A. Manufacturer: In addition to the Contractor's and Subcontractor's Guarantee, furnish Owner with manufacturer's fully executed written limited lifetime warranty for the repair or replacement of horizontal louver blinds against defects in materials and workmanship.

PART 2 - PRODUCTS

2.1 PRODUCTS

- A. Model "CD80 1 Mini Aluminum Blind" as manufactured by Hunter Douglas Contract, or equal.

2.2 MATERIALS

- A. Slats: Aluminum alloy, 1 inch wide by .008 inch thick, heat-treated and spring tempered aluminum alloy 6011, with eased corners and manufacturing burrs removed. Furnish not less than nominal 15.2 slats per foot to ensure tight closure and light control.
- B. Slat Support: Braided ladders of 100 percent polyester yarn color compatible with slats and spacing of ladder no more than 20mm, reinforced to withstand 100 pound pull. Distance between ladders not to exceed Manufacturer's requirements.
- C. Headrail: U-shaped profile with rolled edges, measuring 1-3/8 inches x 1-3/8 inches x 0.024 inch constructed of corrosion-resistant steel, providing a beveled edge valance-free design. Ends to be fitted with 0.024 inch steel end lock with adjustable tab for centering blinds. Finish to be standard baked-on polyester and to match slats.
- D. Bottom Rail: Steel with corrosion-resistant finish formed with double-lock seam into closed oval shape for optimum beam and torsional strength. Ends fitted with color-coordinated engineered polymer caps. Finish to be standard baked-on polyester and to match slats.
- E. Lifting Mechanism: Crashproof steel cordlocks with corrosion-resistant finish, two-ply polyester cord filler in braided polyester jacket lift cords, cord equalizers, cordlock adapter, and cord stop / single pull cord. Install within 2022 CBC reach ranges 11B-308.
- F. Tilting Mechanism: Permanently lubricated die-cast worm and gear type tilter gear mechanism in fully enclosed housing with clutch action to protect ladder tapes from over rotation of the solid steel, corrosion resistant tilt rod.
- G. Tilt Control Wand: Tubular shaped 7/16 inch diameter extruded clear plastic, ribbed for positive grip and detachable without tools.
- H. Mounting Hardware: Manufacturer's standard as required for the type of installation shown.
- I. Hold-Down Brackets: Provide metal hold down brackets where blinds are to be mounted on doors.

2.3 FINISHES

- A. Aluminum: Manufacturer's standard baked-on finish in colors selected by Architect from manufacturer's available contract colors utilizing "Dust Shield" finish to inhibit dust build-up for easier maintenance.
- B. Cord and braided ladders shall be color coordinated with slat.

HORIZONTAL LOUVER BLINDS
SECTION 12 2113
3595001

2.4 FABRICATION

- A. Blind measurements shall be accurate to within plus or minus 1/8 inch or as recommended in writing by the manufacturer for the specific installation conditions.
- B. Hardware shall be enclosed in a metal head. Operating hardware shall be machine clinched to head to assure perfect alignment. Slats shall tilt to any angle by turning a transparent wand. Blinds shall fit within the window openings as detailed, unless otherwise indicated.
- C. Other materials and components not specifically described, but required for a complete and proper installation of horizontal window blinds, shall be selected by the Installer, subject to approval of the Architect. Do not intermix component parts of various manufacturers in assembled units.
- D. Prior to fabrication, verify cords and tilt devices will be accessible and operational from the floor and will not conflict with cabinets, doors, fixtures or other items. Locate on either end as directed or approved. Bring potential conflicts to Architect's attention for resolution prior to start of Work.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Prior to installation, carefully inspect and verify that the installed Work of other trades is complete to the point where this installation may properly commence.
- B. Verify that specified items may be installed in accordance with approved design.
- C. In the event of discrepancy, immediately notify the Architect. Do not proceed in discrepant areas until discrepancies have been fully resolved.

3.2 INSTALLATION

- A. Install horizontal window blinds level and true, in accordance with the Drawings and the manufacturer's recommended procedures.
- B. Blinds shall be installed inside mount, unless otherwise indicated. Consult with Architect where inside mount may not be possible.
- C. Provide 1-1/2 inch overlap at each jamb where face installations are indicated or approved.
- D. Divisions between blinds, where required, shall occur only at mullions.
- E. Install intermediate support brackets and extension brackets as needed to prevent deflection in headrail.

3.3 CLEANING AND ADJUSTING

- A. Test operation of horizontal window blind hardware before and after installation. Operation shall be smooth and uniform.
- B. Upon completion of installation, remove manufacturer's temporary labels, marks of identification. Thoroughly wash surfaces and remove foreign material. Leave entire Work in neat, orderly, clean and acceptable condition as approved. Replace damaged parts and surfaces which are not free from imperfections.
- C. Finish installation free of dirt and finger marks. Leave work area clean and free of debris.

3.4 PROTECTION

- A. Protect Work and materials of this Section prior to and during installation, and protect the installed Work and materials of other trades.
- B. In the event of damage, make repairs and replacements necessary to the approval of the Architect at no additional cost to the Owner.
- C. Exposed finishes shall be free from scratches, dents, permanent discolorations and other defects in workmanship or material.

END OF SECTION

p:\sacramento\3595 tracy unified school district\001-000_villalovo es new shade structures\08 specifications\06 spec\04 final\poet christian\12 2113_horizontal louver blinds.docx
Last Updated: April 2, 2021

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Manufactured, plastic-laminate-faced, modular casework and accessory items.

1.2 RELATED REQUIREMENTS

- A. Section 01 6116, Volatile Organic Compound (VOC) Content Restrictions, for VOC limits pertaining to adhesives, sealants, fillers, primers, and coatings.
- B. Section 01 8113, Sustainable Design Requirements, for CAL-Green general
- C. Section 06 4023, Interior Architectural Woodwork.
- D. Section 09 2900, Gypsum Board.
- E. Section 09 9100, Painting.
- F. Section 12 3623, Plastic-Laminate-Clad Countertops.
- G. Division 26, Electrical, for electrical outlets and fittings built into architectural casework.

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as note on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CALGreen), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- C. American National Standards Institute (ANSI):
 - 1. ANSI A208.2: Medium Density Fiberboard for Interior Use.
 - 2. ANSI/BHMA A156.9: American National Standard for Cabinet Hardware; Builders Hardware Manufacturers Association.
 - 3. ANSI/BHMA A156.18: American National Standard for Materials and Finishes; Builders Hardware Manufacturers Association.
- D. National Electrical Manufacturers Association (NEMA):
 - 1. NEMA LD3.1: "High-Pressure Decorative Laminates."
- E. Woodwork Institute (WI)/ Architectural Woodwork Manufacturers of Canada (AWMAC):
 - 1. North American Architectural Woodwork Standards (NAAWS).

MANUFACTURED PLASTIC-LAMINATE-CLAD CASEWORK
SECTION 12 3216
3595001

1.4 DEFINITIONS

- A. General: The following definitions are in conformance with those included in the referenced NAAWS document.
- B. "Exposed Exterior" surfaces include all surfaces visible when doors and drawers are closed.
 - 1. Bottoms of casework more than 4 feet above the floor will be considered an exposed surface.
 - 2. Tops of casework that are visible by building occupants from stairs, mezzanines or other elevated locations will be considered as exposed.
- C. "Exposed Interior Surfaces" surfaces exposed to view in open casework or behind glass doors.
- D. "Semi-Exposed Surfaces" are interior surfaces only exposed to view when doors or drawers are open.
- E. "Concealed Surfaces" include surfaces of sleepers, web frames, dust panels, and other surfaces that are not visible after installation.

1.5 ADMINISTRATIVE REQUIREMENTS

- A. Submittal Procedures:
 - 1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
 - 2. Sustainable Design Submittals shall comply with the additional requirement of Section 01 8113, Sustainable Design Requirements.
 - 3. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
- B. Scheduling and Coordination:
 - 1. Require casework fabricator to examine the schedule and check it for timing, accuracy and compatibility with its work and shall coordinate work with the master schedule and job superintendent.
 - 2. Require casework fabricator to furnish assistance in coordination and scheduling of other work pertinent to casework installation and to notify Contractor of requirements so as to result in a well-coordinated job.

1.6 ACTION SUBMITTALS

- A. Shop Drawings:
 - 1. Submit dimensioned plans, elevations, component profiles, and details for each casework layout showing the following:
 - a. Locations and type of service fixtures with lines thereto; anchorage locations, installation details to floors and walls.

MANUFACTURED PLASTIC-LAMINATE-CLAD CASEWORK
SECTION 12 3216
3595001

- b. Relationship of units in to surrounding and adjacent construction including walls, doors, and windows.
 - c. Swing of doors.
 - d. Shelving.
 - e. Accessory items such as fillers, end panels, and valance.
 - f. Base height.
 - 2. First page of shop drawings and each elevation shall bear an individually serial-numbered WI "Certified Compliance Label."
- B. Product Data:
- 1. Provide manufacturers cut sheets for all materials proposed for use including:
 - a. Panel products.
 - b. Cabinet hardware items.
 - c. Laminates.
 - 2. Include manufacturer's literature for items which are proposed for use and specified herein only by listing the intended performance requirements.
- C. Samples: The following samples are required.
- 1. Each type of high pressure laminate (HPL), edge banding, cabinet liner, and melamine-faced panel.
 - a. Plastic laminate and edge banding to be selected from manufacturers' full range of colors by Architect.
 - 2. Hardware: Adjustable shelf clip, hinge, pull, magnetic catch, elbow catch and lockset. Returned hardware samples may be used on the project unless otherwise noted by the Architect.

1.7 INFORMATIONAL SUBMITTALS

- A. Before delivery of casework to jobsite, submit a WI "Certified Compliance Certificate" listing the items certified, the applicable NAAWS Grade, and whether installation is included.
- B. Qualification Data: For installer.
- C. Sample of manufacturers' warranty.
- D. Sustainable Design:
 - 1. General:
 - a. Submit information necessary to establish and document compliance with the California Green Building Standards Code.
 - b. Sustainable design submittals are in addition to other submittals.
 - 2. The following information shall be provided:
 - a. Composite Wood: Evidence of compliance that products meet formaldehyde limits of current CARB Airborne Toxic Control Measure (ATCM) as specified in Section 01 6116.

MANUFACTURED PLASTIC-LAMINATE-CLAD CASEWORK
SECTION 12 3216
3595001

- b. Adhesives and Sealants: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.

1.8 CLOSEOUT SUBMITTALS

- A. Warranty: Submit executed warranty.
- B. **[Specified maintenance materials]**

1.9 MAINTENANCE MATERIAL SUBMITTALS

- A. Provide additional materials as follows:
 - 1. Hinges: 10 each.
 - 2. Pulls: 10 each.
 - 3. Cabinet Locks: 10 each.
 - 4. Adjustable Shelf Supports: 25 each.
- B. Deliver to Owner as directed.

1.10 QUALITY ASSURANCE

- A. General:
 - 1. Furnish all components and accessories and all allied products new and free from defects.
 - 2. To assure proper coordination and eliminate divided responsibility, all work specified in this Section shall be executed under the direction of a single manufacturer and supplier.
- B. Qualifications:
 - 1. Manufacturer: The casework manufacturer must have not less than 5 years of production experience similar to this project, and the specified product, and whose qualifications indicate the ability to comply with the requirements of this section.
 - 2. Installer: The installer must have at least one project in the past 5 years with similar systems and complexities to those required for this project, and where the value of the woodwork is a minimum of 80% of the cost of woodwork for this project.
- C. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.
- D. Single-Source Responsibility: Use materials and products of one manufacturer whenever possible.
- E. Materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.
- F. Casework Designations:

MANUFACTURED PLASTIC-LAMINATE-CLAD CASEWORK
SECTION 12 3216
3595001

1. Reference numbers on Drawings are related to NAAWS Cabinet Design Series (CDS) Elevation numbers, and are used to identify prefinished casework and to indicate dimensions, general design, equipment, shelving (adjustable and fixed) and other components to be furnished. Unless modified by notation on Drawings, description for indicated number shall constitute requirements for such cabinets incorporating all features set forth in the NAAWS CDS Elevations.
 2. Use of the NAAWS CDS Elevations numbers, and specific requirements set forth on the Drawings and as specified, are not intended to preclude use of other manufacturer's product or procedure, which may be equal thereto, but are given to establish standard of design and quality of materials, construction and workmanship.
- G. Proof of compliance with the specified NAAWS Grade assembly and installation shall be provided by the following WI Quality Control Program:
1. WI Monitored Compliance Program.
 - a. All casework and the installation thereof for this project shall be directly monitored for compliance to the Contract by the Woodwork Institute under the scope of their Monitored Compliance Program (MCP).
 - 1) Inspections are to be performed at the beginning of fabrication, at the time of delivery to the job, at the beginning of installation, at completion of installation.
 - 2) Further information on the WI Monitored Compliance Program's Policies and Procedures are available directly from the Woodwork Institute, 916-372-9943.
 - 3) The WI MCP Registration Number shall be referenced in all communication.
 - b. Fees charged by the Woodwork Institute for their monitored compliance service are the responsibility of the Contractor and shall be included in the Contract sum.
 - c. Casework and/or installation determined to be non-compliant by WI and not corrected will be rejected.
 - d. Issuance of the WI Monitored Compliance Certificate is a prerequisite of the Owner's final acceptance.
- H. Mockups: Provide mockup of one base cabinet and one wall hung cabinet to verify finish material selections, modifications made under sample submittals, and to demonstrate aesthetic effects and set quality standards for materials and execution for cabinet exteriors, interior construction, and hardware.
1. The base cabinet is to have at least one drawer and be of the same material to be provided for the project.
 2. The approved mockup may be incorporated in the project.
- 1.11 DELIVERY, STORAGE AND HANDLING**
- A. Deliver undamaged products to job in manufacturer's sealed containers and/or original bundles with tags and labels intact.

MANUFACTURED PLASTIC-LAMINATE-CLAD CASEWORK

SECTION 12 3216

3595001

- B. Store materials in protected, dry conditions off of ground and in areas so as to not interfere with the progress of the work.
- C. Transport, store and handle in strict accordance with the manufacturer's recommendations.
- D. Do not deliver until wet operations in building are completed and storage area is closed in and broom clean, with relative humidity 50 percent or less at 70 degrees F.
- E. Deliver in sections to fit through openings.

1.12 FIELD CONDITIONS

- A. Environmental Limitations: Do not deliver or install casework until building is enclosed, wet-work is complete, and HVAC system is operating and maintaining temperature and relative humidity at levels planned for building occupants during the remainder of the construction period.
- B. Products shall be available at project when required for installation so as not to delay job progress. Installer for these products shall cooperate with installers performing work under other sections involved to effect proper installation.
- C. Casework fabricator shall coordinate installation of any Owner supplied equipment where indicated on the Drawings.
- D. Field Measurements: Make and be responsible for all field dimensions necessary for proper fitting and completion of work. Report discrepancies to Architect before proceeding.

1.13 WARRANTY

- A. Manufacturer: In addition to the Contractor's Standard Guarantee, furnish Owner with manufacturer's fully executed written 5-year warranty for casework against defects in materials and workmanship. Warranty shall include against delaminations, joint separations, warp or twist in doors more than 1/4 inch, and splits or cracks in finished surfaces.

PART 2 - PRODUCTS

2.1 DESIGN AND PERFORMANCE CRITERIA

- A. Sustainable Design:
 - 1. Composite wood products must meet current formaldehyde emission limits of CARB Airborne Toxic Control Measure (ATCM) as specified in Section 01 6116.
 - 2. VOC emissions for field-applied adhesives, sealants, and sealant primers must comply with limits specified in Section 01 6116.

2.2 PANEL MATERIALS

- A. Medium-Density Fiberboard (MDF): ANSI A208.2, Grade 155, formaldehyde-free, and meeting grade MR30 moisture resistance; "Medite II," by Roseburg, or equal.
 - 1. Thickness: 3/4 inch, unless otherwise shown or specified.
- B. Thermally-Fused Melamine Panels (TFM): Melamine resin-impregnated decorative paper thermally fused to a formaldehyde free MDF core.
 - 1. Color: White, unless otherwise noted or selected by Architect from a minimum of 6 colors.
- C. Plywood: Exterior type, Grade B-C or better. Plywood to be free of urea-formaldehyde.
- D. Hardboard: Tempered Grade, conforming to standards of American Hardboard Association or PS-50; use smooth side exposed.
- E. Particle Board: Not permitted.

2.3 LAMINATE MATERIALS

- A. High-Pressure Plastic Laminate: Conforming to NEMA LD3.1 and ISO 4586-2.
 - 1. Grades:
 - a. Horizontal Surfaces: ISO 10/HGS; horizontal, general purpose, standard.
 - b. Vertical Surfaces: ISO 20/VG; vertical, general purpose.
 - c. Cabinet Liner (If Specified TFM Panel is Not Used): ISO 72/CLS, cabinet liner, standard.
 - d. Backing Sheet: ISO 91/BKL; backer, light duty.
 - 2. Manufacturers: Formica, Wilsonart, Arborite, Pionite, Nevamar, or equal.
 - 3. Colors, and Patterns:
 - a. Exposed: As selected by Architect from manufacturer/suppliers' full product color range.
 - 1) There will be no additional cost allowance for premium color selections, or for selection of different colors for different rooms up to a maximum 6 colors.
 - 2) Doors and frames may be different selections.
 - b. Cabinet Liner: White.

2.4 ADDITIONAL MATERIALS

- A. Edge Bandings:
 - 1. 3-mm thick PVC: Solid, high impact, purified, color-thru, acid resistant, pre-laminated primed edging, machine-applied with hot melt adhesives, automatically trimmed, inside/outside length-radiused for uniform appearance, buffed and corner-radiused for consistent design.
 - a. Locations: Door and drawer face edge, and exposed shelf edge.

MANUFACTURED PLASTIC-LAMINATE-CLAD CASEWORK
SECTION 12 3216
3595001

- b. Color: As selected by Architect from manufacturer's full range of standard colors.
- 2. 0.02-inch thick PVC: Flat Edge, solid, high impact, purified, color-thru, acid resistant PVC, edging machine-applied with hot melt adhesives, automatically trimmed face, back and corners for uniform appearance.
 - a. Locations:
 - 1) Drawer body edge, not drawer face, and cabinet body edge including door and drawer front spacer rail.
 - 2) Interior body component edging, interior dividers and interior shelving.
 - b. Color: Match cabinet interior surface color.

2.5 HARDWARE

- A. Comply with requirements of BHMA A156.9, Type 2 (Institutional).
- B. Finishes:
 - 1. Exposed Items: Satin chromium plated, 626, unless otherwise noted complying with ANSI/BHMA A156.18.
 - 2. Concealed Items: Manufacturer's standard finish, complying with applicable product class of ANSI/BHMA A156.9.
- C. Hinges:
 - 1. Type: Heavy duty, five knuckle, 2-3/4-inch, institutional type hinge; let into door to achieve 1/8 inch reveals; Part Number 374 by Rockford Process Control, or equal, unless otherwise recommended by fabricator for total door and side panel thickness after application of laminate finish.
 - a. Hinges shall be mill ground, hospital tip, tight pin feature with all edges eased.
 - b. Hinges to be full wrap around type of tempered steel 0.095 inch thick.
 - c. Hinges shall accommodate 3/4 inch thick laminated door and allow 270 degree swing.
 - 2. Fasteners: Each hinge to have minimum 9 screws, #7, 5/8 inch FHMS to assure positive door attachment. Fill all holes if greater than 9.
 - 3. Quantity:
 - a. One pair per door to 48 inches in height.
 - b. One and one-half pair 48 inches in height to 84 inches in height.
 - c. Over 84 inches in height, provide 2 pair of hinges.
- D. Door and Drawer Pulls: Hafele, Catalog No. 110.08.400, or equal.
- E. Magnetic Catches: Häfele 246 with matching strike plate, matt nickel finish, or equal.
- F. Locks: CompX National Lock C8100 Series pin tumbler, or equal.
 - 1. All cabinets in each Room to be keyed alike.
 - 2. All Rooms to be keyed different.

MANUFACTURED PLASTIC-LAMINATE-CLAD CASEWORK
SECTION 12 3216
3595001

- 3. Locations: As indicated on the Drawings.
- G. Locks: Schlage CL2000 Series cabinet and drawer locks with solid brass 6 pin cylinders.
 - 1. Locks in rooms keyed alike; rooms keyed differently.
- H. Surface Bolt for Locked Pair Doors: Elbow Catch: #2 Elbow Catch by Ives, or equal.
 - 1. Finish: Satin chrome.
 - 2. Locate and mount surface bolt on door far enough below shelf to allow for 1/2-inch deflection of shelf and also to allow for proper engagement of surface bolt and angle strike.
- I. Drawer Guides: Accuride as specified, or equal:
 - 1. Drawers Less Than 24 inches Wide: Light duty, full extension; Model 3732.
 - a. Provide appropriate length.
 - b. Load Rating per Pair: 100-pounds.
 - 2. Drawers 24 inches to 36 Inches Wide: Medium duty with 1-inch over travel; Model 3301.
 - a. Provide appropriate length.
 - b. Load Rating per Pair: 150-pounds.
 - 3. Drawers 36-inches to 42-inches Wide: Heavy-duty with 1-inch over travel; Model 3634.
 - a. Provide appropriate length.
 - b. Load Rating per Pair: 200-pounds.
 - 4. Drawers 42-inches to 48-inches Wide: Heavy duty with 1-inch over travel; Model SS5321.
 - a. Provide appropriate length.
 - b. Load Rating per Pair: 350-pounds.
- J. Adjustable Shelf Supports: Seismic restraining type; "Universal 1" by Hettich International for insertion into 5 mm holes, or equal.

2.6 ADDITIONAL MATERIALS

- A. Bumper Pads (Silencers): Hemispherical, quiet clear type, 55 Shore A hardness; 3M Bumpon Protective Products, or equal.
- B. Adhesive: As recommended by panel manufacturer best suited for the intended use and that has a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
- C. Glue: Aliphatic-resin, polyurethane, or resorcinol wood glue recommended by manufacturer for general carpentry use that has a VOC content of 30 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
- D. Fasteners: Size and type to suit application in accordance with specified standards and as required.

MANUFACTURED PLASTIC-LAMINATE-CLAD CASEWORK
SECTION 12 3216
3595001

2.7 FABRICATION - GENERAL

- A. Construction shall conform to NAAWS casework requirements.
- B. Make job measurements as required for proper fabrication of the work.
- C. Grade: Custom. If provisions for the NAAWS Grade are in conflict with, or modified by the drawings and/or specifications, the modifications shall govern.
- D. Door and Drawer Front Style: Flush overlay, NAAWS Style A.
- E. Carcass Construction: Type A frameless. Provide as single unit at open shelving to greatest extent possible.

2.8 FABRICATION OF CABINET COMPONENTS

- A. Cabinet Bodies:
 - 1. Fabricate, assemble and finish each cabinet as complete, self-supporting unit.
 - a. Unless otherwise shown, counter height and tall storage units shall be 24 inches minimum overall depth; wall-hung units shall be 15 inches minimum overall depth.
 - b. At concealed locations, provide tops on all wall-hung and tall cabinets utilizing melamine on both faces.
 - c. At locations where the tops of wall hung or tall cabinets are visible, provide tops on all wall-hung and tall cabinets utilizing HPL on exterior face and melamine on interior face.
 - d. Fabricate bottoms, tops and frames of lock-joint glued and screwed, or dowelled and glued construction to end panel construction. Simple butted not permitted.
 - e. Tops and sides of tall units and wall-hung cabinets shall be 3/4-inch thick MDF core.
 - f. Bottoms of upper cabinets shall be constructed of same materials as specified for shelving.
 - g. Tall cabinets and base cabinets, fronts and sides shall be 3/4-inch thick MDF core.
 - h. Cabinet backs shall be a minimum of 1/4-inch thick.
 - i. Dowel and screw partitions and boxed shelves into top framing, bottoms or ends, as applicable.
 - j. Middle shelf of tall cabinets, 5 feet or greater in height, shall be fixed.
 - k. At top of counter height units, provide 3/4-inch plywood boxed subframe, mortised and tenonned, glued and screwed, for concealed attachment of countertop and for cabinet rigidity.
 - l. Provide toe space on floor-mounted units.
 - m. For tall units and wall-mounted cabinets, include 5/8 inch x 3 inch concealed wood strips full length at top and bottom, for screw or bolt anchorage to wall to conform to pull requirements of Title 24.
 - n. Holes for Shelf Support Clips: 32mm on center.

MANUFACTURED PLASTIC-LAMINATE-CLAD CASEWORK
SECTION 12 3216
3595001

- 1) Provide 2 holes on each side of shelf except provide a 3rd hole where cabinets are deeper than 24 inches.
 - 2) Locations shall be confirmed with Architect.
 - o. The fabrication of casework must allow for shim space at the base of the cabinets, to account for field conditions, as required so that the height from finish floor to top of counter, and sink rim where occurs, does not exceed the specified height at any location along the countertop after installation.
 - 2. Finishing:
 - a. Exposed Interior Surfaces and Semi-Exposed Surfaces:
 - 1) Melamine bonded to MDF core; specified TFM panel.
 - 2) Use for all semi-exposed surfaces, tops and bottoms of wall-hung and tall cabinets except as otherwise specified, concealed ends, partitions, and drawer boxes.
 - 3) See "Shelves" Paragraph for panel and finish requirements for shelving.
- B. Drawers:
- 1. Fabrication:
 - a. Fabricate and assemble drawer boxes with subfront and back glued and screwed into tenons at drawer sides.
 - b. Fronts shall be 3/4 inch thick MDF.
 - c. Sides: 1/2 inch thick MDF to create drawer box subfront, sides, back and bottom.
 - d. Extend bottom into dados with glue and screws at all 4 edges, using 1/4-inch materials matching the sides and backs.
 - e. At drawers over 30 inches wide, provide 1/2-inch bottoms.
 - f. Install 2-drawer guides for each drawer with positive closing and stop device to prevent inadvertent removal.
 - g. Drawer boxes to be full height of drawer opening.
 - h. Attach drawer front to subfront with #8 x 1-inch pan head wood screws (P.H.W.S.)
 - i. Provide closing stops at the rear of both drawer sides, unless stops are built into the slides to prevent the drawer front from impacting the cabinet body.
 - 2. Finishing:
 - a. Drawer Front: Vertical grade high-pressure laminate (HPL).
 - b. Interior Face of Drawer Front: Cabinet liner.
 - c. Band all 4 edges of drawer front with specified banding material.
 - d. Provide TFM panel with melamine finish on both faces, for subfront, sides, back and bottom.
- C. Doors:
- 1. Fabrication:
 - a. Panel: 3/4-inch thick MDF.

MANUFACTURED PLASTIC-LAMINATE-CLAD CASEWORK
SECTION 12 3216
3595001

- b. Hang face-mounted over cabinet, pairs parallel with proper clearance at pull edges. Install hardware.
 - c. Clearance Tolerances: Develop 1/8 inch maximum reveals.
 - 2. Finishing:
 - a. Exposed Exterior Face: Specified HPL.
 - 1) Where wood grain pattern is selected, provide pairs of doors with book-match wood grain patterns.
 - b. Exposed Interior Face: Cabinet liner.
 - c. Band all 4 edges of doors with specified banding material.
- D. Shelves:
 - 1. Fabrication - General:
 - a. Shelving to be adjustable on 1-1/4 inch centers supported by 4 adjustable shelf clips.
 - b. Loading capacity to be minimum 50 pounds per square foot, not to exceed 200 pounds on any shelf.
 - c. Shelving shall match the interior depth of the cabinet box.
 - d. Band all leading edges with edge banding material as specified.
 - 2. Shelving less than 24 inches: 3/4-inch MDF.
 - a. Finish: Melamine, both sides.
 - 3. Shelving 24 to 30 inches: 1-inch MDF.
 - a. Finish: Melamine, both sides.
 - 4. Shelving Greater than 30 inches, up to 36 inches: 1-inch, MDF.
 - a. Finish: Vertical grade HPL, both sides, applied with rigid glue line process.
 - 5. Shelving Greater than 36 inches, up to 48 inches: 1-inch plywood.
 - a. Finish: Vertical grade HPL, both sides, applied with rigid glue line process. Contact adhesive is not permitted.
- E. Scribes and Filler Panels:
 - 1. Provide matching scribes and filler panels, and scribe all cabinets to abutting walls, partitions and ceilings.
 - 2. Scribes shall not exceed 1-1/2 inches wide.
 - 3. Scribe to be covered top and bottom.
 - 4. At locations where casework wraps inside corners, provide top and bottom filler panels where voids occur.
- F. Cabinet Bases:
 - 1. If casework manufacturer chooses to use cabinet bases, they shall be 4 inches standard height.
 - 2. Fabricate completely out of 3/4-inch plywood in continuous lengths to insure straight and level installation of cabinet bodies. MDF is not acceptable for use at bases.

3. Freestanding cabinets shall have cabinet ends running directly to the floor.
4. Anchorage fasteners to be neatly installed through the back and anchor strip at the top and bottom, and middle at tall cabinets.

2.9 COORDINATION WITH APPLIANCES

- A. Contractor shall have casework manufacturer review all locations where appliances are to be installed and coordinate dimensions to ensure the correct size openings are provided.
 1. Shop drawings shall clearly indicate locations and opening dimensions.
 2. Where appliances are not in contract, shop drawings shall request confirmation of critical dimensions.
- B. Adjustments that need to be made to the casework due to appliances not fitting correctly are to be done at no additional cost to the Project.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Prior to installing casework, examine and verify that the installed work of all other trades is complete to the point where this work may properly commence.
- B. Verify that specified items may be installed in accordance with the approved design.
- C. Review in job conditions, installation requirements, and quality of completed substrate for compliance with Architect's expectations related to floor flatness for installation of casework.
- D. In the event of discrepancy, immediately notify the Architect. Do not proceed in discrepant areas until discrepancies have been fully resolved.

3.2 PREPARATION

- A. Take all necessary measurements in the field to ensure proper dimensions for cabinets prior to fabrication.
- B. Coordinate with other trades whose work adjoins, combines, or aligns with casework.
- C. Where substrate is not in compliance with Architect's expectations related to floor flatness for installation of casework, and where excessive shimming to meet these expectations would be required, level substrate using latex-modified, portland cement based or blended hydraulic-cement-based formulation as specified in Section 03 5416, Hydraulic Cement Underlayment.

3.3 INSTALLATION

- A. Install all work in conformance with the referenced NAAWS document.

MANUFACTURED PLASTIC-LAMINATE-CLAD CASEWORK
SECTION 12 3216
3595001

- B. Supervision: Installation work shall be under direct supervision of representative of manufacturer of the casework.
- C. Set work level, square and in true alignment. Cabinetwork shall fit to walls and upon completion of installation shall show no marks, indentations or other defects. Furnish scribes, filler panels, trim and molding required for finished installation. When set, each individual cabinet shall be capable of withstanding, without movement, a force of 200 pounds applied in any direction.
- D. Cabinet work shall be installed as required so that the height from finish floor to top of counter, and sink rim where occurs, does not exceed the specified height at any location along the countertop after installation.
- E. Method of attachment, including the type, size, frequency and/or spacing of anchoring devices and fasteners shall comply to NAAWS minimum requirements or be as indicated on the Drawings or as specified, whichever is more restrictive.
- F. Doors, drawers and fixtures shall operate correctly and smoothly.
- G. Furnish miscellaneous metal support and bracing required for installation. If necessary, deliver these items to other trades responsible for installation into adjacent work and designate exact location for their installation.
- H. Provide specified seismic restraining, adjustable shelf supports at all adjustable shelves to prevent shelf from sliding out of cabinets with or without doors.

3.4 ADJUSTING AND CLEANING

- A. Prior to final inspection and acceptance by the Architect, completely check each installed item and adjust for proper operation.
- B. Remove all fingerprints, smudges and the like from casework; vacuum clean drawers and interiors of dust, dirt and sawdust.

3.5 PROTECTION

- A. Protect work and materials of this Section prior to and during installation and protect the installed work and materials of other trades. Adjust all moving or operating parts to function smoothly and correctly.
- B. In the event of damage, make all repairs and replacements necessary to the approval of the Architect at no additional cost to the Owner.

END OF SECTION

p:\sacramento\3595 tracy unified school district\001-000_villalovoz es new shade structures\08 specifications\06 spec\04 final\poet christian\12 3216_manufactured plastic-laminate-clad casework.docx
Last Updated: November 1, 2021

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Plastic laminate faced counters and splashes.

1.2 RELATED REQUIREMENTS

- A. Section 01 6116, Volatile Organic Compound (VOC) Restrictions, for VOC limits pertaining to adhesives, sealants, fillers, primers, and coatings.
- B. Section 01 8113, Sustainable Design Requirements, for CAL-Green general requirements and procedures.
- C. Section 06 4023, Interior Architectural Woodwork.
- D. Section 07 9200, Joint Sealants.
- E. Section 12 3216, Manufactured Plastic-Laminate-Clad Casework; casework to receive countertops.
- F. Division 26, Electrical, for electrical outlets and fittings built into countertops.

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CAL Green), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- C. American National Standards Institute (ANSI):
 - 1. A161.2: Decorative Laminate Countertops, Performance Standards for Fabricated High Pressure.
 - 2. A208.1: Particleboard.
 - 3. A208.2: Medium Density Fiberboard (MDF) for Interior Applications.
- D. International Organization for Standardization (ISO):
 - 1. 4586-2: "High-pressure decorative laminates (HPL, HPDL) - Sheets based on thermosetting resins (usually called laminates) - Part 2: Determination of properties."
- E. Woodwork Institute (WI): North American Architectural Woodwork Standards (NAAWS) published jointly by WI and the Architectural Woodwork Manufacturers of Canada (AWMAC).

PLASTIC-LAMINATE-CLAD COUNTERTOPS
SECTION 12 3623
3595001

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Submittal Procedures:
 - 1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
 - 2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
 - 3. Sustainable Design Submittals shall comply with the additional requirement of Section 01 8113, Sustainable Design Requirements.

1.5 ACTION SUBMITTALS

- A. Shop Drawings: Prepare for each countertop in accordance with Section 1 Article entitled "Submittals" of the referenced NAAWS document.
 - 1. Show items interfacing with countertops including relationship to supporting casework.
 - 2. Identify materials to be used.
 - 3. Shop drawings for countertops may be submitted as part of shop drawings prepared and submitted under Section 12 3216, Manufactured Plastic-Laminate-Clad Casework.
- B. Samples: 8 by 10-inch piece of selected pattern and color of plastic laminate.

1.6 INFORMATIONAL SUBMITTALS

- A. Before delivery of countertops to jobsite, submit a WI "Certified Compliance Certificate" listing the items certified, the applicable NAAWS Grade, and whether installation is included.
- B. Sustainable Design:
 - 1. General:
 - a. Submit information necessary to establish and document compliance with the California Green Building Standards Code.
 - b. Sustainable design submittals are in addition to other submittals.
 - 2. The following information shall be provided:
 - a. Adhesives and Sealants: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.
 - b. Composite Wood: Evidence of compliance that products meet formaldehyde limits of current CARB Airborne Toxic Control Measure (ATCM) as specified in Section 01 6116.
- C. Qualification Data: For fabricator.

1.7 CLOSEOUT SUBMITTALS

- A. Guarantee: Submit extended Contractor guarantee.

1.8 MAINTENANCE MATERIAL SUBMITTALS

- A. Grommets: 5 of each Type.

1.9 QUALITY ASSURANCE

- A. Fabricator Qualifications: Active member of WI. Other fabricators will be considered for approval upon submission of at least 5 years of verifiable evidence of experience in successful completion of work similar to work of this Project. This provision does not waive compliance with specified WI certification.
- B. Standard for Materials and Workmanship:
 - 1. Comply with the applicable requirements of Section 11 - Countertops of the "North American Architectural Woodwork Standards (NAAWS)" published jointly by WI and AWMAC. (hereinafter referred to as "woodworking standard").
 - 2. Where Contract Documents indicate requirements that conflict with or augment the woodworking standard, comply with the conflicting or augmenting requirements.
- C. Materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.
- D. Proof of compliance with the specified NAAWS Grade assembly and installation shall be provided by the following WI Quality Control Program:
 - 1. WI Monitored Compliance Program.
 - a. All countertops and the installation thereof for this project shall be directly monitored for compliance to the Contract by the Woodwork Institute under the scope of their Monitored Compliance Program (MCP).
 - 1) Inspections are to be performed at the beginning of fabrication, at the time of delivery to the job, at the beginning of installation, at completion of installation.
 - 2) Further information on the WI Monitored Compliance Program's Policies and Procedures are available directly from the Woodwork Institute, 916-372-9943.
 - 3) The WI MCP Registration Number shall be referenced in all communication.
 - b. Fees charged by the Woodwork Institute for their monitored compliance service are the responsibility of the Contractor and shall be included in the Contract sum.
 - c. Countertops and/or installation determined to be non-compliant by WI and not corrected will be rejected.
 - d. Issuance of the WI Monitored Compliance Certificate is a prerequisite of the Owner's final acceptance.

PLASTIC-LAMINATE-CLAD COUNTERTOPS
SECTION 12 3623
3595001

1.10 DELIVERY, STORAGE, AND HANDLING

- A. Do not deliver products until wet work, painting, and similar operations in storage and installation areas that could damage or soil work have been completed.
- B. Protect products during transit, delivery, storage, and handling so as to prevent damage, soiling, and deterioration.
- C. Store countertops only in areas where ambient conditions required can be and are maintained.
- D. Coordinate delivery with fabrication and installation of casework.

1.11 FIELD CONDITIONS

- A. Products shall be available at project when required for installation so as not to delay job progress. Contractor shall have its installer for these products cooperate with installers performing work under other Sections involved to effect proper installation.
- B. Environmental Limitations: Do not deliver or install countertops until building is enclosed, wet-work is complete, and HVAC system is operating and maintaining temperature and relative humidity at levels planned for building occupants during the remainder of the construction period.
- C. Field Measurements: Where countertops are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication and indicate measurements on shop drawings.

1.12 GUARANTEE

- A. Contractor: In addition to its standard Guarantee under the Contract, furnish Owner a special extended written 5-year guarantee, cosigned by installer, agreeing to repair or replace plastic-laminate-clad countertops that fail to perform as required within guarantee period as a result of failure of materials or installation workmanship at no additional cost to the Owner.

PART 2 - PRODUCTS

2.1 DESIGN AND PERFORMANCE CRITERIA

- A. Sustainable Design:
 - 1. VOC emissions for field-applied adhesives, sealants, and sealant primers must comply with limits specified in Section 01 6116.
 - 2. Composite wood products must meet current formaldehyde emission limits of CARB Airborne Toxic Control Measure (ATCM) as specified in Section 01 6116.

2.2 PANEL MATERIALS

- A. Medium-Density Fiberboard (MDF): ANSI A208.2, Grade 155, formaldehyde free. 3/4 inch thick unless otherwise indicated.

1. Typical Locations: Meeting grade MR30 moisture resistance; "Medite II," by Roseburg, or equal.
 2. At Sinks and Adjoining Countertops on Same Wall: Meeting grade MR50 moisture resistance; "Medex," by Roseburg, or equal.
- B. Particleboard: Not permitted.

2.3 LAMINATE MATERIALS

- A. High-Pressure Plastic Laminate: Conforming to ISO 4586-2.
- B. Grades:
1. Horizontal Surfaces and Backsplash: ISO 10/HGS; horizontal, general purpose.
 2. Postforming: ISO 12/HGP; horizontal, general purpose, postformable.
 3. Backing Sheet: ISO 91/BKL; backer, light duty.
- C. Manufacturers: Formica, Wilsonart, Arborite, Pionite, Nevamar, or equal.
- D. Colors, and Patterns: As selected by Architect from manufacturer/suppliers' full product color range.
1. There will be no additional cost allowance for premium color selections, or for selection of different colors for different rooms up to a maximum 6 colors.

2.4 ACCESSORIES

- A. Edge Treatment: Same as laminate cladding on horizontal surfaces.
- B. Grommets: Doug Mockett & Co. Inc., Manhattan Beach, CA, 310-318-2491, or equal.
1. Type: SG Series, or EDP Series; coordinate data connection requirements with Owner.
 2. Material and Color: As selected by Architect.
- C. Countertop Braces: A&M Brace as manufactured by A & M Hardware, Inc. or equal.
1. Size brace appropriate with size of countertop.
 2. Provide Häfele "Hebgo" (1100 lb. capacity) bracket, or equal at locations where continuous raceway runs directly below countertop brace.
 3. Provide largest brace available for given countertop depth to achieve maximum countertop support.
 4. Color: As selected by Architect from full range of manufacturer's standard colors. Multiple colors may be selected.
- D. Fasteners: Type and size as required.
- E. Adhesives: VOC compliant and passing NAAWS "Heat Resistance Test.". Do not use adhesives that contain urea formaldehyde.

PLASTIC-LAMINATE-CLAD COUNTERTOPS
SECTION 12 3623
3595001

2.5 FABRICATION

- A. General:
 - 1. Obtain field measurements, and verify dimensions before fabricating work.
 - 2. Comply with NAAWS Custom Grade requirements and ANSI A161.2.
- B. Core Material: Specified MDF.
- C. Fabricate to dimensions, profiles, and details shown.
- D. Build up countertop thickness to 1-1/2 inches at front, back, and ends with additional layers of core material laminated to top.
- E. Provide specified backing sheet at configurations and installation conditions recommended in the woodworking standard.
- F. All other Countertops: Provide roll-form 180-degree edge.
- G. Unless otherwise shown, round projecting or outside corners with 3/4-inch minimum radius or clip 45-degree angle corner.
- H. Provide joints only where maximum available lengths or countertop configuration requires a joint and where interfacing with existing. Where joints are required, balance and center. Make joints neat, flush and watertight.
- I. To greatest extent possible, complete fabrication and assembly before shipment to site.
 - 1. Disassemble components only as necessary for shipment and installation.
 - 2. Where necessary for fitting at site, provide extra borders and edges so as to allow scribing and trimming to fit.
- J. Precut openings for applied fixtures and fitting, where possible. Field cuts shall be performed by the fabricator.
- K. Conceal all fasteners.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Verify that backing has been installed at appropriate locations for anchorage.
- B. Examine shop-fabricated work for completion. Complete work as required.

3.2 INSTALLATION

- A. Install countertops in accordance with Section 11 of the NAAWS and requirements shown on the Drawings.

PLASTIC-LAMINATE-CLAD COUNTERTOPS

SECTION 12 3623

3595001

- B. Install countertops and backsplashes with concealed fastenings, securely attaching to cabinet bases or countertop braces / brackets at 36 inches on center maximum. Scribe neatly to walls or other adjoining surfaces.
- C. Make joints neatly, with uniform appearance.
- D. Install work plumb, level, true, and straight, with no distortions. Install with no variation in flushness of adjoining surfaces.
- E. Countertops shall be installed as required so that the height from finish floor to top of counter, and sink rim where occurs, does not exceed the specified height at any location along the countertop after installation.
- F. Shim as required, using concealed shims.
- G. Sealant: Install sealant as specified in Section 07 9200, Joint Sealants, to close small unavoidable gaps between counter and abutting surfaces, and at sinks. Sealant shall not be a substitute for tightly scribed work.
- H. Install, at no additional charge, extra stock grommets where directed by Owner following completion of countertop installation.

END OF SECTION

*p:\sacramento\3595 tracy unified school district\001-000_villalovoz es new shade structures\08 specifications\06 spec\04 final\poet christian\12 3623_plastic-laminate-clad countertops.docx
Last Updated: November 12, 2021*

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes
 - 1. This section describes the basic requirements for the electrical work on this project.

1.2 REFERENCES

- A. National Electrical Contractors Association (NECA): Standard of Installation
- B. National Fire Protection Association (NFPA): 70E
- C. National Safety Council (NSC)
- D. Occupational Safety and Health Administration (OSHA)

1.3 SUBMITTALS

- A. Product Data
- B. Operation and Maintenance (O&M) Manuals
- C. Field Test Reports

1.4 QUALITY ASSURANCE

- A. Reference to Codes, Standards, Specifications and recommendations of technical societies, trade organizations and governmental agencies shall mean that latest edition of such publications adopted and published prior to submittal of the bid. Such codes or standards shall be considered a part of this Specification as though fully repeated herein.
- B. When codes, standards, regulations, etc. allow Work of lesser quality or extent than is specified under this Division, nothing in said codes shall be construed or inferred authority for reducing the quality, requirements, or extent of the Contract Documents. The Contract Documents address the minimum requirements for construction.
- C. Work shall be performed in accordance with all applicable requirements of the edition indicated on the drawings of all governing codes, rules and regulations including but not limited to the following minimum standards, whether statutory or not:
 - 1. California Electric Code (CEC)
 - 2. California Building Code (CBC)
 - 3. California Green Building Code (CGC)
 - 4. California Fire Code (CFC)

ELECTRICAL BASIC REQUIREMENTS

SECTION 26 0100

3595001000

5. California Energy Code (CENC)
 6. California Mechanical Code (CMC)
 7. California Plumbing Code (CPC)
- D. Standards: Equipment and materials specified under this Division shall conform to the following standards where applicable:
1. ACI American Concrete Institute
 2. ANSI American National Standards Institute
 3. ASTM American Society for Testing Materials
 4. CBM Certified Ballast Manufacturers
 5. ETL Electrical Testing Laboratories
 6. FS Federal Specification
 7. IEEE Institute of Electrical and Electronics Engineers, Inc.
 8. IPCEA Insulated Power Cable Engineer Association
 9. NEMA National Electrical Manufacturer's Association
 10. UL Underwriters' Laboratories
- E. Independent Testing Agency qualifications:
1. Testing Agency shall be an independent testing organization that will function as an unbiased authority, professionally independent of Manufacturer, Supplier and Contractor, furnishing and installing equipment or system evaluated by Testing Agency.
 2. Testing Agency shall be regularly engaged in the testing of electrical equipment, devices, installations, and systems.
 3. Testing Agency shall meet Federal Occupational Safety and Health Administration (OSHA) requirements for accreditation of independent testing laboratories, Title 9, Part 1907.
 4. On-site technical personnel shall be currently certified by the International Electrical Testing Association in electrical power distribution system testing.
 5. Testing Agency shall use technicians who are regularly employed by the firm for testing services.
 6. Contractor shall submit proof of above Testing Agency qualifications with bid documentation upon request.
- F. All base material shall be ASTM and/or ANSI standards.
- G. All electrical apparatus furnished under this Section shall conform to NEMA standards and the NEC and bear the UL label where such label is applicable.
- H. Certify that each welder performing Work has satisfactorily passed AWS qualification tests for welding processes involved and, if pertinent, has undergone re-certification.

PART 2 - PRODUCTS

- A. SEE SCHEDULES ON ELECTRICAL PLANS and other Division 26 sections

PART 3 – EXECUTION

3.1 ROUGH-IN

- A. Contractor shall verify lines, levels and dimensions indicated on the construction document drawings and shall be responsible for the accuracy of the setting out of Work and for its strict conformance with existing conditions at the Project site.
- B. Verify final locations for rough-ins with field measurements and with the requirements for the actual equipment to be connected.
- C. Refer to equipment specifications in other sections for equipment rough-in requirements.

3.3 INSTALLATION

- A. Preparation, sequencing, handling, and installation shall be in accordance with Manufacturer's written instructions and technical data particular to the product specified and/or accepted equal except as otherwise specified.
- B. Comply with Shop Drawings prepared by Manufacturer.
- C. Verify all dimensions by field measurements.
- D. Arrange for chases, slots, and openings in other building components during progress of construction, to allow for electrical installations.
- E. Coordinate the installation of required supporting devices and sleeves to be set in poured-in-place concrete and other structural components, as they are constructed.
- F. Sequence, coordinate and integrate installations of electrical materials and equipment for efficient flow of the Work. Give particular attention to large equipment requiring positioning prior to closing in the building.
- G. Where mounting height is not detailed or dimensioned, contact the Architect for direction prior to proceeding with rough-in.
- H. Coordinate connection of electrical systems with exterior underground and overhead utilities and services. Comply with requirements of governing regulations, franchised service companies and controlling agencies. Provide required connection for each service.
- I. Install systems, materials, and equipment to conform with approved submittal data, including coordination drawings, to greatest extent possible. Conform to arrangements indicated by the construction documents, recognizing that portions of the Work are indicated only in diagrammatic form. Where coordination requirements conflict with individual system requirements, refer conflict to the Architect.

ELECTRICAL BASIC REQUIREMENTS

SECTION 26 0100

3595001000

- J. Install systems, materials, and equipment level and plumb, parallel and perpendicular to other building systems and components, where installed exposed in finished spaces.
- K. Install electrical equipment to facilitate servicing, maintenance and repair or replacement of equipment components. As much as practical, connect equipment for ease of disconnecting, with minimum of interference with other installations.
- L. Coordinate electrical systems, equipment, and materials installations with other building components.
- M. Provide access panel or doors where devices or equipment are concealed behind finished surfaces.
- N. Install systems, materials and equipment giving right-of-way priority to other systems that are required to maintain a specified slope.
- O. Conform to the National Electrical Contractors' Association "Standard of Installation" for general installation practice.

3.3 CUTTING, PATCHING, PAINTING, AND SEALING

- A. Structural members shall in no case be drilled, bored, or notched in such a manner that will impair their structural value. Cutting of holes, if required, shall be done with core drill and only with the approval of the Architect and Structural Engineer.
- B. Protection of Installed Work: During cutting and patching operations, protect adjacent installations.
- C. Application of joint sealers:
 - 1. General: Comply with joint sealer Manufacturers' printed application instructions applicable to products and applications indicated, except where more stringent requirements apply.
 - 2. Installation of fire-stopping sealant: Install sealant, including forming, packing and other accessory materials, to fill openings around electrical services penetrating floors and walls, to provide fire-stops and fire-resistance ratings indicated for floor or wall assembly in which penetration occurs. Comply with installation requirements established by testing and inspecting agency.

3.4 FIELD QUALITY CONTROL

- A. General testing requirements:
 - 1. The purpose of testing is to ensure that all tested electrical equipment, both Contractor and Owner supplied, is operational and within industry and Manufacturer's tolerances and is installed in accordance with design Specifications.

ELECTRICAL BASIC REQUIREMENTS
SECTION 26 0100
3595001000

2. Tests and inspections shall determine suitability for energization.
 3. Perform tests in presence of the Owner's Representative and furnish test equipment, facilities and technical personnel required to perform tests.
 4. Tests shall be conducted during the construction period and at completion to determine conformity with applicable codes and with these Specifications.
- B. Tests: In addition to specific system test described elsewhere, tests shall include:
1. Equipment operations: Test motors for correct operation and rotation.
 2. Lighting control circuits: Test lighting circuits for correct operation through their control devices.
 3. Alarm and interlock systems: Produce malfunction symptoms in operating systems to test alarm and interlock systems. In addition, all specific tests described in the fire alarm system shall be performed.
 4. Circuit numbering verification: Select on a random basis various circuit breakers in the panelboards and cycle them on and off to verify compliance of the typed panel directories with actual field wiring.
 5. Voltage check:
 - a. At completion of job, check voltage at several points of utilization on the system that has been installed under this Contract. During test, energize all installed loads.
 - b. Adjust taps on transformers to give proper voltage, which is 118 to 122 volts for 120 volt nominal systems and proportionately equivalent for higher voltage systems. If proper voltage cannot be obtained, inform the Owner and the serving Utility Company.
- C. Contractor shall provide test power required when testing equipment before service energization and coordinate availability of test power with General Contractor after service energization. The Contractor shall provide any specialized test power as needed or specified herein.
- D. Testing safety and precautions:
1. Safety practices shall include the following requirements:
 - a. Applicable State and Local safety operating procedures.
 - b. OSHA
 - c. NSC
 - d. NFPA 70E
 2. All tests shall be performed with apparatus de-energized and grounded except where otherwise specifically required ungrounded by test procedure.
- E. Calibration of test equipment:
1. Testing Agency shall have calibration program that assures test instruments are maintained within rated accuracy.
 2. Instruments shall be calibrated in accordance with the following frequency schedule:
 - a. Field instruments: Analog, 6 month maximum; Digital, 12 months

ELECTRICAL BASIC REQUIREMENTS

SECTION 26 0100

3595001000

- maximum.
- b. Laboratory instruments: 12 months.
- c. Leased specialty equipment: 12 months where accuracy is guaranteed by lessor.
- 3. Dated calibration labels shall be visible on test equipment.
- 4. Records, which show date and results of instruments calibrated or tested, must be kept up-to-date.
- 5. Up-to-date instrument calibration instructions and procedures shall be maintained for test instrument.
- 6. Calibration standards shall be of higher accuracy than instrument tested.
- 7. Equipment used for field testing shall be more accurate than instrument being tested.
- F. Coordinate with General Contractor regarding testing schedule and availability of equipment ready for testing.
- G. Notify Owner one week in advance of any testing.
- H. Any products which fail during the tests or are ruled unsatisfactory by the Owner's Representative shall be replaced, repaired, or corrected as prescribed by the Owner's Representative at the expense of the Contractor. Tests shall be performed after repairs, replacements or corrections until satisfactory performance is demonstrated.
- I. Testing Agency shall maintain written record of tests and shall assemble and certify final test report. All test results/reports shall be submitted to the Electrical Engineer for review.
- J. Include all test results in the maintenance manuals.

3.5 CLEANING

- A. Prior to energizing of electrical equipment, the Contractor shall thoroughly clean the interior of enclosures from construction debris, scrap wire, etc. using Manufacturer's approved methods and materials.
- B. Upon completion of Project, prior to final acceptance, the Contractor shall thoroughly clean both the interior and exterior of all electrical equipment per Manufacturers approved methods and materials. Remove paint splatters and other spots, dirt, and debris.
- C. Touch-up paint any marks, blemishes or other finish damage suffered during installation.

- END OF SECTION -

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes conduit, surface raceways, J-hooks, wireways, outlet boxes, pull and junction boxes, concrete pullboxes and vaults, floor boxes.

1.2 REFERENCES

1.3 AMERICAN NATIONAL STANDARDS INSTITUTE:

- A. ANSI C80.1 - Rigid Steel Conduit, Zinc Coated.
- B. ANSI C80.3 - Specification for Electrical Metallic Tubing, Zinc Coated.

1.4 NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION:

- A. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum).
- B. NEMA FB 1 - Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit and Cable Assemblies.
- C. NEMA OS 1 - Sheet Steel Outlet Boxes, Device Boxes, Covers, and Box Supports.
- D. NEMA OS 2 - Nonmetallic Outlet Boxes, Device Boxes, Covers, and Box Supports.
- E. NEMA RN 1 - Polyvinyl Chloride (PVC) Externally Coated Galvanized Rigid Steel Conduit and Intermediate Metal Conduit.
- F. NEMA TC 2 - Electrical Polyvinyl Chloride (PVC) Tubing and Conduit.
- G. NEMA TC 3 - PVC Fittings for Use with Rigid PVC Conduit and Tubing.

1.5 SYSTEM DESCRIPTION

- A. Raceway and boxes located as indicated on Drawings, and at other locations required for splices, taps, wire pulling, equipment connections, and compliance with regulatory requirements. Raceway and boxes are shown in approximate locations unless dimensioned. Provide raceway to complete wiring system.
- B. All wiring shall be installed in raceway.
- C. Provide raceway as follows:
 - 1. Underground: Provide thickwall nonmetallic conduit. Provide cast metal boxes or nonmetallic handhole.
 - 2. In Slab Above Grade: Not permitted.
 - 3. Below Slab on Grade: Use thickwall nonmetallic conduit. Terminate with coated rigid steel elbows and short length of coated rigid steel conduit out of concrete.

RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

SECTION 26 0533

3595001000

4. Outdoor Locations, Above Grade: Provide galvanized rigid steel conduit. Provide cast metal outlet, pull, and junction boxes.
5. Wet and Damp Locations: Provide galvanized rigid steel conduit. Provide cast metal outlet, junction, and pull boxes. Provide flush mounting outlet box in finished areas.
6. Concealed Dry Locations: Provide electrical metallic tubing. Provide sheet-metal boxes. Provide flush mounting outlet box in finished areas. Provide hinged enclosure for large pull boxes where shown on drawings. Provide J-hooks when shown on plans.
7. Exposed Interior Dry Locations: Use rigid steel conduit or intermediate metal conduit below eight feet or where subject to damage. Use rigid steel conduit, intermediate metal conduit, or electrical metallic tubing above eight feet or in electrical, mechanical or telecommunication rooms. Use sheet-metal or cast metal boxes. Use flush mounting outlet box in finished areas. Provide hinged enclosure for large pull boxes.

1.6 DESIGN REQUIREMENTS

- A. Minimum Raceway Size: 0.75 inch unless otherwise specified.
- B. Minimum Raceway Size for Data Communications: 1.00 inch unless otherwise specified.
- C. Minimum Raceway Size for Telecommunications: 1.00 inch unless otherwise specified.
- D. Minimum Raceway Size for AV Systems: 1.00 inch unless otherwise specified.

1.7 CLOSEOUT SUBMITTALS

- A. Project Record Documents:
 1. Record actual routing of conduits larger than 2 inches.
 2. Record actual locations and mounting heights of outlet, pull, and junction boxes.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Protect conduit from corrosion and entrance of debris by storing above grade. Provide appropriate covering.
- B. Protect PVC conduit from sunlight.

1.9 COORDINATION

- A. Coordinate mounting heights, orientation and locations of outlets mounted above counters, benches, and backsplashes.
- B. Coordinate Work of this Division and Work of other Divisions in advance of installation. Provide additional Work to overcome tight conditions at no increase in Contract Sum.
- C. Coordinate installation of outlet boxes for equipment specified in other divisions.

PART 2 - PRODUCTS

2.1 METAL CONDUIT

- A. Rigid Steel Conduit: ANSI C80.1.
- B. Rigid Aluminum Conduit: ANSI C80.5.
- C. Intermediate Metal Conduit (IMC): Rigid steel.
- D. Fittings and Conduit Bodies: NEMA FB 1. Fittings shall be steel/malleable iron with threaded fittings. Use insulated metallic bushings with lug where ground connections are required. Use plastic bushing for non-bonding applications.

2.2 PVC COATED METAL CONDUIT

- A. Product Description: NEMA RN 1; rigid steel conduit with external PVC coating, 40 mil thick.
- B. Fittings and Conduit Bodies: NEMA FB 1; steel fittings with external PVC coating to match conduit.

2.3 FLEXIBLE METAL CONDUIT

- A. Product Description: Interlocked steel construction.
- B. Fittings: NEMA FB 1.

2.4 LIQUIDTIGHT FLEXIBLE METAL CONDUIT

- A. Product Description: Interlocked steel construction with PVC jacket.
- B. Fittings: NEMA FB 1.

2.5 ELECTRICAL METALLIC TUBING (EMT)

- A. Product Description: ANSI C80.3; galvanized tubing.
- B. Fittings and Conduit Bodies: NEMA FB 1; steel couplings and connectors. Box connectors shall have with insulated throat. Set screw type couplings.

2.6 NONMETALLIC CONDUIT

- A. Product Description: NEMA TC 2; Schedule 40 PVC.
- B. Fittings and Conduit Bodies: NEMA TC 3.

2.7 SURFACE RACEWAY (WIREMOLD)

- A. Product Description: Surface raceway as shown on plans. Raceway shall be Wiremold or equal.

RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

SECTION 26 0533

3595001000

- B. Fittings: Provide all supports, adapters, clips, elbows, covers, device fittings, and other hardware as required for a complete installation. Provide B-Line "transition" boxes to clear offset surfaces. Supports shall be concealed, exposed straps are not allowed.
- C. Finish:
 - 1. Steel raceway and associated transition boxes and exposed hardware shall be spray painted with two coats of semi-gloss acrylic enamel paint, color as directed by Architect.
 - 2. Aluminum raceway shall be provided with factory finish, color as directed by Architect. Transition boxes shall be spray painted with two coats of semi-gloss acrylic enamel paint, color as directed by Architect.
 - 3. Plastic raceway shall be provided with factory finish, color as directed by Architect. Transition boxes shall be spray painted with two coats of semi-gloss acrylic enamel paint, color as directed by Architect.
 - 4. Coordinate all colors with Architect prior to ordering.

2.8 J-HOOKS

- A. Product Description: Low voltage signal cable J-Hooks shall be Panduit. Provide with support device for construction encountered.

2.9 WIREWAY

- A. Product Description: General purpose for indoor applications and raintight type for outdoor locations wire way.
- B. Knockouts: Manufacturer's standard.
- C. Cover: Hinged cover with full gaskets.
- D. Connector: Flanged.
- E. Fittings: Lay-in type with removable top, bottom, and side; captive screws and drip shield for outdoor.
- F. Finish: Rust inhibiting primer coating with gray enamel finish.

2.10 OUTLET BOXES

- A. All boxes shall be suitable for the environment in which they are installed.
- B. Sheet Metal Outlet Boxes: NEMA OS 1, galvanized steel.
 - 1. Luminaire and Equipment Supporting Boxes: Rated for weight of equipment supported; furnish 0.5-inch male fixture studs where required.
 - 2. Boxes for shall be 1.5-inch-deep by 4-inch square minimum for single devices.
 - 3. Boxes for shall be 1.5-inch-deep by 4-11/16 inch square minimum for two devices.
 - 4. Boxes for data and signal outlets shall be 2-1/8-inch-deep by 4-11/16-inch square minimum.
 - 5. Concrete Ceiling Boxes: Concrete type.

RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

SECTION 26 0533

3595001000

6. Provide rings as required.

- C. Cast Boxes: NEMA FB 1, Type FD, aluminum. Furnish gasketed cover by box manufacturer. Furnish threaded hubs.

2.11 BOX EXTENSIONS

- A. At rooms being remodeled and where existing walls are to receive new finish material, replace existing plaster rings with new rings.

2.12 PULL AND JUNCTION BOXES

- A. Boxes having an internal volume less than 100 cubic inches shall be as specified for outlet boxes. Boxes having internal volume greater than 100 cubic inches shall be of panelboard type construction except that covers shall be secured by screws or bolts.
- B. Boxes exposed to rain or installed in wet locations shall be specifically designed for the purpose.
- C. All boxes shall be installed so that covers are accessible after completion of the installation.
- D. Boxes shall not be installed in finished areas unless specific approval for such installation is granted by Architect.

2.13 CONCRETE PULLBOXES AND VAULTS

- A. Boxes: Boxes shall be precast, high density reinforced concrete. In areas of vehicular traffic, boxes shall be H20 rated.
- B. Extensions: Extensions shall be provided at each pullbox. Provide a minimum of (1) extension. Provide additional extension(s) as required to provide space in box for code required cable bending.
- C. Covers: Covers in concrete or asphalt shall be galvanized. In all other areas, covers shall be steel checker plate. In areas of vehicular traffic, lids shall be galvanized steel, H20 rated. All covers shall be provided with hold-down bolts.
- D. Floor: Provide poured concrete slab as detailed on plans. At H20 rated boxes, provide manufacturer's concrete slab.
- E. Size: Provide size as noted on plans. If size is not shown, provide boxes sized per codes.
- F. Labeling: Covers shall be factory marked as shown on plans.

2.14 FLUSH MULTI SERVICE FLOOR BOXES (4 PORT)

- A. Floor boxes shall be cast iron, fully adjustable, Walker RFB4-CI-1 with FPBTCAL cover. Provide brackets required to mount devices shown on plans. Provide blank plates at unused ports.

RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

SECTION 26 0533

3595001000

2.15 FLUSH MULTI SERVICE FLOOR BOXES (11 GANG):

- A. Floor boxes shall be steel, fully adjustable, Walker RFB11 with RFB119BTCAL cover. Provide brackets required to mount devices shown on plans. Provide blank plates at unused ports.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify outlet locations and routing and termination locations of raceway prior to rough-in.

3.2 EXISTING WORK

- A. Remove exposed abandoned raceway, including abandoned raceway above accessible ceiling finishes. Cut raceway flush with walls and floors, and patch surfaces.
- B. Remove concealed abandoned raceway to its source.
- C. Disconnect abandoned outlets and remove devices. Remove abandoned outlets when raceway is abandoned and removed. Install blank cover for abandoned outlets not removed.
- D. Maintain access to existing boxes and other installations remaining active and requiring access. Modify installation or provide access panel.
- E. Extend existing raceway and box installations using materials and methods [compatible with existing electrical installations, or] as specified.
- F. Clean and repair existing raceway and boxes to remain or to be reinstalled.
- G. At rooms being remodeled and where existing walls are to receive new finish material, replace existing plaster rings with new rings with depth required to bring box flush with new finish. Contractor shall review Architectural drawings prior to bid to note walls receiving new finishes (tackboards, sheetrock, etc.) and include the necessary work in bid.

3.3 INSTALLATION

- A. Ground and bond raceway and boxes.
- B. Fasten raceway and box supports to structure and finishes.
- C. Identify raceway and boxes.
- D. Arrange raceway and boxes to maintain headroom and present neat appearance.

3.4 INSTALLATION - RACEWAY

- A. Raceway routing is shown in approximate locations unless dimensioned. Route to complete wiring system.

RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

SECTION 26 0533

3595001000

- B. Unless otherwise specified, all raceway shall be installed concealed. Raceway may be run exposed on unfinished walls, in attic spaces, in electrical rooms and when routed to surface panels, cabinets or gutters.
- C. Arrange raceway supports to prevent misalignment during wiring installation.
- D. Support raceway using coated steel or malleable iron straps, lay-in adjustable hangers, clevis hangers, and split hangers.
- E. Group related raceway; support using conduit rack. Construct rack using steel channel and provide space on each for 25 percent additional raceways.
- F. Do not support raceway with wire or perforated pipe straps. Remove wire used for temporary supports
- G. Do not attach raceway to ceiling support wires or other piping systems.
- H. Construct wire way supports from steel channel.
- I. Route exposed raceway parallel and perpendicular to walls.
- J. Route raceway installed above accessible ceilings parallel and perpendicular to walls.
- K. Route conduit in and under slab from point-to-point.
- L. Maintain clearance between raceway and piping for maintenance purposes.
- M. Maintain 12-inch clearance between raceway and surfaces with temperatures exceeding 104 degrees F.
- N. Cut conduit square using saw or pipe cutter; de-burr cut ends.
- O. Bring conduit to shoulder of fittings; fasten securely.
- P. Join nonmetallic conduit using cement as recommended by manufacturer. Wipe nonmetallic conduit dry and clean before joining. Apply full even coat of cement to entire area inserted in fitting. Allow joint to cure for minimum 20 minutes.
- Q. Install conduit hubs to fasten conduit to sheet metal boxes in damp and wet locations and to cast boxes.
- R. Install no more than equivalent of three 90-degree bends between boxes. Install conduit bodies to make sharp changes in direction, as around beams. Install factory elbows for bends in metal conduit larger than 2-inch size.
- S. Avoid moisture traps; install junction box with drain fitting at low points in conduit system.
- T. Install fittings to accommodate expansion and deflection where raceway crosses seismic and expansion joints.
- U. Install suitable pull string or cord in each empty raceway except sleeves and nipples.

RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

SECTION 26 0533

3595001000

- V. Install suitable caps to protect installed conduit against entrance of dirt and moisture.
- W. Surface Raceway:
 - 1. Anchor raceway to structural members using screws. Supports shall be concealed. Space screws 24" maximum on center. Each run shall have a minimum of (2) screws.
 - 2. Mount plumb and level.
 - 3. Install insulating bushings and inserts at connections to outlets and corner fittings.
 - 4. Raceway shown on plans is schematic. Contractor shall coordinate exact routing and installation with building conditions and provide all parts, pieces, elbows, transition boxes and other items as required for a complete, closed and professionally installed installation.
 - 5. Coordinate exact routing with Architect prior to installation.
- X. J-Hooks:
 - 1. Provide J-hooks 48" maximum on center.
 - 2. All cable to be run parallel and perpendicular to building lines.
 - 3. Provide mounting hardware as required.
 - 4. Provide Unistrut channels between structural members as required.
 - 5. Provide 24" long 2" conduit sleeves through walls, draft stops, etc. Provide as many as necessary to accommodate cables in contract plus two extra capped at each end for future cabling. All conduits shall be provided with bushed ends.
- Y. Close ends and unused openings in wire way.

3.5 EXCAVATING AND TRENCHING:

- A. Perform all excavations as required for the installation of the work included under this Section, including shoring of earth banks to prevent cave-ins and to protect workmen and equipment.
- B. Restore all surfaces, roadways, walks, curbs, walls, existing underground installation, etc., damaged or cut as a result of the excavations to their original condition in a manner approved by the Architect.
- C. Stop machine excavation for trenches, in solid ground, several inches above required grade line, then trim trench bottom by hand to accurate grade so that a firm and uniform bearing throughout entire length of duct is provided. In lieu of above hand excavation in bottom of trench, Contractor may excavate to depth no less than 6" below required grade line and place a bed of sand or granular soil, properly compacted to provide a uniform grade and to provide a firm support for duct throughout its entire length.
- D. Minimum conduit depth of pipe crown shall be 2'0" below finished or natural grade, unless detailed otherwise on Drawings. Conduits under parking lots, roadways, driveways, fire truck access routes, and other areas subject to vehicular traffic shall be installed a minimum of 24" below grade.

3.6 BACKFILLING:

- A. No backfilling operations shall begin until the required tests and inspection has been made. Should any of the work be enclosed or covered up before it has been approved, Contractor shall, at his expense, uncover the work.
- B. After it has been inspected, tested, and approved, he shall make all repairs necessary to restore the work of other contractors to the condition in which it was found at the time of uncovering.
- C. Except under existing paved area, walks, roads, or similar surfaces, and in cases where rock is encountered, backfill more than 12" above the top of the pipe shall be made using suitable excavated material placed in 6" layers measured before compaction, and tamped by machine.
- D. Surface work shall be replaced to match the existing.
- E. Entire backfill for bored excavations under existing pavement, walks, roads, or similar surfaces, shall be made with clean sand compacted by flooding.
- F. The contractor shall install a marking tape 6" below grade and directly above all electrical conduits. The tape shall consist of a 4 mil insert plastic film specifically formulated for prolonged use underground. It shall be highly resistant to alkalis, acids and other destructive agents found in the soil. Tape shall have a minimum tensile strength of 20 lbs. per 3" with strips and a minimum elongation of 500%. Tape shall bear a continuous painted message repeated every 16" to 36" warning of the installation buried below. The message shall read "CAUTION – ELECTRICAL POWER LINE BURIED BELOW" or "CAUTION – ELECTRICAL SIGNAL LINES BURIED BELOW" as applies. Installation instruction for the tape shall be printed with each message along the entire length. The tape shall be as that manufactured by Reef Industries, Inc., or approved equal. For those installations involving non-metallic pipe, tape shall be aluminum foil encased in two layers of inert plastic film enabling the tape to be inductively located. Terre Tape "D" Warning Tapes are acceptable. When conduit below is plastic, tape shall have metallic content and shall respond to metal detectors. Do not exclude this. It will be required to verify the installation of this tape.

3.7 FLASHING AND SEALING:

- A. Flash and counterflash roof and wall penetrations in manner described under other applicable sections of this Specification and as approved by the Architect.
- B. Conduits, ducts, etc., passing through finished walls and ceilings shall be fitted with steel escutcheon plates, chrome or paint finish as directed.
- C. Conduits which penetrate floor slabs and concrete or masonry walls shall be grouted and sealed watertight at penetration.
- D. Conduits penetrating exterior walls other than concrete or masonry shall be sealed watertight with polyurethane sealant.

RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

SECTION 26 0533

3595001000

- E. Underground conduits stubbing up into a room shall be sealed around cables or pullstring with foam sealant.
- F. All flashing and sealing shall be provided by this Contractor.

3.8 INSTALLATION – BOXES

- A. Boxes shall be accurately placed as shown on Drawings or as close thereto as possible. Contractor shall refer to Drawings, specifications, and submittals covering work of the other trades to coordinate outlet location. In the event of conflict between planned locations of outlet and other equipment or furnishing, Contractor shall not proceed until direction has been given by Architect.
- B. Unless otherwise specified or shown on Drawings, boxes shall be flush mounted with front edge of box or ring flush with wall or ceiling finish. Use plaster ring of appropriate depth in plastered or gypboard applications. Contractor shall review architectural drawings and note wall and ceiling construction and finishes for each wall.
- C. Boxes shall not be installed back-to-back in walls. To prevent sound transfer, outlets, switches, etc. shown on opposing sides of the same wall shall be installed in separate stud spaces, except that outlets installed at different elevations may occupy the same stud space when box separation exceeds 18". Where these requirements cannot be met, Contractor shall provide insulation material between boxes.
- D. Orient boxes to accommodate wiring devices.
- E. Install pull boxes and junction boxes above accessible ceilings and in unfinished areas only.
- F. In Accessible Ceiling Areas: Install outlet and junction boxes no more than 6 inches from ceiling access panel or from removable recessed luminaire.
- G. Locate flush mounting box in masonry wall to require cutting of masonry unit corner only. Coordinate masonry cutting to achieve neat opening.
- H. Install stamped steel bridges to fasten flush mounting outlet box between studs.
- I. Install flush mounting box without damaging wall insulation or reducing its effectiveness.
- J. Install adjustable steel channel fasteners for hung ceiling outlet box.
- K. Do not fasten boxes to ceiling support wires or other piping systems.
- L. Support boxes independently of conduit.
- M. Install gang box where more than one device is mounted together. Do not use sectional box.
- N. Install gang box with plaster ring for single device outlets.

3.9 INSTALLATION CONCRETE PULLBOXES AND VAULTS

- A. Install boxes flush with finished grade or surface material.
- B. Install hold down bolts for all covers.
- C. Ground bond steel cover plate with insulated green grounding conductor.
- D. Grout between box and extension(s).
- E. Any box installed in areas of vehicular traffic shall be H20 rated. Contractor shall verify this requirement prior to ordering.

3.10 INTERFACE WITH OTHER PRODUCTS

- A. Install conduit to preserve fire resistance rating of partitions and other elements.
- B. Route conduit through roof openings for piping and ductwork or through suitable roof jack with pitch pocket. Coordinate location with roofing installation.
- C. Locate outlet boxes to allow luminaires positioned as indicated on reflected ceiling plan.
- D. Align adjacent wall mounted outlet boxes for switches, thermostats, and similar devices.

3.11 ADJUSTING

- A. Adjust flush-mounting outlets to make front flush with finished wall material.
- B. Install knockout closures in unused openings in boxes.

3.12 CLEANING

- A. Clean interior of boxes to remove dust, debris, and other material.
- B. Clean exposed surfaces and restore finish.

- END OF SECTION -

PART 1 – GENERAL

1.1 SUMMARY

- A. This section describes the requirements for the cabinets and enclosures for this project.

1.2 REFERENCES

- A. National Electrical Manufacturer's Association (NEMA):
 - 1. NEMA 250; Enclosures for Electrical Equipment.
 - 2. NEMA ICS 1; Industrial Control and Systems.
 - 3. NEMA ICS 4; Terminal Blocks and Industrial use.
 - 4. NEMA ICS 6; Enclosures for Industrial Controls and Systems.
- B. Underwriters Laboratories (UL):
 - 1. UL 50; Enclosures for Electrical Equipment.
 - 2. UL 65; Standards for Wired Cabinets.
 - 3. UL 1059; Terminal Blocks.
 - 4. UL 1773; Termination Boxes.

1.3 SUBMITTALS

- A. Product Data: Submit manufacturer's standard data for enclosures, and terminal cabinets.
- B. Manufacturer's Instructions: Submit application conditions and limitations of use stipulated by product testing agency specified under Regulatory Requirements. Include instructions for storage, handling, protection, examination, preparation, and installation of product.

1.4 QUALITY ASSURANCE

- A. All materials, equipment and parts comprising the units specified herein shall be new, unused, and currently under production.
- B. Only products and applications listed in this Section may be used on the Project unless otherwise submitted.

PART 2 - PRODUCTS

2.1 CABINETS AND ENCLOSURES

- A. Description: Interior Locations: NEMA 1. Exterior locations: NEMA 3R
- B. Construction: Shall be code gauge galvanized steel with standard concentric knockouts for conduit terminations. Size shall be as indicated on Drawings.

CABINETS AND ENCLOSURES
SECTION 26 2716
3595001000

- C. Backboard: Furnish 5/8-inch-thick plywood backboard for mounting terminal blocks. Paint with (3) coats of fire retardant white paint.
- D. Finish: Manufacturer's standard gray baked enamel finish.
- E. Covers: Continuous hinged steel door, lockable and keyed to match panelboard locks. Provide padlock hasp at exterior locations.
- F. Mounting:
 - 1. Flush cabinets shall be furnished with concealed trim clamps and shall be not less than 4 inches deep.
 - 2. Surface cabinets shall be furnished with screw cover trim, flush hinged door and shall not be less than 6 inches deep.

2.2 SIGNAL TERMINAL BACKBOARDS

- A. Furnish cabinet with 3/4-inch fire retardant plywood mounting backboard on interior unless otherwise indicated on Drawings. 8' high x width shown on plans or as required
- B. Finish: Paint with (3) coats of fire-retardant white paint

2.3 TERMINAL BLOCKS AND ACCESSORIES

- A. Terminal blocks: NEMA ICS 4; UL listed.
- B. Power terminals: Unit construction type, closed-back with tubular pressure screw connections, rated 600 volts.
- C. Identification: Identify terminal strips with permanent numbers.
- D. Wiring diagram: Provide wiring diagram in protective pocket on inside front cover of cabinet. Diagram shall indicate control wiring, connections, and layout of components within enclosure.

2.4 HINGED COVER ENCLOSURES

- A. Description: NEMA 250, Type 1 (Interior) and 3R (Exterior) steel enclosure
 - 1. Covers: Continuous hinge, held closed by flush latch operable by key.
 - 2. Furnish interior plywood panel for mounting terminal blocks and electrical components; finish with white enamel.
 - 3. Enclosure Finish: Manufacturer's standard enamel.

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Contractor shall thoroughly examine Project site conditions for acceptance of cabinets and enclosures installation to verify conformance with Manufacturer and Specification tolerances. Do not commence with installation until all conditions are made satisfactory.

3.2 INSTALLATION

- A. Set cabinets and enclosures plumb and symmetrical with building lines. Furnish and install all construction channel bolts, angles, etc. required to mount all equipment furnished under this Section of the Specifications.
- B. Cabinets and enclosures shall be anchored and braced to withstand seismic forces calculated in accordance with that referenced in Section 26 0100: Basic Electrical Requirement.
- C. "Train" interior wiring, bundle and clamp using specified plastic wire wraps.
- D. Install interior cabinets with top of enclosure 6'6" above finished floor.
- E. Install exterior cabinets with top of enclosure 6'6" above finished grade.
- F. Replace doors or trim exhibiting dents, bends, warps or poor fit that may impede ready access, security or integrity.
- G. Terminate conduit in cabinet with lock nut and grounding bushing.
- H. Terminate wiring on terminal blocks and identify each with heat shrink tags.

3.3 CLEANING

- A. Touch up scratched or marred surfaces to match original finish.
- B. Clean electrical parts to remove conductive and harmful materials.
- C. Remove dirt and debris from enclosure.
- D. Clean existing panelboards and load centers to remain or to be reinstalled.

- END OF SECTION -

PART 1— GENERAL

1.1 SUMMARY

- A. Section Includes
 - 1. This section describes the requirements for the circuit protective devices for this project.

1.2 REFERENCES

- A. Federal Specification (FS):
 - 1. FS W-C-375; Circuit Breakers, Molded Case, Branch Circuit and Service.
 - 2. FS W-F-870; Fuseholders (for Plug and Enclosed Cartridge Fuses).
- B. Underwriters Laboratories, Inc. (UL):
 - 1. UL 248(1-16); Low-Voltage Fuses.
 - 2. UL 489; Molded-Case Circuit Breakers, Molded-Case Switches and Circuit Breaker Enclosures.
 - 3. UL 512; Fuseholders.
 - 4. UL 1066; Low Voltage AC and DC Power Circuit Breakers Used in Enclosures.
- C. National Electrical Manufacturer Association (NEMA):
 - 1. NEMA AB 1; Molded Case Circuit Breakers.

1.3 SUBMITTALS

- A. Product Data
- B. Operation and Maintenance (O&M) Manuals

1.4 QUALITY ASSURANCE

- A. All materials, equipment and parts comprising the units specified herein shall be new, unused, and currently under production.
- B. Only products and applications listed in this Section may be used on the Project unless otherwise submitted.

1.5 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Delivery: Overcurrent Protective Device components shall not be delivered to the Project site until protected storage space is available. Storage outdoors covered by rainproof material is not acceptable. Equipment damaged during shipment shall be replaced and returned to Manufacturer at no cost to Owner.

CIRCUIT PROTECTIVE DEVICES

SECTION 26 2800

3595001000

- B. Storage: Store in a clean, dry, ventilated space free from temperature extremes. Maintain factory wrapping or provide a heavy canvas/plastic cover to protect units from dirt, water, construction debris and traffic. Provide heat where required to prevent condensation.
- C. Handling: Handle in accordance with Manufacturer's written instructions. Be careful to prevent internal component damage, breakage, denting and scoring. Damaged units shall not be installed. Replace damaged units and return equipment to Manufacturer.

PART 2 - PRODUCTS

2.1 FUSES

- A. General: All power fuses shall be time-delay, high interrupting (300 K AIC), current limiting type, unless otherwise noted on the Drawings. All fuses shall be the product of a single Manufacturer and shall be selectively coordinated when applied in 2:1 ratios. Types of fuses shall be as follows:
 - 1. 0 - 600 amperes: UL Class J, dual element, time delay type fuse with separate overload and short-circuit elements. The fuse shall hold 500% of rated current for a minimum of 10 seconds.
 - 2. 601 - 4000 amperes: UL Class L, time delay type fuses with 99.9% pure silver fuse links and "O-rings" to seal between the end bells and the fuse barrel. Fuses shall hold 500% of rated current for a minimum of 4 seconds, clear 20 times rated current in 0.01 seconds or less.
 - 3. Motor branch circuit fuses (0-600 amperes): UL Class J dual element, time delay type fuse. Motor branch circuit fuses shall be sized for Type 2 coordination for the motor controller and back-up motor overload protection and shall be coordinated with motor starter overload relay heaters.
- B. Control and instrument fuses shall be suitable for installing in blocks or fuse holders. Exact type and rating shall be as recommended by the Manufacturer of the equipment being protected.
- C. Fuses for installation in current limiting circuit breakers or motor circuit protectors shall meet the specific requirements of the Manufacturers of that equipment to ensure compatibility.

2.2 MOLDED CASE CIRCUIT BREAKERS

- A. Unless noted otherwise, circuit breakers shall be molded case, bolt on and trip indicating.
- B. Where stationary molded case circuit breakers are indicated on the Drawings to be current limiting type, they shall be current limiting as defined by UL 489 and shall not employ any fusible elements.
- C. Circuit breakers shall have interrupting capacity not less than that indicated on the Drawings or if not indicated, not less than 25,000 RMS symmetrical amps for 480

volt systems and 10,000 RMS symmetrical amps for 208 volt systems.

- D. Covers shall be sealed on non-interchangeable breakers and trip unit covers shall be sealed on interchangeable trip breakers to prevent tampering. Circuit breaker ratings shall be clearly visible after installation or engraved nameplates shall be provided stating the rating. All ferrous parts shall be plated to minimize corrosion.
- E. Circuit breakers shall be toggle, quick-make and quick-break operating mechanisms with trip-free feature to prevent contacts being held closed against overcurrent conditions in the circuit. Trip position of the breakers shall be clearly indicated by operating handles moving to a center position.
- F. Multipole breakers shall have a single handle to open and close all contacts simultaneously in both manual operation and under automatic tripping. Interpole barriers shall be provided inside the breaker to prevent any phase-to-phase flashover. Each pole of the breaker shall have means for Arc extinguishing.
- G. All terminals shall be rated for aluminum or copper wire.
- H. Unless noted otherwise, circuit breakers with trip ratings 400 amp and smaller shall be ambient temperature compensated, thermal magnetic type unless otherwise noted. Breakers shall be of full size, 1" per pole type. Panels with more than one branch breaker larger than 100 amps shall be installed in distribution type panels.
- I. Accessories: Provide accessories as noted on the Drawings, i.e. shunt-trip, auxiliary contacts, undervoltage trip, alarm switch, etc.
- J. Spaces in the boards shall be able to accept any combination of 1, 2 or 3 pole circuit breakers as indicated. Provide all necessary bus, device supports and mounting hardware sized for frame, not trip rating.
- K. Series rated breakers are not acceptable unless specifically noted on the Drawings.

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Contractor shall thoroughly examine Project site conditions for acceptance of cabinets and enclosures installation to verify conformance with Manufacturer and Specification tolerances. Do not commence with installation until all conditions are made satisfactory.

3.2 INSTALLATION

- A. Install overcurrent protective devices in accordance with Manufacturer's written instructions, as indicated on the Drawings and as specified herein.
- B. Tighten electrical connectors and terminals; including screws and bolts, in accordance with equipment Manufacturers published torque-tightening values for

CIRCUIT PROTECTIVE DEVICES
SECTION 26 2800
3595001000

equipment connectors. Where Manufacturers torque requirements are not indicated tighten connectors and terminals to comply with tightening torque specified in UL Standard 486A.

- C. Install overcurrent protective devices and accessories in accordance with Manufacturer's written instructions and with recognized industry practices to ensure that protective devices comply with requirements. All devices shall be installed in accordance with applicable CEC and NEMA standards for installation.
- D. Circuit breakers serving "Fire Alarm Control Panel(s)" shall be red in color.

3.3 FIELD QUALITY CONTROL

- A. The Contractor shall supply a suitable and stable source of electrical power to each test site.
- B. Testing of overcurrent protective devices shall be done only after all devices are installed and system is energized.
- C. Prefunctional testing:
 - 1. Visual and mechanical inspection:
 - a. Inspect for physical damage, defects alignment and fit.
 - b. Perform mechanical operational tests in accordance with Manufacturer's instructions.
 - c. Compare nameplate information and connections to Contract Documents.
 - d. Check tightness of all control and power connections.
 - e. Check that all covers, barriers and doors are secure.
 - 2. Electrical tests:
 - a. Circuit continuity: All feeders shall be tested for continuity. All neutrals shall be tested for improper grounds.
 - b. Determine that circuit breaker will trip under overcurrent condition, with tripping time in conformance with NEMA AB 1 requirements.
 - c. Test all circuit breakers with frame size 225 amps and larger and 10 percent of all circuit breakers with frame sizes less than 225 amps in each panelboard, distribution board, switchboard, etc. unless otherwise noted.
- D. Contractor shall replace at no costs to the Owner all devices which are found defective or do not operate within factory specified tolerances.
- E. Contractor shall submit the final test report for review prior to Project closeout and final acceptance by the Owner. Test report shall indicate test dates, devices tested, results, observation, deficiencies and remedies. Test report shall be included in the operation and maintenance manuals.

3.4 ADJUSTING

CIRCUIT PROTECTIVE DEVICES
SECTION 26 2800
3595001000

- A. Adjust circuit breaker trip settings for coordination with other overcurrent protective devices in system.
- B. Adjust circuit breaker trip settings for adequate protection from overcurrent and fault currents.

3.5 CLEANING

- A. Upon completion of Project prior to final acceptance the Contractor shall thoroughly clean overcurrent protective devices per Manufacturer's approved methods and materials. Remove paint splatters and other spots, dirt and debris.

- END OF SECTION -

PART 1 - GENERAL

1.1 SUMMARY

- A. This section describes the basic requirements for the fire alarm system work on this project.

1.2 REFERENCES AND STANDARDS

- A. California Fire Code (CFC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. American National Standards Institute, Inc. (ANSI): ANSI C62.41
- C. National Fire Protection Association (NFPA): 72, 101
- D. Underwriter Laboratories, Inc. (UL)
 - 1. UL 38; Manual Signaling Boxes Fire Alarm Systems.
 - 2. UL 268; Smoke Detectors for Fire Alarm Signaling Systems.
 - 3. UL 268 A; Smoke Detectors for Duct Application.
 - 4. UL 464; Audible Signal Appliances.
 - 5. UL 497B; Protectors for Data Communications and Fire Alarm Circuits.
 - 6. UL 521; Heat Detectors for Fire Protective Signaling Systems.
 - 7. UL 864; Control Units and Accessories for Fire Alarm Systems.
 - 8. UL 1424; Cables for Power-Limited Fire-Alarm Circuits.
 - 9. UL 1480; Speakers for Fire Alarm, Emergency and Commercial and Professional Use.
 - 10. UL 1481; Power Supplies for Fire-Protective Signaling Systems.
 - 11. UL 1638 Visual Signaling Appliances Standard.
 - 12. UL 1711; Amplifiers for Fire Protective Signaling Systems.
 - 13. UL 1971 Signal Devices for Hearing Impaired.
- E. International Engineering Consortium (IEC): IEC 60849
- F. Factory Mutual System (FM) approval guide: FM P7825

1.3 SUBMITTALS

- A. Product Data
- B. Operation and Maintenance (O&M) Manuals
- C. Field Test Reports

**FIRE ALARM SYSTEM
SECTION 26 6116
3595001000**

1.4 QUALITY ASSURANCE

- A. All materials, equipment and parts comprising the units specified herein shall be new, unused, and currently under production.
- B. Only products and applications listed in this Section and in the Electrical Drawings may be used on the Project unless otherwise submitted.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Products furnished by the Manufacturers indicated in the Electrical Drawings and this section shall be acceptable if in compliance with all features specified herein
 - 1. Edwards (EST)
 - 2. System Sensor

2.2 CONDUIT AND WIRE

- A. Conduit:
 - 1. Conduit shall be in accordance with the California Electrical Code (CEC).
 - 2. Where required, all wiring shall be installed in conduit. Conduit fill shall not exceed 40 percent of interior cross-sectional area where three or more cables are contained within a single conduit.
 - 3. Cable must be separated from any open conductors of power, or Class 1 circuits, and shall not be placed in any conduit, junction box or raceway containing these conductors, per CEC Article 760-29.
 - 4. Wiring for 24-volt DC control, alarm notification, emergency communication and similar power-limited auxiliary functions may be run in the same conduit as initiating and signaling line circuits. All circuits shall be provided with transient suppression devices and the system shall be designed to permit simultaneous operation of all circuits without interference or loss of signals.
 - 5. Conduit shall not enter the fire alarm control panel or any other remotely mounted control panel equipment or back boxes, except where conduit entry is specified by the Life Safety Control Panel (LSCP) manufacturer.
 - 6. Connectors shall be compression type fittings to join EMT to a box or enclosure and to couple two ends of EMT conduit. Fittings shall be: Zinc plated, steel UL listed concrete tight, and threadless where connecting to conduit. Male hub threads -NPSM (American National Standard Pipe Straight Mechanical) where connecting to box or cabinet with steel locknuts.
- B. Wire:
 - 1. Wiring shall be in accordance with state and national codes (e.g., CEC Article 760) and as recommended by the manufacturer of the fire alarm system. Number and size of conductors shall be as recommended by the fire alarm system manufacturer, but not less than 18 AWG (1.02 mm) for Initiating Device Circuits

and Signaling Line Circuits, and 14 AWG (1.63 mm) for Notification Appliance Circuits.

2. All wire and cable shall be listed and/or approved by a recognized testing agency for use with a protective signaling system.
 3. Wire and cable shall be installed in conduit or metal surface raceway when in exposed spaces. Minimum size of conduit shall be 3/4" inch. Utilize Wiremold 700 series surface raceway (in lieu of conduit) for area where conduit cannot be installed concealed. Cable above accessible ceiling can be installed free air when using applicable cable. Support all free air cable every 48" with j-hooks.
 4. All field wiring (with exception of external communications Ethernet) shall be electrically supervised for open circuit and ground fault.
 5. The LSCP shall be capable of T-tapping NFPA Style 4 (Class B) Signaling Line Circuits (SLCs). Systems which do not allow or have restrictions in, for example, the number of T-taps, length of T-taps etc., is not acceptable.
- C. Terminal Boxes, Junction Boxes and Cabinets: All boxes and cabinets shall be UL listed for their use and purpose.
- D. The fire alarm control panel shall be connected to a separate dedicated branch circuit, maximum 20 amperes. This circuit shall be labeled at the main power distribution panel as FIRE ALARM. LSCP primary power wiring shall be 12 AWG. The control panel cabinet shall be grounded securely to either a cold water pipe or grounding rod. The control panel enclosure shall feature a quick removal chassis to facilitate rapid replacement of the LSCP electronics.

2.3 FIRE ALARM DEVICES

- A. Initiation: See Component Schedule in the Electrical Drawings for details
1. Monitor Module
 2. Heat Detector
 3. Smoke Detector
- B. Notification: See Component Schedule in the Electrical Drawings for details
1. Strobe
 2. Combination Speaker-Strobe
 3. Sync Module

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Contractor shall thoroughly examine Project site conditions for acceptance of cabinets and enclosures installation to verify conformance with Manufacturer and Specification tolerances. Do not commence with installation until all conditions are made satisfactory.

FIRE ALARM SYSTEM
SECTION 26 6116
3595001000

3.2 INSTALLATION

A. General:

1. The 120/208-volt, 3 wire, 60 cycles AC emergency power supply required to power the system. Connect to red colored circuit breaker(s) in panel board. Identify circuit as "Fire Alarm Circuit Control".

B. Wiring:

1. Individual input and output device addressability as well as remote sensitivity measurement, supervision and power shall all be performed on the same pair of wires. Wiring shall be Class B.
2. Each Class B initiating circuit shall consist of a two (2)-wire circuit. allowing a maximum of 20 T-taps and not requiring any end-of-line device for supervision. Each initiating circuit shall accommodate up to 75% of the manufacturers maximum addressable programmable initiating devices, to allow for future expansion.
3. Wiring for shielding certain conductors from others or routing in separate raceways, shall be as recommended by the Manufacturer's current requirements.
4. All wiring shall be installed in a continuous steel conduit or metal surface raceway when in exposed spaces. All conduit fittings shall be steel compression. Conduit shall be of the size recommended by the equipment Supplier with a minimum of 3/4" inch.
5. Wire color-coding shall remain the same throughout the system.
6. No wiring other than that directly associated with life safety/fire alarm detection, alarms, or auxiliary fire protection functions (no 120 VAC), shall be permitted in life safety/fire alarm conduits.
7. Make conduit and wiring connections to sprinkler flow switches, PIV's, sprinkler valve monitors, door hold-open/closure devices, smoke management fans, smoke dampers, elevator controller, emergency generator, etc.
8. All wiring shall be checked and tested to ensure that there are no grounds, opens or shorts.
9. All life safety/fire alarm junction boxes shall be color-coded and marked
10. Wire nut splices are not allowed.
11. Wires shall be numbered at each connection, termination, and junction point. Wire numbering tags shall be Brady Perma-Code, Westline or equal wire markers. Each group of wires shall be tagged with its destination at each panel, terminal box or junction box.
12. All wire used on the life safety/fire alarm and communication system shall have a minimum insulation rating of 105 degrees C. Bell wire or thermostat wire is not acceptable.

3.3 FIELD QUALITY CONTROL

A. Pre-functional testing: Visual and mechanical inspection

1. Inspect for physical damage, defects alignment and fit.

2. Perform mechanical operational tests in accordance with Manufacturer's instructions.
3. Compare nameplate information and connections to Contract Documents.
4. Check tightness of all control and power connections.
5. Check that all covers, barriers and doors are secure.
6. Visually check all sampling pipes to ensure that all joints, fittings, bends, sampling points, etc., comply with the Specification.
7. Check the air sampling system to ensure the following features are operational and programmed in accordance with the specification.
 - a. Alarm threshold levels
 - b. Pipes in use
 - c. Detector address
 - d. Clock and date
 - e. Time delays
 - f. Air flow fault thresholds
 - g. Display buttons operable
 - h. Check to ensure that all ancillary warning devices operate as specified.
 - i. Check interconnection with LSCP to ensure correct operation.

B. Pre-functional testing: Electrical tests

1. The system shall be completely tested prior to final acceptance testing. All points shall be tested from point of initiation to the final point or points of annunciation. All circuits shall be tested for continuity and ability to transmit the required signal correctly to the LSCP. Any problem due to wrong wire type, wire twist, impedance, mismatches, noise filtering or shielding shall be completely corrected during pretesting and prior to any final acceptance tests.
2. Testing shall include each and every device in the system. Coordinate with other trades as necessary for testing.
3. Tamper switches: Verify "trouble" signal is received and alarmed on closing of each valve.
4. Smoke detectors and duct smoke detectors: Test with actual or approved artificial smoke. Verify that reset does not occur when devices are cleared of smoke. Verify supervisory circuit function. Perform pressure differential test on all duct-mounted smoke detectors.
5. Intelligibility testing shall be per IEC 60849 and verified and tested by a third-party testing organization.
6. Central station notification: Verify that one set of conductors in the terminal cabinet becomes a short circuit on any "trouble" condition and that the other set becomes a short circuit on any "alarm" condition. Verify that the conductor groups are labeled properly.

C. Contractor shall replace at no costs to the Owner all devices which are found defective or do not operate within factory specified tolerances.

**FIRE ALARM SYSTEM
SECTION 26 6116
3595001000**

END OF SECTION

PART 1 - GENERAL REQUIREMENTS

1.1 OVERVIEW

- A. Copper cabling will be Panduit with a 25 year Pan-Net warranty.
 - 1. At project completion, the contractor shall present to owner a single project binder with electronic and hard copies of test results, as built drawings, pictures, bill of materials listing part numbers, etc. and a Visio 2007 drawing electronic provided to owner's Information Services and Educational Technology (ISET) office which identifies all Data jack locations and port assigned numbers.
- B. The installing contractor shall furnish and install all hardware, cables, devices, and other materials even though not specifically mentioned herein, which are necessary for the proper integration of the system so that the system shall perform the functions listed herein in compliance with all specified requirements.
- C. A Contractor may use up to ONE sub-contractor to install all CAT6 data cabling. Contractor will provide 'As Builts' and warranty information to ISET department.
 - 1. The contractor shall have a minimum of five years professional field experience pulling/terminating fiber and Cat6 cable.
 - 2. The contractor shall possess a valid C-7 California State contractor's license. This license shall have been issued two (2) years prior to the date of the bid. No other license classification is acceptable.
 - 3. The contractor and/or sub-contractors shall have Panduit Certified Installers as well as Corning Certified NPI Installers.
- D. The contractor and/or sub-contractors shall have at least half BICSI installers and one RCDD who will work on the project.
 - 1. The contractor shall provide a twenty-five (25) year application performance warranty for all Panduit Pan-Net copper cable and connectivity products. The system shall be installed to meet all TIA/EIA commercial building wiring standards and installed per appropriate Panduit instruction sheets. If any Panduit product fails to perform as stated above, Panduit will provide new components at no charge.

1.2 ABBREVIATIONS

- A. A.P. - Wireless Access Point
- B. AFF - Above the finished floor
- C. BKBRD - Backboard
- D. E.F. - Entrance Facility (formerly called MPOE or MPOP)

DATA COMMUNICATIONS
SECTION 27 1000
3595001000

- E. E.R. - Equipment Room. A building/campus serving facility connecting backbone to horizontal cabling and housing the building/campus' core system equipment.
- F. IDF – Intermediate Distribution Facility
- G. ISP - Inside Plant
- H. MAC - Moves, Adds, and Changes
- I. MDF – Main Distribution Facility
- J. MM - Multimode fiber
- K. NEXT - Near End Crosstalk
- L. OSP - Outside Plant
- M. SM - Single mode fiber
- N. T.R./T.E. - Telecommunications Room/Enclosure. A floor serving facility connecting backbone and E.R. to horizontal cabling in a region on each floor.
- O. TBB - Telecommunications Bonding Backbone
- P. TGB - Telecommunications Ground Buss Bar
- Q. TMGB - Telecommunications Main Ground Buss Bar
- R. U.O.N. - Unless otherwise noted

1.3 RELATED DOCUMENTS

- A. In addition to these specifications, the contractor shall reference the following drawings and documents:
 - 1. Architectural / Engineer drawings
 - 2. Detail Visio 2007 As Built Drawings and Diagrams.
 - 3. Any addendum, hereafter release of specifications
 - 4. Panduit Pan-Net 25 year Warranty
- B. Contractor shall ensure that, manufacture, ANSI/TIA/EIA-586-B cable testing, and install of the telecommunications cabling network is per manufacturer's requirements and in accordance with NFPA-70 (National Electrical Code®), state codes, local codes, requirements of authorities having jurisdiction, and particularly the following standards:
 - 1. ANSI/TIA/EIA-568-B.1 - Commercial Building Telecommunications Cabling Standard, Part 1: General Requirements
 - 2. ANSI/TIA/EIA-568-B.2 - Commercial Building Telecommunications Cabling Standard, Part 2: Balanced Twisted Pair Cabling Components
 - 3. ANSI/TIA/EIA-568-B.3 - Optical Fiber Cabling Components Standard

4. ANSI/TIA/EIA-569-A - Commercial Building Standard for Telecommunications Pathways and Spaces
 5. ANSI/TIA/EIA-606(A) - The Administration Standard for the Telecommunications Infrastructure of Commercial Buildings
 6. ANSI/TIA/EIA-607(A) - Commercial Building Grounding and Bonding Requirements for Telecommunications
 7. ANSI/TIA/EIA-758(A) Customer-Owned Outside Plant Telecommunications Cabling Standard
 8. ISO/IEC 11801:2002 ed 2- International standard for Class F (Cat7)
 9. IEC 61076-3-104:2002- International standard for RJ quad jack
 10. ISO/IEC CD14165-114 - International standard for duplex gigabit on two pair Ethernet
 11. TIA TSB 155 - 10G Ethernet over existing Cat6 up to 50 meters
 12. ANSI/TIA/EIA 565.B.2,10 - Standard for Cat6
 13. Cal/OSHA-Pocket Guide for the Construction Industry (recent edition)
- C. Contractor shall install cabling in accordance with the most recent edition of BICSI publications:
1. BICSI - Telecommunications Distribution Methods Manual (TDMM)
 2. BICSI - Cabling Installation Manual
 3. BICSI - Customer-Owned Outside Plant Design Manual
- D. Federal, state, and local codes, rules, regulations, and ordinances governing the work, are as fully part of the specifications as if herein repeated or hereto attached. If the contractor shall note items in the drawings or the specifications, construction of which would be code violations, promptly call them to the attention of the owner's representative in writing. Where the requirements of other sections of the specifications are more stringent than applicable codes, rules, regulations, and ordinances, the specifications shall apply.

1.4 PRE-INSTALLATION MEETING

- A. Schedule a meeting a minimum of five calendar days prior to beginning work.
- B. Agenda: Clarify questions related to work to be performed, scheduling, coordination, labeling for data jacks, data jack layout on telco racks in MDF and IDFs, etc.
- C. Attendance: Communications systems installer, general contractor, architects representatives, and other parties affected by work.
- D. A copy of manufacturer warranty application shall be provided at this meeting.

1.5 WARRANTY

- A. The project shall be pre-registered with manufacturer before installation has begun.
- B. The installation will have to pass scan tests by a certified contractor.

DATA COMMUNICATIONS
SECTION 27 1000
3595001000

- C. The installation will have to be documented with labels and drawings.
- D. A 25-year PAN-NET manufacturer warranty covering all components, equipment and workmanship shall be passed through in writing with system documentation. The warranty period shall begin on the system's first use by the owner.

1.6 APPROVED PARTS LIST

The following is an approved parts list:

Wire Management

Manufacturer	Part Number	Description
Panduit		J-Hooks shall be Panduit
Panduit	WMP1E	2U Horizontal Wire management
Panduit	WMPSE	1U Horizontal Wire Management
Panduit	CLT100F-C3	1" Split Loom Tubing Orange
Panduit	CLT188F-X3	1.88" Split Loom Tubing Orange
		1" Fiber Innerduct
		2" Fiber Innerduct
Panduit	CWF400N	4" Conduit Waterfalls
Panduit	CCMKIT1	Cable Management Kit
Panduit	WMPVHC45E	Vertical Cable Manager Front & Rear
Panduit	NCMH2	2U Horizontal Cable Manager Front & Rear
Trilobular		Taptite II thread

Twisted Pair Products

Manufacturer	Part Number	Description
Panduit	PUR6004BU-U	Cat 6 Riser Blue
Panduit	PUR6004WH-U	Cat 6 Riser White
Panduit	PUR6004OR-U	Cat 6 Riser Orange
Panduit	PUR6004RD-U	Cat 6 Riser Red
Panduit	PUR6004YL-U	Cat 6 Riser Yellow
Panduit	PUR6004VL-U	Cat 6 Riser Violet
Panduit	PUP6004BU-U	Cat6 Plenum Blue
Panduit	PUP6004WH-U	Cat6 Plenum White
Panduit	PUP6004OR-U	Cat6 Plenum Orange
Panduit	PUP6004RD-U	Cat6 Plenum Red
Panduit	PUP6004YL-U	Cat6 Plenum Yellow
Panduit	PUP6004VL-U	Cat6 Plenum Violet
General Cable	7136100	Outside Plant Cat 6
Panduit	CFPE1WHY	1 Port White Faceplate
Panduit	CFPE2WHY	2 Port White Faceplate
Panduit	CFPE4WHY	4 Port White Faceplate
Panduit	CFPE6WHY	6 Port White Faceplate
Panduit	CFP2SY	Stainless Steel 2 Port Faceplate
Panduit	CJ688TGWH	Cat 6 Jack White
Panduit	CJ688TGOR	Cat 6 Jack Orange
Panduit	CJ699TGYL	Cat 6 Jack Yellow
Panduit	CJ688TGBL	Cat 6 Jack Blue
Panduit	CJ688TGVV	Cat 6 Jack Violet
Panduit	CJ688TGRD	Cat 6 Jack Red

DATA COMMUNICATIONS
SECTION 27 1000
3595001000

Panduit	CPPL24WBLY	Blank, Minicom, 24 port patch panel
Panduit	CPPL48WBLY	Blank, Minicom, 48 Port Patch Panel
Panduit	SRBWCY	Strain Relief for Patch Panel
Panduit	PSL-DCJB	Black out Module Red (Need White, Red Listed)
Panduit	PSL-DCJB-IW	Black out Module White
Panduit	PSL-DCJB	Black out Module
Panduit	C4PPLK	Replacement Label Kit
Panduit	UTPSP3RD	3 Foot Cat 6 Red Patch Cord
Panduit	UTPSP5RD	5 Foot Cat 6 Red Patch Cord
Panduit	UTPSP3OR	3 Foot Cat 6 Orange Patch Cord
Panduit	UTPSP6OR	5 Foot Cat 6 Orange Patch Cord

Raceway

<u>Manufacturer</u>	<u>Part Number</u>	<u>Description</u>
Panduit	LD3WH6-A	LD3 Raceway (Substitute 6 with 8 and 10, for Longer Lengths)
Panduit	LD5WH6-A	LD5 Raceway (Substitute 6 with 8 and 10, for Longer Lengths)
Panduit	LD10WH6-A	LD10 Raceway (Substitute 6 with 8 and 10, for Longer Lengths)
Panduit	CFXWH-E	Raceway Coupler (Replace 'X' with 3, 5, or 10 for the different size raceway)
Panduit	RAFXWH-E	Right Angle Fitting (Replace 'X' with 3, 5, or 10 for the different size raceway)
Panduit	ICFXWH-E	Inside Corner Fitting (Replace 'X' with 3, 5, or 10 for the different size raceway)
Panduit	OCFXWH-E	Outside Corner Fitting (Replace 'X' with 3, 5, or 10 for the different size raceway)
Panduit	DCFXWH-E	Drop Ceiling Fitting (Replace 'X' with 3, 5, or 10 for the different size raceway)
Panduit	JBX3510WH-A	Single Gang Outlet for LD Raceway

Tools

<u>Manufacturer</u>	<u>Part Number</u>	<u>Description</u>
Panduit	CGJT	
Panduit	EGJT	
Panduit	CWST	
Panduit	CJAST	
Panduit	TTS-20R0	Tak Tape Rolls
Panduit	HLS-75R0	Bulk Velcro

DATA COMMUNICATIONS
SECTION 27 1000
3595001000

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. The acceptable manufacturer for the cabling connectivity is Panduit/General copper or Panduit/Panduit copper.
- B. Part listed are the owner's standards and any substitutions shall be approved in writing through submittal.
- C. Panduit 25 year Pan-Net.
- D. Corning Cable

2.2 QUANTITIES

- A. Distances mentioned and shown on drawings or spreadsheets are approximate. Field verification shall be made prior to install.
- B. Quantities listed here and in "parts list" document take precedence over drawing quantities.

2.3 SYSTEM COMPONENTS

- A. Materials provided shall meet or exceed the standards/description listed below.
- B. Fiber Trunk Cable
 - 1. Corning 12 strand single mode outdoor riser fiber optic cable
- C. Horizontal Cable (Cat6):
 - 1. Solid copper, 24 AWG, 100 balanced twisted-pair (UTP) Category 6 cables with four individually twisted-pairs, which meet or exceed the mechanical and transmission performance specifications in ANSI/TIA/EIA-568-B.2 to 250 MHz. General Cables Genspeed 6000 Enhanced CAT6E meets the specification.
 - 2. Use plenum rated cable in PLENUM air environments only.
 - 3. Use gel-filled or other outdoor plant cables in OSP environments as under slab concrete, outside near water, etc.
- D. Connectors (Cat6):
 - 1. 8-pin modular, category 6, pinned to T5689B standard.
- E. Faceplates:
 - 1. Provide 1, 2, 4 or 6 port faceplates and use classic style with label window. Fill unused ports with blank inserts.
- F. Patch Frames:

1. Data frame is to be 19" rack mountable, 24 or 48 empty ports for 8-pin modular jacks. Panels shall include a window for labels. Note: unused ports are to be filled in with black blank inserts.

G. Wire management:

1. On racks the horizontal cable managers shall be Panduit center mounting brackets (WMPF1E) for the wire managers in front for easy access during MACs. Horizontal managers shall be a minimum 1 RU.
2. Vertical cable managers (WMPVHC45E) are to be same height as rack. With fingers in the rear and in the front. They shall to have a bend radius control or strain relief clips. Panduit vertical managers are to be used for extra capacity.
3. Cable runway shall be ladder style or mesh /solid cable tray with a 12" width and 4" depth. The runway shall be mounted to a support loading wall as well as supported to the rack. An angle transition shall be used for adjoining runways or 90 degree bends. A cable drop shall be used to protect cables transitioning from runway to point of termination. If using a ladder style, use cable fingers attached to the sides to prevent spilling of cable over the sides.

H. Cable Pathways:

1. J-hooks will be used for suspending cables. These hooks shall have a 50 cable capacity and optional mounting. Preferred hooks have a wheel attachment capability so cables will not be dragged across during installation. Ensure that bends and edges will not pinch or cut cable sheath. Provide enough J-hooks to keep pathway along walls, J-hooks shall not cross the room.
2. Penetrations through fire rated walls shall utilize a metallic assembly with fire stop built into the assembly. EZ Path mechanical fire stop by Specified Technologies meets this requirement and shall be used. There is no exception to this.

I. Miscellaneous:

1. Cable ties shall be Velcro with a loop strap. Nylon cable ties shall not be used. If they are they shall be black and strapped with a loose tie so as not to pinch the cable sheath and with enough slack to get snips and fingers between tie and cable. The end of the tie shall be cut off after strapping.
2. Labels for patch panels, faceplates, and cables shall be by one manufacturer. Ex: Label Ware, EasyMark, Brady, LabelMo, etc.
3. All conduits shall have a maximum fill ratio of 60%.
4. All labels including the cable label shall be laser printed.
5. Labeling (Wire and Wall Jacks): All Labeling shall follow the "Tracy U.S.D. Labeling Format" (See "Tracy U.S.D. Labeling Format" Spreadsheet) with exception of workstation cables (i.e. patch cords). Hand written labels are not acceptable. All labels shall be machine printed black lettering on opaque white tape, stenciled onto adhesive labels, or type written onto adhesive labels. The font shall be at least one-eighth inch (1/8") in height, block characters, and legible. Patch panels shall be assembled and terminated in a sequential order, exhibiting room and workstation numbers for all workstations served by the MDF or IDF.

DATA COMMUNICATIONS
SECTION 27 1000
3595001000

6. Each fiber optics cable segment shall be labeled at each end with its respective IDF identifier. Each fiber interconnect device shall be labeled with its respective IDF identifier.
7. Each telecommunication outlet shall be labeled with its respective workstation number respective (machine labels only).
8. Workstation Terminal Outlets are to be installed within single-gang or double-gang electrical boxes. No mud-rings are to be used. WAO faceplates are to have labeling which identifies connected IDF.
9. Each copper backbone cable shall be machine labeled and printed EIA/TIA-606 Section 8 compliant only at each end with its respective IDF number/letter. Each binder group shall be tied off with its respective identifying ribbon at each breakout point.
10. Labeling will be completed before testing shall begin; discrepancies during inspection with the labeling will void all test results.

2.4 PROJECTOR

1. Contractor shall furnish and install Epson Brightlink 1485Fi and associated Epson Pilot control pad.

PART 3 - EXECUTION

3.1 SYSTEM SPECIFIC INSTRUCTIONS

A. Horizontal Cable:

1. Contractor shall label cables in 2 locations 12" apart.
2. Contractor is to terminate using the 568B pin out.
3. Contractor is to leave 10 feet of slack for all cables at the station in the accessible ceiling.
4. All cables will terminate at the stations with RJ45 connectors and shall be housed in a faceplate. If the connector is in the ceiling or behind a faceplate (such as the AV control panel) the connector shall be installed in a surface housing.

B. Closet/Rack:

1. All cables will terminate on the rack on a modular patch panel with an RJ45 connector.
2. A horizontal manager shall be installed above and below every 48 ports of patch panels (CPPL48WBLY) and switches.
3. A service coil shall be created above the rack on the wall of the closet. Do not place a service coil within the vertical and horizontal wire management. Cables within those managers shall be kept straight with proper bend radius.
4. The service coil shall be long enough to reach the farthest corner of the room and then down to the floor.
5. Patch frames shall be rack mounted using grounding screws and washers.

6. Note: unused ports on the patch frames are to be filled in with black blank inserts. Also, 1-2 blanks will be installed after each student data, teacher, admin, ceiling, and paging outlet with less than 4 cables to allow for future MACs.
7. Contractor shall place a drawing next to the data rack showing a floor plan with outlet locations and labels that match the rack labels. These drawings are to be laminated or in a plastic casing.

3.2 INSTALLATION PROCEDURES

- A. The following are installation practices that ensure superior performance and aesthetics.
- B. NOTE: References to conduit, raceway and electrical are for contractor's information. Actual installation of these components is included in another specification. If contractor notices a difference between actual install and the specs below, the contractor shall bring that immediately to the attention of the electrical engineer.
- C. Work Area Outlet
 1. The 10 ft coil shall not be a traditional service loop. Rather, the cable shall be extended along the wall then brought back at a lower height.
 2. A pull string for MACs shall be pulled with cable into accessible ceiling space or length of conduit. *Label strings to indicate destination of conduit.*
 3. Fill and label faceplates starting in the top left then moving right and downward.
 4. In addition to labeling, jacks shall be quickly identifiable by the following color:
 - a. Paging Jack Blue
 5. All jacks are to be terminated using 568B pin assignment.
 6. Minimize the amount of untwisting in a pair as a result of termination to connecting hardware. The amount of twisting shall not exceed 1/2" for category 6 and higher cables. Cable sheath shall touch the back of jack after termination (leave no portion of the cable exposed).
 7. A classic series faceplate (or surface mount box if needed) with a label window shall be used or the Jack itself labeled (Easy Mark #PLL-46-Y3C-1 or equal).
 8. The cable behind the faceplate shall also be labeled to match faceplate.
 9. ALL labels are to be machine generated, laminated, and adhesive.
 10. Each faceplate shall be labeled with its respective workstation number.
- D. Cable Pathways
 1. Acceptable Pathways:
 - a. All horizontal cable shall have support, the cable shall never be lain freely and resting on structural supports nor shall they use ceiling grid or lighting support wires.
 - b. The pathway to the work area shall allow for a minimum of 3 cable runs per individual work area.
 - c. Pathways shall ensure that a maximum pulling tension 25 lb-f is not exceeded and pathways (or installers) shall not deform the cable jacket. *If cable becomes kinked, contractor shall replace the cable.*

DATA COMMUNICATIONS
SECTION 27 1000
3595001000

- d. Acceptable pathways are: cable tray, j-hooks, conduit, and surface mount raceway. No floor mounted boxes.
- 2. J-hooks - responsibility of cable installer
 - a. Cables shall not be attached to ceiling grid or lighting support wires. Instead cable pathway shall be along walls. Cables shall never cross a room. The pathway shall always be along a wall. This makes for easier MAC as any tile next to a wall can be moved to access.
 - b. For large quantities of cables (50 to 75) that converge at the TR and other areas, provide cables trays that are specifically designed to support the required cable weight and volume. When more than 50 cables are in a pathway j-hooks shall not be used or a second pathway shall be created. (NOTE: It is recommended that no more than 25 UTP Cat6 cables be placed in a single J-hook).
 - c. If cable tray is used follow manufacturer guidelines for installation and use a product that is designed specifically for communications cabling. The depth of the tray shall not exceed 4".
 - d. When using J-hooks, locate them staggered between 4 ft to 5 ft to adequately support and distribute the cable's weight. Do not evenly space the hooks, vary between 4 to 5 feet between each hook to prevent signal disruption.
 - e. When using J-hooks install cable with a wheel pulley system that will remove after cable is in place.
 - f. Contractor shall not strap the cables in between hooks to enable easier MACs and to lessen possibility of alien crosstalk.
- 3. Conduit
 - a. When pulling through conduit, cable pulling lubricants shall be continuously applied to all cables and be specifically approved by the cable manufacturer.
 - b. Pull string shall be installed in conduit to allow future MACs. If more than one string is installed in a conduit, the strings shall be labeled for identification of destination.
 - c. Conduits shall have grommets on end to protect the cable.
 - d. No more than (2) 90 degree turns in a given length
- 4. Fill capacities
 - a. Cable pathways shall not be filled greater than the NEC maximum fill for the particular pathway type.
 - b. The fill cable capacity for conduit shall not exceed the following and be no more than 60% full:
 - 1) 1/2 " 0 – Do not use
 - 2) 3/4 " 0 – Do not use
 - 3) 1" 4 – Do not use
 - 4) 1 1/4 " 6
 - 5) 1 1/2" 8
 - 6) 2 " 12
 - 7) 2 1/2 " 16

- 8) 3 " 24
- c. Fill capacity for raceway: (See Manufacturer Specs and Size by Cat6 requirements or 8.4mm/.33in diameter cable)
- 5. Distance Limitations
 - a. Horizontal cable distance (Outlet to Panel) is not to exceed 298 feet.
 - b. Premise cable distance (Outlet to Panel) shall be no less than 55 ft for any cable installed. Coil excess in ceiling if physically closer than 55 ft.
- 6. Aerial cable shall not be utilized.
- E. Bend Radius Limits
 - 1. The minimum bend radius for copper cable 4x cable diameter which is approximately 1.24 inches (31 mm).
 - 2. The minimum bend radius for indoor (ISP) backbone optical fiber when under no load is 10 times the cable diameter and while it is being pulled it is 15 times.
- F. EMI Avoidance
 - 1. Cabling shall be installed to avoid devices that cause electromagnetic interference, such as Microwaves, Refrigerators, lighting, ballasts, power panels, etc.
 - 2. Keep a minimum of 6" from electrical conductor cable.
 - 3. Telecommunications conductors shall not be routed closer than 6 ft. from any lightning protection system conductor.
- G. Cabinets and Racks
 - 1. Only black Velcro cable ties shall be used for bundling and routing. Bundles shall be loose and Velcro ties shall have at least 18 inches between and the bundle shall be loose enough to place two fingers between the cable and the ties.
 - 2. The service coil at the rack shall be located above the rack on the ladder rack/cable tray system or on the wall. Do not place the service coil within the vertical and horizontal wire management.
 - 3. Entrances to cabinets shall be protected with grommets and shall have a conduit stubbed to ceiling space.
 - 4. Installer shall create a detailed floor drawing designating jack locations and labels. A copy shall be attached inside the cabinet or back wall of the rack. The drawing shall also have the date and contractors contact information.
 - 5. Installer shall ensure that every telco rack/cabinet shall have separate and individual patch panels for workstation data cabling for each classroom, office or room space. In-addition, separate and individual patch panels shall be installed for each individual system such as: Extron A/V, Valcom IP Paging, Security Surveillance, and Wireless Access Point devices.
- H. Wire Management
 - 1. When bringing cable into the data rack, keep the bundle size small (optimum size may be 12 cables no more than 24 cables).

DATA COMMUNICATIONS
SECTION 27 1000
3595001000

2. Velcro Ties shall be used in place of cable ties. Do not cinch cables so tightly to deform the cable in any way. It is recommended to leave Velcro ties loose enough to get fingers in between without deforming cable. Velcro ties shall be placed no less than 18 inches from other Velcro straps.
3. Every 48 ports of patch frame shall have its own wire manager below and above (except angled patch frames). The manager shall be d-rings on the front for easy access for MACs. Rear management shall also be used and may be finger style or bar style.
4. In addition to the horizontal managers, the installer shall either install a vertical (WMPVHC45E) Panduit center mounting brackets for the wire managers for vertical management.
5. In addition to binding in Velcro ties, ring runs shall be used for cables run in corners and for drop and rise on walls. These bundles shall be labeled indicating the destination of the bundle (i.e. floor horizontal cables, to TR2, etc.).
6. When cable bundles transition from wall to a floor rack a cable tray or ladder rack shall be utilized. Install brackets on sides to prevent cables from falling off the rack if ladder rack is used.

I. Fire stopping

1. All procedures in this category shall be done in accordance with authority having jurisdiction (AHJ), local codes, CEC, and insurance underwriter's requirements. If a procedure in one of these effects performance, the AHJ shall be alerted immediately in writing.
2. Ensure that materials used are U.L. Listed.
3. For sleeves through ALL walls, EZ Path by Specified Technologies shall be used to ensure a fire stopped pathway on future MAC.
4. Contractor shall put a label per ANSL11A/EIA 569 with warning to not remove, company name and phone number, and date next to each penetration. Contractor shall also place a label stating how many cables can fit within the EZ Path. If initial install fills the firestop, the label shall read "Capacity full — DO NOT ADD CABLES". Do this labeling and take a picture to include in close out docs. Cabling will not exceed 60% fill.
5. If the firestop capacity is filled more than 85% during initial install, contractor shall install an additional EZ Path.

J. Grounding and Bonding

1. All network equipment, shielded cables, patch panels, racks, and tray/ladder rack segments shall be Bonded and Grounded according to TJNEIA 607, BICSI guidelines, CEC, insurance underwriter's requirements, and local code (AHJ). The purpose is to provide a path to ground for all components to ensure personal safety and equipment protection.
2. Ensure that materials used are U.L. Listed.
3. Conduits that contain grounding backbone conductors shall be bonded to the grounding conductor at each end of the conduit. This negates the high impedance choke" effect while the cable carries lightning currents.
4. All racks, trays, and electronics shall be grounded.

5. Contractor shall install on rack an ESD Port Kit on each rack in front and back.
6. The use of aluminum conductors is discouraged in the establishment of grounding scenarios. Aluminum does not provide the lowest resistive path. Additionally, aluminum conductors can become loose from mechanical screw/bolt connections due to vibration from carrying AC current.
7. Panduit's Data Center Grounding Solution and components shall be used. The following components shall be used to form a complete system (see the detailed drawing): Cabinet Grounding Complete Kit, Common Bonding Network Jumper (CBN) Kit, Surge Suppressor Jumper Kit, Front to Back Rail Jumper Kit, Rack Ground Strip Kit, Grounding Bus bar Kit, Paint Piercing Grounding Washers Kit, Thread Forming Screws, and Electrostatic Discharge (ESD) Discharge Port Kit.
8. Contractor shall test the ground system to ensure it has less than 5 Ohms. The test results shall be documented and submitted in close out docs.
9. Documentation: Contractor shall provide a single set of documentation to include test results and Visio "As-built" drawings in both soft copy and hard copy format.
 - a. Workstation Cable: The results of the workstation cable tests shall be provided in the form of printouts from the test equipment as well as computer file copies on CD with the software to read the results included. Test results shall be in PDF format.
 - b. As-Built Drawings: Contractor shall produce drawings depicting data outlet locations as they are actually installed. The drawings shall indicate actual cable routing, work station locations and workstation numbers, to be submitted before final inspection for punch list. Incorrect Visio drawings are punch list items and are to be corrected before re-inspection. "Tracy Unified School District's Telecommunications Jack Legend" shall be applied to all drawings. Results shall be returned to ISET within 30 days.

3.3 TESTING

- A. Testing shall be done with a Fluke Level IV cable tester (DTX 1800 meets this specification) and an Optical Time-Domain Reflectometer (OTDR). The new Fluke DTX 1800 unit is one test set that is capable of testing all frequencies through 900 MHz. If another manufacturer provides this test, contractor shall submit spec sheets and receive written approval for the tester prior to testing.
- B. Contractor shall ensure that the tester has been manufacturer calibrated within nine months of testing and has the latest software version downloaded.
- C. Prior to testing, the tester shall be set for the specific cable and jack used on the project.
- D. A summary test report shall be submitted as well as detailed reports for each cable.
- E. All test results shall have the individual cable label and project name in the header along with the date and time of testing.
- F. Test results shall clearly indicate a Pass or Fail on the report. If a cable fails in one parameter the test is considered a Fail. Marginal Pass cables (indicated with an asterisk) are not acceptable and will be considered as a Fail.

DATA COMMUNICATIONS
SECTION 27 1000
3595001000

- G. Any cable damaged or exceeding recommended installation parameters during installation shall be replaced by the contractor prior to final acceptance at no cost to the Owner.
- H. Test reports shall show a pass result for network standards, continuity, length, cross-talk, attenuation, and ambient noise.
- I. No Splices will be accepted.
- J. An optical time domain reflectometer (OTDR) test will be required on the existing fiber pathways prior to the work commencing and on conclusion of the work. District IT will provide final acceptance of the OTDR test results and sufficiency.

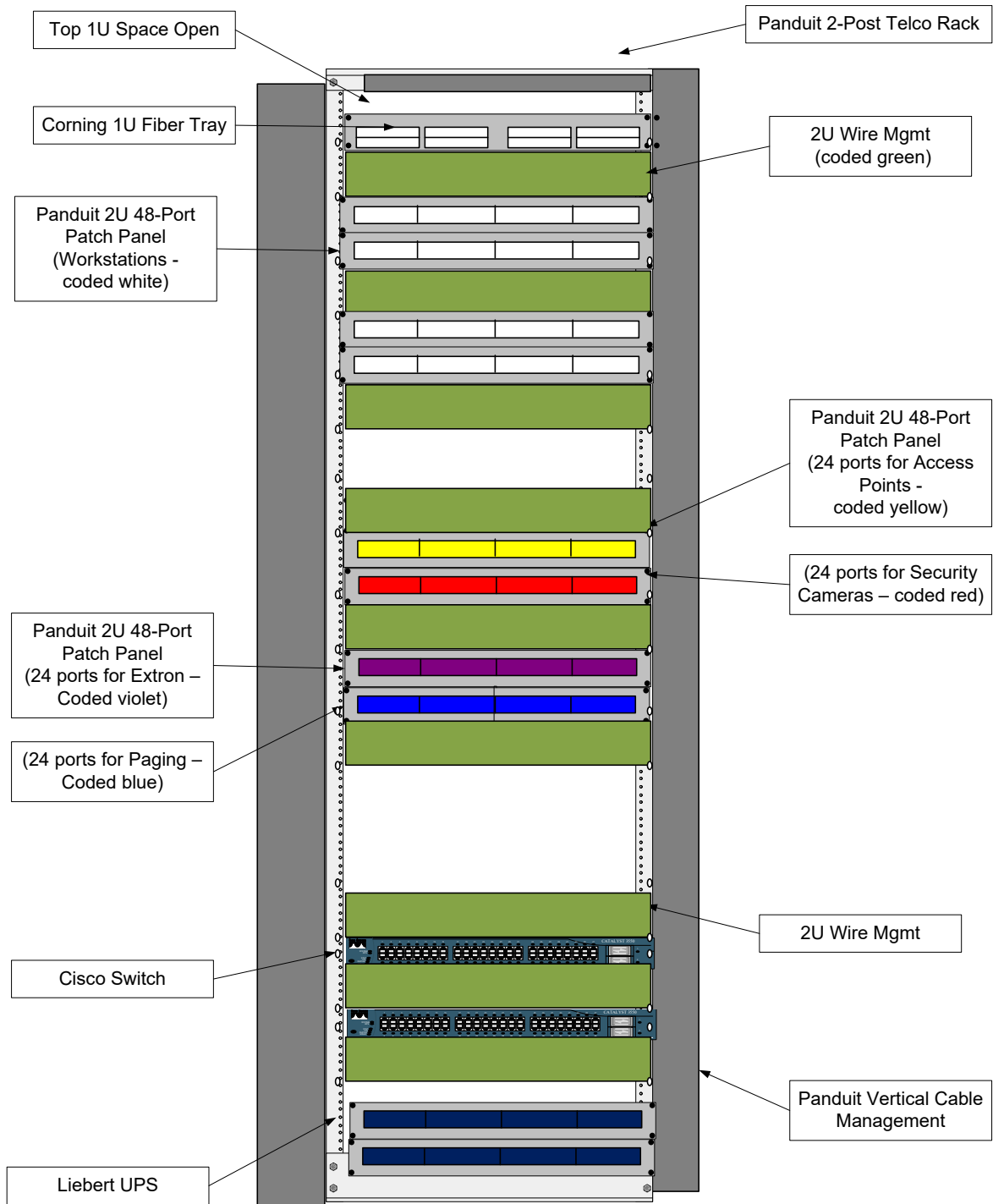
3.4 EXAMINATION /FIELD QUALITY CONTROL

- A. On a daily basis, the contractor's project manager shall inspect the installation to ensure that installers are following the specifications and quality craftsmanship.
- B. Throughout the project regular interval inspections will be completed by an architect representative to eliminate "unchangeable" installations.
- C. If the representative inspects the site and makes a change to the design or installation, this shall be noted in writing. The contractor shall not complete this change until approval is given.
- D. After installation, the architect representative will first inspect the site and create a closeout punch list for contractor to complete.
- E. After completion, the representative and contractor will inspect the site together.

3.5 IDENTIFICATION

- A. The labels are to be laser printed onto adhesive labels using software and labels by Label Ware, Easy Mark, Brady, LabelMo, etc.
- B. Each cable is to be labeled using the following pattern: XXX-A##
 - 1. Segment XXX: Designates the location where the other end of the cable is. That is, at the station it says what room the patch panel is, and at the patch panel it says what room the station is.
 - 2. Segment A: Designates which patch panel the cable is terminated. This allows 26 patch panels per closet.
 - 3. Segment ##: Designates which port on the patch panel the cable is terminated.
- C. Segment A and ## shall be the same on both sides of the cable.
- D. Contractor is to place labels onto the faceplates and panels. In addition, contractor shall place an adhesive label on each end of the cable.
- E. Layout of an IDF rack (*not to scale*). Rack height shall be 72".

**DATA COMMUNICATIONS
SECTION 27 1000
3595001000**



F. Labeling Format

1. All data cables at both the patch panel and the data jacks shall be labeled using the following standard labeling format. The labels are to be laser printed onto

DATA COMMUNICATIONS
SECTION 27 1000
3595001000

adhesive labels using software and labels by Label Ware, Easy Mark, Brady, LabelMo, etc.

2. Telecommunication outlets for a Valcom IP Paging horn, speaker or clock/speaker shall be labeled with its respective Valcom IP device number (machine labels only). Valcom numbers shall be comprised of the room number (i.e. C1, C2, etc.) and Valcom IP device number/drop number (i.e. PA1, PA2, etc.). Each data cable at a telecommunications outlet shall have an alpha identifier for the data jack (i.e. A). No biscuit shall be used and the data jack should be placed inside the Valcom back box. The labeling will start from the main door entering the room and go clockwise around the room. Each workstation cable shall be neatly labeled at each end with its respective workstation number.
3. Labeling for the respective port on the MDF/IDF patch panel shall be:
 - a. C1 – PA1 – A

3.6 CLEANING

- A. All work shall be cleaned to remove all dust, dirt, grease, paint or other marks. All electrical equipment shall be left in a clean condition inside and out, satisfactory to the owner. Keep buildings and premises free from accumulated waste materials, rubbish and debris resulting from work herein, and upon completion of said work, remove tools, appliances, surplus materials, waste materials, rubbish debris, and accessory items used in or resulting from work and legally disposed of offsite. For lead and asbestos dust removal, refer to "Safe School Standards" documentation.

3.7 CLOSEOUT

- A. The contractor will submit to owner within thirty days of completion a closeout package containing:
 1. Hard copy and electronic test results.
 2. Hard copy and electronic as-built drawings with labels (with extra copies to be posted in the E.R. and T.E.s).
 3. Warranty information and manuals.
 4. A bill of materials with part numbers to be used for later MAC.
 5. Hard copy and electronic pictures.
- B. As prerequisite to final acceptance, supply to the owner certificates of inspection from IOR and owner designated RCDD.

- END OF SECTION -

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. Furnish and install new IP devices into existing IP Sound/Communications System with clock subsystem, including all wiring and connections and other materials as shown on Plans and specified herein. It is the intent that complete operating systems be installed and that any power supplies, transformers, modules, cards, cages, programming, or other items required to achieve this end result shall be furnished whether or not such item or items are specified herein.
- B. IP School Application VoIP equipment supplied by Valcom, Inc. shall be considered as meeting all specification requirements and the District's standards.
- C. The system shall provide distribution of intercom, overhead paging, emergency paging, class change time tones and emergency tones.
- D. System shall be UL 813 and FCC Part 15 listed for safety reasons. Systems not listed are not acceptable.
- E. Site and System Investigation: Sound/Communications System bidder shall visit site prior to bid and become thoroughly knowledgeable about existing system and work required to perform work of this section. Failure to discover the equipment, materials, and labor required to complete the extensions will not relieve the contractor from completing the work at no additional cost.

1.2 GENERAL REQUIREMENTS

- A. System Requirements: All of various equipment components to be complete with all appurtenant accessories required to provide specified facilities and perform specified functions throughout presently planned construction and space; and provisions for expanding system to provide same facilities, and perform same functions in all future planned construction, including space and mountings in consoles and terminal backboards.
- B. Equipment Tests and Standards:
 - 1. For all equipment operating at 26 volts or more, or utilizing over 50 watts, Contractor to submit proof within time allowed for submittals that all items of equipment will conform to requirements of U.L. Label or listing of equipment by U.L. to be accepted as evidence of conformance.
 - 2. For all items of equipment operating at 25 volts or less, and utilizing less than 50 watts, Contractor may submit, in lieu of such label or listing, written certificate from any nationally recognized testing agency, adequately equipped and competent to perform such services, that each item has been tested and conforms to U.L. standards, including method of test of U.L.
- C. Instructions and Manuals:

SOUND AND COMMUNICATIONS

SECTION 27 5123

3595001000

1. Equipment supplier of systems to demonstrate operation of systems to satisfaction of Owner and furnish Owner three (3) wiring schematics and a list of MAC addresses for all items of equipment, installation instructions, and details of all routine maintenance and servicing which must be given systems by Owner. Manuals shall be provided in 3-ring binders, with title page, list of contents, and conspicuous label on cover and shall be delivered to District. Submit copy to Architect for approval before delivering to Owner.
2. Supplier shall demonstrate operation of systems and provide training to all end users, administrative staff, and system administrator. Coordinate times of instruction with District, at District's convenience. Supplier shall provide a minimum of 2 hours of user instructions to clerical staff and 4 hours of user/maintenance instructions to District maintenance personnel. Instruction periods shall not coincide and shall be scheduled with District, not school staff. District shall provide list of authorized personnel for training sessions.

D. Submittals:

1. Refer to Section 27 1000.
2. Contractor shall submit name of firms he proposes to do work under this Section, addresses, phone numbers, and name of firm's contact, for approval. Such firms shall be factory authorized representatives of the existing system and submittal shall include manufacturer's letter of confirmation. Proposed firm shall furnish all equipment and specialty cables, make all connections to same, and place the systems in operation. Such firms shall have offices and service departments within a 100 mile radius of project and shall have been in business of this type for at least five years.

E. Record Drawings:

1. Final Inspection will not be made until drawings are received and approved. Record Drawings shall include "As-Built" one-line and wiring diagrams, with terminations identified, wire color coding schedule, pullbox locations, and conduit routing plans.
2. The Contractor shall provide complete drawings detailing all interconnections and panel wiring diagrams in Visio 2000 format.

F. Guarantee:

1. One firm to assume full responsibility for performance on all work of this section. Guarantee all equipment against defects in material and workmanship for two (2) years, and provide on-the-premises service during normal working hours for two years, at no cost to Owner if trouble is not caused by misuse, abuse, or accident, or at current labor rates if so caused. Provide manufacturer's written one-year guarantee for equipment and parts to Owner.
2. Service shall normally be available within 24 hours from service department of authorized distributor of manufacturer by factory trained servicemen.
3. On-the-premises service at other than normal working hours to also be available, but labor charges for such calls to be paid by Owner at current labor rates.

PART 2 - DETAIL REQUIREMENTS AND PRODUCTS

2.1 SOUND/COMMUNICATIONS SYSTEM

- A. General: Install new IP devices into existing IP Intercommunications System.
- B. Exceptions to these specifications are not acceptable. Substitutions are not permitted.
- C. Verify existing server is provided and programmed. Server shall be Valcom VE6025, or similar.
- D. Provide station ports as required – Valcom VE8012BR.
- E. Equipment Standards:
 - 1. All enclosures for all equipment to be of metal throughout system. Enclosures other than metal are not acceptable.
 - 2. Speaker grilles to be non-directional diffusion type insulated from speaker by fiber mounting board. Dampening material to be installed between mounting board and grille to prevent metallic resonance.

2.2 SYSTEM CABLING

- 1. Each clock/speaker and speaker shall have a Category-6 cable homerun from the local data rack. The cable shall be terminated on a jack or directly wired to the device within the provided enclosure.
- 2. Electronics contractor completing this specification shall provide the patch cord for connecting the speaker to the jack. Contractor shall provide a 1 foot (or shorter) blue patch cable.
- 3. Refer to Section 27 1000 for wiring requirements.

2.3 REMOTE EQUIPMENT

- A. Combination Clock/Speaker: Valcom VE4031A-A with VB-R19 recess mounting backbox.

PART 3 - EXECUTION

3.1 INSTALLATION REQUIREMENTS

- A. Electrical Contractor shall retain the services of the duly appointed representative as specified hereinbefore, who shall furnish all equipment, make all connections to same, and place system in operation. Technician and workman employed shall be particularly skilled in this type of work. Workmanship on installed systems shall be of professional quality, best commercial practice.
- B. All wiring throughout entire system shall be installed in conformance with standard industry practice.

SOUND AND COMMUNICATIONS
SECTION 27 5123
3595001000

- C. Station locations shall be identified by location and school's actual room numbers as furnished by District, and in all ways shall relate as closely as possible to record wiring drawings. Prior to performing final labeling and programming, coordinate information with District.

3.2 CONSTRUCTION MEETINGS

- A. The Contractor shall schedule construction meetings at the jobsite as follows:
 - 1. Prewire meeting shall occur after raceways are installed and prior to pulling of any wire or cable.
 - 2. Pre-termination meeting shall occur after wire and cable has been installed and prior to termination.
- B. Meetings shall be scheduled by the Contractor on a building by building basis and shall include the Project Inspector, School's Representative, the electrical subcontractor, and the Signal System subcontractor as a minimum.

3.3 TESTS

- A. After all equipment specified herein has been installed and is in operating condition, performance tests shall be conducted to determine that installation and components comply with these specifications. Contractor shall furnish competent personnel for these tests.
- B. Perform initial programming of system and audio level adjustments.
- C. Contractor shall physically walk to each speaker and ensure that sound is coming from each speaker.
- D. Contractor shall set the volume level to approximately 6 dB above ambient noise during occupancy.
- E. The sound level for each speaker and zone shall be tested with an audio meter.
- F. Contractor shall provide a drawing showing dB levels for each speaker and zone. The drawing shall be dated and signed by the person administering the test.
- G. Contractor shall test the extension for each room. Extension also be noted on the drawings.
- H. Testing shall be scheduled with the Owner and shall occur after receipt by Architect of Contractor's written certification of completion, record one-line diagram, wiring diagrams, maintenance and operation manuals, and other "As-Built" data required by these specifications. Tests shall be scheduled with School before occupancy occurs.

- END OF SECTION -

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. Furnish and install extensions to the existing Intrusion Alarm System including all wiring and connections and other materials as shown on Plans and specified herein. It is the intent that a complete operating system be installed and that any power supplies, relays, resistors, cards, modules, programming, or other items required to achieve this end result shall be furnished whether or not such item or items are specified herein.
- B. Site and System Investigation: System bidder shall visit site prior to bid and become thoroughly knowledgeable about existing system and work required to perform work of this section. Failure to discover the equipment, materials, and labor required to complete the extensions will not relieve the contractor from completing the work at no additional cost.
- C. Proprietary Systems: Where school is protected and monitored by a proprietary system, such as ADT or Sonitrol, Contractor shall coordinate the exact requirements with those firms. If the Division 16 Contractor elects to use a sound and signal firm other than the proprietary company, the sound and signal firm must include in bid, the materials, equipment, and labor required by the proprietary company to make the extensions complete and fully functional.

1.2 GENERAL REQUIREMENTS

- A. System Requirements: All of various equipment components to be complete with all appurtenant accessories required to provide specified facilities and perform specified functions throughout presently planned construction and space; and provisions for expanding system to provide same facilities, and perform same functions in all future planned construction, including space and mountings in control panels and terminal backboards.
- B. Interruption of Service: Existing intrusion alarm system must be kept operational during unoccupied hours. In the event that the system or portion of system is nonoperational during off-hour periods as a result of work of this contract, the Contractor must provide guard(s) to patrol the campus. Guard(s) and guard duties proposed by Contractor must be acceptable to District and District Police (local enforcement if District does not have its own Police Services). All costs for security guard(s) shall be Contractor's responsibility.

1.3 QUALITY ASSURANCE

- A. Work shall be performed in accordance with all applicable requirements of the edition indicated on the drawings of all governing codes, rules and regulations including but not limited to the following minimum standards, whether statutory or not:
 - 1. California Electric Code (CEC)
 - 2. California Fire Code (CFC)
 - 3. National Fire Alarm Code with California Amendments (NFPA 72)

INTRUSION ALARM SYSTEM
SECTION 28 3100
3595001000

4. Title 3 of the Americans with Disabilities Act
5. Titles 19 and 24 of the California Code of Regulations

1.4 CONTRACTOR QUALIFICATIONS

- A. Fabricator/Installer/Vendor shall be licensed contractor and servicing agent, as well as installer for all components and systems in this System, and be acceptable to manufacturer of the major components of the system. Service personnel shall be capable of serving any and/or all components of the System.
- B. Fabricator/Installer/Vendor must be able to present evidence of technical expertise, be a firm who has successfully installed projects of a similar scope to this project for a minimum of five (5) years, and shall maintain service office within 100 miles of the project site.
- C. All equipment is to be manufactured by a firm/firms who have successfully fabricated elements/systems of a scope similar to this project for a minimum of ten (10) years.
- D. Have a valid State of California Contractor's license in classification C10 - Electrical.
- E. Provide authorized dealer service on-site at facility within four (4) hours of a problem being reported, with this response time available twenty-four (24) hours per day, seven (7) days per week.
- F. Affirm that he maintains, or will maintain, or has access to, a stock of system spares sufficient to ensure that no element of the System will be out of service for more than twenty-four (24) hours due to lack of proper spares.

1.5 SUBMITTALS, O&M'S AND RECORD DRAWINGS

- A. Submittals:
 1. Contractor shall submit name of firm he proposes to do work under this Section, addresses, phone numbers, and name of firm's contact, for approval. Such firms shall be factory authorized representatives of the system and submittal shall include manufacturer's letter of confirmation. Proposed firm shall furnish all equipment and specialty cables, make all connections to same, and place the systems in operation. Such firms shall have offices and service departments within a 100 mile radius of project and shall have been in business of this type for at least five years.
 2. Submittals shall be complete and include catalog data, shop drawings, one-line diagrams, battery calculations, voltage drop calculations, and scaled plan drawings. Building plans shall be 1/8"=1'-0", and site plans shall be no smaller than 1"=40'.
 3. Shop Drawings shall contain complete wiring and schematic diagrams for equipment furnished, equipment layout, conduit and wiring layout drawings, and any other details required to demonstrate that system has been coordinated and will properly function as a unit. Equipment Vendor shall check Drawings for adequacy of conductors and raceways for proposed system. Include in Bid

Amount all required raceways, conductors and material necessary to suit proposed system.

B. Operation and Maintenance Manuals:

1. Operating Instruction Manuals outlining the step-by-step procedures required for system start-up and operations shall be furnished. The instructions shall include manufacturer's name, model number, service manual parts list, and brief description of all equipment and their basic operating features.
2. Maintenance Instruction Manuals outlining maintenance procedures shall be furnished. The manual shall include a troubleshooting guide listing possible breakdowns and repairs and a simplified connection wiring diagram for the system as installed.

C. Record Drawings: Final Inspection will not be made until drawings are received and approved. Record Drawings shall include "As-Built" one-line and wiring diagrams, with terminations identified, wire color coding schedule, pullbox locations, and conduit routing plans.

D. Furnish to District a printed copy of the control panel programming upon completion of final system programming.

E. Performance Test Reports: Upon completion of installed system, submit in booklet form all field tests performed to prove compliance with the specified performance criteria. Each test report shall indicate the final position of controls.

1.6 TRAINING

A. Supplier shall demonstrate operation of systems and provide training to all end users, administrative staff, and system administrator. Coordinate times of instruction with District, at District's convenience. Supplier shall provide a minimum of 1 hour of user instructions to clerical staff and 2 hours of user/maintenance instructions to District maintenance personnel. Instruction periods shall not coincide and shall be scheduled with District, not school staff. Deliver to Owner at time of demonstration, all settings and codes programmed into system. Furnish three copies on manufacturer's standard programming worksheets. District shall provide list of authorized personnel for training sessions.

1.7 GUARANTEE

A. One firm to assume full responsibility for performance on all work of this section. Guarantee all equipment against defects in material and workmanship for two (2) years, and provide on-the-premises service during normal working hours for two years, at no cost to Owner if trouble is not caused by misuse, abuse, or accident, or at current labor rates if so caused. Provide manufacturer's written one-year guarantee for equipment and parts.

B. Service shall normally be available within 24 hours from service department of authorized distributor of manufacturer by factory trained servicemen.

INTRUSION ALARM SYSTEM
SECTION 28 3100
3595001000

- C. On-the-premises service at other than normal working hours to also be available, but labor charges for such calls to be paid by Owner at current labor rates.

PART 2 - DETAIL REQUIREMENTS AND PRODUCTS

2.1 SYSTEM OPERATION

- A. Activation of an intrusion alarm sensor shall cause a signal to be transmitted to a Central Station via telephone lines. Signal transmission shall be initiated by a built-in dialer unit. In addition to alarm reporting, system shall report trouble, low battery, and shunted zone indications.

2.2 SYSTEM DESCRIPTION

- A. A. Intrusion Detection Control Panels: Basis-of-design is the Honeywell VISTA 128BPT System, a burglary/access control/CCTV switching system that includes the following capabilities:
 - 1. Listed for UL Commercial Burglary.
 - 2. Supports up to 128 zones.
 - 3. Supports up to 8 separate partitions.
 - 4. Supports up to 150 users.
 - 5. Supports commercial wireless devices.
 - 6. Provides integrated security, access control, and CCTV switching capability.
 - 7. Provides supervision of peripheral devices.
 - 8. Supports long-range radio (LRR) communication.
 - 9. Provides scheduling capability to allow for automated operations.
 - 10. Supports alarm reporting via Internet.
 - 11. Interfaces with automation software.
 - 12. Monitors smoke detector maintenance signals
 - 13. Capable of being installed using existing wiring

2.3 MANUFACTURER

- A. Intrusion Detection Alarm Panel Manufacturer: System VISTA 128BPT by Honeywell, www.security.honeywell.com.

2.4 SYSTEM PERFORMANCE

- A. Control Panel: Existing control panel shall be verified by contractor to be an 8-partition, UL commercial and burglary control panel that supports up to 128 zones using basic hardwired, polling loop, and wireless zones, RF receivers, and relay modules. The control shall provide the ability to schedule time-driven events, and allow certain operations to be automated by pressing a single button. The system shall be capable of interfacing with an ECP long range radio (LRR) unit that can send Contact ID messages. The control shall provide integrated access control and CCTV-switching capability with the use of a single downloader and database.
1. Basic Hardwired Zones: Control shall provide 8 style-B hardwire zones.
 2. Optional Expansion Zones:
 - a. Polling Loop Expansion: Control shall support up to 120 additional hardwire zones using a built-in two-wire polling (multiplex) loop interface. The polling loop shall provide power and data to remote point modules, and constantly monitor the status of all zones on the loop. Maximum current draw shall not exceed 128 mA.
 - b. Wireless Expansion Zone: Control shall support up to 128 wireless zones using a 5800 series RF receiver (fewer if using hardwire and/or polling loop zones).
 3. Partitions: Control shall provide the ability to operate 8 separate areas, each functioning as if it had its own control.
 4. User Codes: Control shall accommodate 150 user codes, all of which can operate any or all partitions.
 5. Peripheral Devices: Control shall support up to 30 addressable ECP devices, which can be any combination of keypads, RF receivers, relay modules, and interactive phone module.
 6. Keypad/Annunciator: Control shall accommodate up to 16 keypads or six (6) touchscreen (i.e.; advanced user interface) keypads.
 7. Optional Output Relays: A total of 96 relay outputs shall be accommodated using relay modules. Each relay module shall provide four (4) Form C (normally open and normally closed) relays for general-purpose use.

INTRUSION ALARM SYSTEM
SECTION 28 3100
3595001000

8. Optional Vista Interactive Phone Module: The control shall support the ADEMCO 4285/4286 VIP Modules, which permit access to the security system.
9. Integrated Access Control
10. CCTV Switching: System shall be capable of supporting the VistaView 100 CCTV Switching System. The CCTV system shall be fully integrated and be event driven by Burglary or Access events. When cameras are not event driven, they shall be driven by an automatic preset dwell time.
11. Commercial Wireless Equipment: Control shall be compatible with UL Listed Commercial Wireless Security equipment.
12. Optional Keyswitch: Control shall support the ADEMCO 4146 Keyswitch on any one of the system's 8 partitions. If used, zone 7 is no longer available as a protection zone.
13. Voltage Triggers: System shall provide voltage triggers, which change state for different conditions. Used with devices such as a remote keypad sounder or keyswitch ARMED and READY LEDs.
14. Event Log: System shall maintain a log of different event types (enabled in programming). The event log shall provide the following characteristics:
 - a. Stores up to 512 events.
 - b. Viewable at the keypad or through the use of Compass software.
 - c. Printable on a serial printer, including zone alpha descriptors.
15. Scheduling: Provides the following scheduling capabilities:
 - a. Open/close schedules (for control of arming/disarming and reporting).
 - b. Holiday schedules (allows different time windows for open/close schedules).
 - c. Timed events (for activation of relays, auto-bypassing and un-bypassing, autoarming and disarming, etc.).
 - d. Access schedules (for limiting system access to users by time).
 - e. End User Output Programming Mode (provides 20 timers for relay control).
 - f. The system shall automatically adjust for daylight savings time.
16. Communication Features: Supports the following formats and features for the primary and secondary central station receivers:
 - a. Formats: ADEMCO Express; ADEMCO Contact ID 4 and 10 Digit Acct number.
 - b. Backup reporting: The system shall support backup reporting via the following: Secondary phone number; ECP long-range radio (LRR)

- interface; option to select long range radio (LRR) or dialup as the primary reporting method (dynamic signaling feature).
- c. Internet reporting: The system shall be capable of communicating with the central station via the internet using Alarmnet-i. It shall provide the user with the ability to control the system via a browser interface. All packet data transmitted to the monitoring station shall be encrypted with a minimum of 1024 bits of encryption.
- 17. Audio Alarm Verification Option: Provides a programmable Audio Alarm Verification (AAV) option that can be used in conjunction with an output relay to permit voice dialog between an operator at the central station and a person at the premises.
 - 18. Cross-Zoning Capability: Helps prevent false alarms by preventing a zone from going into alarm unless its cross-zone is also faulted within 5 minutes.
 - 19. Exit Error False Alarm Prevention Feature: System shall be capable of differentiating between an actual alarm and an alarm caused by leaving an entry/exit door open.
 - 20. Built-in User's Manual and Descriptor Review: For end-user convenience, the control panel shall contain a built-in User's Manual.
 - 21. Programming: Control shall be capable of being programmed locally or remotely using the ADEMCO Compass Downloader.

2.5 COMPONENTS

- A. Equipment and accessories furnished under the terms of these specifications shall be the standard products of the manufacturers specified or required. All equipment shall be listed by U.L. All equipment and accessories shall be compatible with the system.
 - B. System Integration: System shall integrate with facility doors, windows, and departments. The system shall also integrate with external systems, such as building appliances and building alert systems for remote control and central collection of external system alerts. When integrated with external systems, the system shall connect to the external system to receive status changes by way of a dry contact output from the external system. The system shall use its user interface to provide local status messages from external systems, providing for the initiation of local building policies. Optionally, the system may transmit information to an off-site monitoring service to provide initiation of remote policies when appropriate. The installer shall follow manufacturer's instructions when installing and programming system equipment.
- 1. V-Plex Bus Extensions: Extended system V-Plex bus branch circuits shall be scalable to increase the total size of the bus in larger installations. Branch circuits leading from different buildings or from different floors in multi-story buildings

INTRUSION ALARM SYSTEM
SECTION 28 3100
3595001000

shall be isolated from one another so that a shorted or grounded branch circuit is isolated away from other near-side branch circuits, allowing other V-Plex devices to be isolated so that they can continue to operate.

2. Zone Input: System zone inputs allow the system to sense the change in state of an output from an external device, such as a door/window position sensor, a motion detector, a relay output from an appliance, the output of an external alert system, or other devices that provide a dry closure output.
3. Combined AlarmNet-I (Internet) and AlarmNet-GSM (Global System for Mobile) Fire Alarm Communication: The facility system shall be monitored using both the AlarmNet-I and the AlarmNet-G Communication services. The system shall use Honeywell's AlarmNet IGSMCF Fire Alarm transmitter or equivalent. The communication service shall employ a two-way Internet connection through AlarmNet Communication Service as the primary method of communication, and then the two-way GPRS (General Packet Radio Service) as the secondary means of communication and shall use SMS (Short Message Service) as a tertiary means of communication. The equipment shall be UL listed for use in this application. The installer shall follow manufacturer's instructions when installing the AlarmNet unit.
4. VSI Bus Isolation and Integrity: System V-Plex bus branch circuits shall be isolated from one another so that a shorted, overloaded, or grounded branch circuit is isolated away from other near-side branch circuits, allowing undamaged V-Plex bus circuits to continue to operate. VSI Isolation modules shall be installed at near-side connections to cable runs leading to additional buildings, at cable runs leading to additional floors in multi-story buildings, and at junction boxes leading to multiple VPlex branch circuits within the system. The installer shall use the Honeywell VSI module or equivalent.
5. Zone Input: System zone inputs allow the system to sense the change in state of an output from an external device, such as a door/window position sensor, a motion detector, a relay output from an appliance, the output of an external alert system, or other devices that provide a dry closure output.
6. Door Contact: V-Plex: Honeywell Model 4939SN surface mount sensor.
7. Motion Detector, Wall-Mounted, V-Plex: Honeywell Model DT7500SN V-Plex Dual-Tec Motion Detector.
8. Keypad, Alpha Display: Honeywell Vista 6160 keypad.
9. End of line resistors, as required.
10. Power Supplies: Altronics SMP Series with output voltage and capacity as required. Provide with appropriate transformer, enclosure(s), and battery(s). Battery(s) shall be sized to provide 24 hours of backup power. Provide power supplies as necessary.

11. RJ-31X mounted on Main Telephone Terminal Backboard.
- C. Wiring: The contractor shall provide cables consistent with the manufacturer's recommendations. The following general guidelines shall be followed for wiring installation:
1. Wiring shall be appropriately color-coded with permanent wire markers. Copper conductors shall be used.
 2. All signal cables provided under this contract shall be Class II, plenum-rated cable where required. Where subject to mechanical damage, wiring shall be enclosed in metal conduits or surface metallic raceway.
 3. Data wires shall not be enclosed in conduit or raceways containing AC power wires.
 4. Where EMI may interfere with the proper operation of the DACS circuits, twisted/shielded cable shall be used.

PART 3 - EXECUTION

3.1 INSTALLATION REQUIREMENTS

- A. Work shall be installed as shown on the Drawings in accordance with the manufacturer's diagrams and recommendations, except where otherwise indicated.
- B. Electrical Contractor shall retain the services of the duly appointed representative as specified hereinbefore, who shall furnish all equipment, make all connections to same, and place system in operation. Technician and workman employed shall be particularly skilled in this type of work.
- C. At existing sites, the existing system shall be tested as soon as possible after award of contract and prior to preparing submittals. Contractor shall test entire system to ensure proper operation. Any defects or deficiencies found shall be listed and presented to Owner in letter form. It will be assumed that existing equipment is fully functional unless identified otherwise by Contractor.
- D. Control panel shall be mounted with sufficient clearance for observation and testing.
- E. All junction boxes must be clearly marked for distinct identification.
- F. Panel enclosures shall comply with the Requirements of UL 864. Enclosures having doors over forty-eight inches (48") in height shall be provided with a three (3) point catch and lock; all other doors shall contain a cabinet type cylinder lock. Inserts shall be blind fastened so that no screws show on panel front.
- G. Detectors shall be installed in accordance with manufacturer's written instructions in areas as indicated on the Drawings.
- H. Circuits shall be terminated on screw terminals. Terminal blocks shall be Allen-Bradley Bulletin 1492 with 600 volt screw terminals for #22 to #10 conductors, mounted to type

INTRUSION ALARM SYSTEM
SECTION 28 3100
3595001000

N22 channel, or approved equal. Submittal shall show internal elevation of terminal cabinets with equipment laid out.

- I. All cables shall be run through fanning strip to terminals of terminal blocks.
- J. All cables entering terminal cabinet shall be identified with T&B Vinyl, Brady Permashield mylar markers, or equal. Upon completion of installation, six (6) copies of one-line "as-built" wiring diagram shall be furnished to Architect.
- K. Each cable run on wiring diagram shall be identified with exact wire marker code (numerical or alphabetical) as appears in terminal cabinets.
- L. Detector locations shown on drawings are approximate only. Exact locations shall be coordinated with lighting and mechanical equipment and shall be placed in accordance with manufacturer's recommendations (with respect to supply air diffusers, etc.).
- M. Station locations shall be identified by school's actual room numbers and system shall be programmed accordingly. Coordinate actual room numbers with District. Coordinate final programming with District. Contractor shall furnish a printed copy of final programming to District.
- N. End-of-line resistors shall be installed at locations readily accessible, not above an elevation of 10 feet above finish floor or grade, or as shown on Drawings.
- O. No splices shall occur in underground pullboxes. System wiring shall be continuous, without splices, from terminal cabinet to terminal cabinet and control panel to devices. All interior pullboxes shall be accessible and locations shall be recorded on "As-Built" drawings.
- P. Door contacts shall be located 6" from strike side of door and both the switch and magnet shall be "glued" in place with clear silicone. Wiring shall enter door frame through jamb. Do not drill headers.
- Q. Each detector installed in this contract shall have a popit. Each door contact installed in this contract shall have a popit, unless door contacts are shown grouped on drawings. In rooms with accessible ceilings, mount popit in junction box above ceiling. Where hard ceilings occur, provide flush box high on wall or on ceiling with blank finish plate. Wiring shall go to popits, then down to detectors.
- R. Protected areas accessing remote keypads shall be wired and connected on delay zone, separate from all other protected areas.
- S. After all equipment is installed and is operational, Intrusion Alarm System subcontractor shall set angle settings, sensitivity settings, etc., of each detector to ensure optimum performance and minimal false alarms. Mask out areas of each motion type detector to remove sources of false alarms (windows, heaters, air diffusers, etc.) from detection zones.

3.2 CONSTRUCTION MEETINGS

- A. The Contractor shall schedule construction meetings at the jobsite as follows:

1. Pre-rough-in meeting shall occur before installation of any boxes, raceways, etc. Exact locations of all detectors shall be established as recommended by the Intrusion Alarm System subcontractor.
 2. Prewire meeting shall occur after raceways are installed and prior to pulling of any wire or cable.
 3. Pre-termination meeting shall occur after wire and cable has been installed and prior to termination.
- B. Meetings shall be scheduled by the Contractor on a building by building basis and shall include the Project Inspector, School's Representative, the electrical subcontractor, and the Intrusion Alarm System subcontractor as a minimum.
- C. One-half to three-quarters of the way through project, District Facilities will set up a meeting (preferably at the school site) with decision makers from Facilities, Police Services, Maintenance, Maintenance Alarm Tech, General Contractor, Alarm Sub-contractor, and School Administrator to review the alarm protocol and to identify responsible personnel and timelines.

3.3 TESTS

- A. After all equipment specified herein has been installed and is in operating condition, performance tests shall be conducted to determine that installation and components comply with these specifications.
1. Testing shall be scheduled by the Contractor and shall be conducted at time least disruptive to school activities and as approved by District. Contractor shall provide technicians to conduct all testing (from same firm preparing submittals and performing intrusion alarm work). Testing shall be coordinated to include the Project Inspector and a representative from Engineer's office.
 2. At time of testing, Contractor shall ensure that his submittal will reflect all materials and work necessary to make new equipment function properly with existing.
 3. Contractor shall furnish all instruments and personnel required for tests.
 4. Conduct tests for following:
 - a. Verify that the system is free of grounds or open circuits. The central control board shall indicate when a ground or open circuit exists.
 - b. Verify that devices are functioning as specified.
- B. Testing shall be reconducted to verify correction of any defect found in initial testing.
- C. After system is completely tested, the Contractor shall take the following actions with the Owner:
1. The Contractor will schedule a meeting with the Alarm Sub-contractors and Owner's Representatives to determine alarm zone and device nomenclature. The Contractor shall ensure that the alarm zone and device nomenclature matches

INTRUSION ALARM SYSTEM
SECTION 28 3100
3595001000

the actual building and door or room numbers used by the school. Architectural numbering shall not be used. Once confirmed, the Contractor shall demonstrate this to Owner's Representatives.

- END OF SECTION -

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Engineered fill materials.
 - 2. Imported engineered fill material.
 - 3. Landscape backfill material'
 - 4. Decomposed granite.
 - 5. Aggregate base.

1.2 RELATED REQUIREMENTS

- A. Section 01 5000, Temporary Facilities and Controls.
- B. Section 01 5713, Erosion Control.
- C. Section 01 8113, Sustainable Design Requirements, for CAL-Green **[and Collaborative for High Performance Schools (CHPS)]** general requirements and procedures.
- D. Section 31 2333, Trenching and Backfilling.
- E. Section 32 1200, Asphalt Concrete Paving.
- F. Section 32 1600, Site Concrete.
- G. Section 33 0000, Utilities
- H. Section 33 4000, Storm Drainage Utilities.

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CAL Green), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- C. Local Jurisdiction: Any work within the street, highway or right-of-way shall be performed in accordance with the requirement of the governmental agencies having jurisdiction, and shall not begin until all of those governing authorities have been notified.
- D. ASTM International (ASTM):
 - 1. D698-00 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures, Using 5.5 lb (2.49 Kg) Rammer and 12 inch (304.8 mm) Drop.
 - 2. D1556-00 - Test Method for Density of Soil in Place by the Sand-Cone Method.

**EARTHWORK
SECTION 31 0000
3595001000**

3. D1557-02e2 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 10 lb. (4.54 Kg) Rammer and 18 inch (457 mm) Drop.
4. D3017-05 Test Methods for Moisture Content of Soils and Soil-Aggregate Mixture by Nuclear Methods (Shallow Depth).
5. D422-63(2007) e1 Test Method for Particle Size Analysis of Soil.
6. D4318-05 Test Method for Liquid Limit, Plastic Limit, and Plasticity Limit.

E. CALTRANS Standard Specifications Section 17.

F. CAL-OSHA, Title 8, Section 1590 (e).

1.4 ADMINISTRATION REQUIREMENTS

A. Submittal Procedures:

1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
3. Sustainable Design Submittals shall comply with the additional requirements of Section 01 8113, Sustainable Design Requirements.

B. Site Visitation: All bidders interfacing with existing conditions shall visit the site prior to bid to verify general conditions of improvements. Discrepancies must be reported prior to the bid for clarification.

1.5 ACTION SUBMITTALS

A. Provide supplier's descriptive literature for all products to demonstrate compliance with specified attributes.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Contractor / Installer.

1.7 CLOSEOUT SUBMITTALS

A. Guarantee: Submit subcontractor's guarantee.

1.8 QUALITY ASSURANCE

A. Contractor / Installer shall have been in business for five (5) years providing/finishing similar size projects and complexity.

B. Contractor shall be solely responsible for all subgrades built. Failures resulting from inadequate compaction or moisture content are the responsibility of the contractor. Contractor shall be solely responsible for any and all repairs.

C. The representatives of the Owner's testing lab will not act as supervisor of construction, nor will they direct construction operations. Neither the presence of the Owner's testing

lab representatives nor the testing by the Owner's testing lab shall excuse the contractors or subcontractors for defects discovered in their work during or following completion of the project. Correcting of inadequate compaction or moisture content is the sole responsibility of the contractor.

- D. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.
- E. All materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.
- F. Tests (See Part 3, Article "Testing and Observation" for Compaction Testing).

1.9 DELIVERY, STORAGE AND HANDLING

- A. Transport, store and handle in strict accord with the local jurisdiction.

1.10 FIELD CONDITIONS

1.11 EXISTING SITE CONDITIONS

- A. Contractor shall acquaint himself with all site conditions. If unknown active utilities are encountered during work, notify Architect promptly for instructions. Failure to notify will make Contractor liable for damage to these utilities arising from Contractor's operations subsequent to discovery of such unknown active utilities.
- B. Existing civil, mechanical and electrical improvements are shown on respective site plans to the extent known. Should the Contractor encounter any deviation between actual conditions and those shown, he is to immediately notify the Architect before continuing work.

1.12 ON SITE UTILITY VERIFICATION AND REPAIR PROCEDURES

- A. Ground-breaking requirements:
 - 1. All underground work performed by a Contractor must be authorized by the District's Construction Manager or the Low Voltage Consultant prior to start of construction.
 - 2. The Contractor is to obtain and keep the original School's construction utility site plans on site during all excavation operations. Contractor can contact the District's Construction Manager, Facilities Manager, or the Low Voltage Consultant to procure the drawings.
- B. Underground Utility Locating:
 - 1. The contractor shall hire an Underground Utility Locating Service to locate existing underground utility pathways in areas effected by the scope of work for excavation.
 - 2. Contractor must use an underground utility locator service with a minimum of 3 years experience. The equipment operator must have demonstrated experience.

EARTHWORK
SECTION 31 0000
3595001000

Contact Norcal Underground Locating (800/986-6722) or Precision Locating (800/577-7324)

3. The Underground Utility Locator Service must have the use of equipment with the ability to locate by means of inductive clamping, induction, inductive metal detection, conductive coupling, or TransOnde (Radiodetection) to generate signals, passive locating (free scoping) for "hot" electric, and metal detector.
4. The Underground Utility Locator Service must be able to locate existing utilities at a depth of at least 72".
5. The Underground Utility Locator Service must be able to locate but are not limited to locating the following types of utility pathways:
 - a. All conduit pathways containing 110 volt or greater 50-60Hz electrical wire.
 - b. All conduit pathways containing an active cable TV system.
 - c. All conduit pathways containing wire or conductor in which a signal can be attached and generated without damaging or triggering the existing systems.
 - d. All empty conduit pathways or pipe in which a signal probe or sonde (miniature transmitter) can be inserted.
 - e. All conduit pathways containing non-conductive cables or wires in which a signal probe or sonde (miniature transmitter) can be inserted.
 - f. All plastic and other nonconductive water lines in which a TransOnde Radiodetection) or other "transmitter" can be applied to create a low frequency pressure wave (signal) without damaging or triggering the existing systems.
 - g. All copper or steel waterlines and plastic or steel gas lines.
6. All markings made by the Underground Utility Locator Service or other shall be clear and visible.
7. The contractor shall maintain all markings made by Underground Utility Locator Service or other throughout the entire length of the project.
8. The Underground Utility Locator Service shall provide the contractor with two sets of maps showing the location of utilities and average depth. They will be referenced to permanent buildings. Contractor will deliver one copy to the district at no additional charge.
9. Contractor is responsible to contact Underground Service Alert (U.S.A. 800/227-2600) and receive clearance prior to any excavation operations.
10. Contractor shall inform the (District's Construction Manager)(Architect)(Owner) no later than five (5) days prior to the date scheduled for the utility locator service to be on site.

1.13 PROTECTION

- A. Adequate protection measures shall be provided to protect workmen and passers-by on and off the site. Adjacent property shall be fully protected throughout the operations. Blasting will not be permitted. Prevent damage to adjoining improvements and properties both above and below grade. Restore such improvements to original condition should damage occur. Replace trees and shrubs outside building area disturbed by operations.

- B. In accordance with generally accepted construction practices, the Contractor shall be solely and completely responsible for working conditions at the job site, including safety of all persons and property during performance of the work. This requirement shall apply continuously and shall not be limited to normal working hours.
- C. Any construction review of the Contractor's performance conducted by the Geotechnical Engineer is not intended to include review of the adequacy of the Contractor's safety measures, in, on, or near the construction site.
- D. Provide shoring, sheeting, sheet piles and or bracing to prevent caving, erosion or gullyng of sides of excavation.
- E. Surface Drainage: Provide for surface drainage during period of construction in manner to avoid creating nuisance to adjacent areas. The contractor shall make a reasonable effort on a daily basis to keep all excavations and the site free from water during entire progress of work, regardless of cause, source, or nature of water.
- F. Adjacent streets and sidewalks shall be kept free of mud, dirt or similar nuisances resulting from earthwork operations.
- G. The site and adjacent influenced areas shall be watered as required to suppress dust nuisance. Dust control measures shall be in accordance with the local jurisdiction.
- H. Trees: Carefully protect existing trees that are to remain. Provide temporary irrigation as necessary to maintain health of trees.

1.14 SEASONAL LIMITS

- A. No fill material shall be placed, spread or rolled during unfavorable weather conditions. When work is interrupted by rains, fill operations shall not be resumed until field tests indicate that moisture content and density of fill are satisfactory.
- B. Excessively wet fill material shall be bladed and aerated per Article "Subgrade Preparation".

1.15 TESTING

- A. General: Refer to Section 01 4523 - TESTING AND INSPECTION SERVICES, AND STRUCTURAL TESTS AND INSPECTIONS LIST, DSA-103.
- B. Geotechnical Engineer: Owner is retaining a Geotechnical Engineer to determine compliance of fill with Specifications, and to direct adjustments in fill operations. Costs of Geotechnical Engineer will be borne by Owner; except those costs incurred for re-tests or re-inspection will be paid by Owner and backcharged to Contractor.
 - 1. If Contractor elects to process or mine onsite materials for use as Suitable Fill, Aggregate Sub Base, Aggregate Base, Rock, Crushed Rock or sand the cost of all testing of this material shall be paid for by the Contractor.
 - 2. Testing of import fill for compliance with Department of Toxic Substance Control (DTSC) shall be paid for by the Contractor.

**EARTHWORK
SECTION 31 0000
3595001000**

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Engineered Fill Materials: All fill shall be of approved local materials supplemented by imported fill if necessary. "Approved" local materials are defined as local soils tested and approved by Geotechnical Engineer free from debris, and concentrations of clay and organics; and contain rocks no larger than 3-inches in greatest dimension. The soil and rock should be thoroughly blended so that all rock is surrounded by soil. This may require mixing of the soil and rock with a dozer prior to placement and compaction. Clods, rocks, hard lumps or cobbles exceeding 3-inches in final size shall not be allowed in the upper 6 inches of any fill. Native clay or clayey soils will not be permitted within the upper 12 inches of building pad areas or paved areas.
- B. Imported Engineered Fill Material: Imported fill may be required to complete work. Proposed import fill material shall meet the above requirements; shall be similar to the native soils. Import fill shall meet the above requirements; shall have plasticity index of 20 or less; an Expansion Index of 15 or less; be free of particles greater than 3-inch (3") in largest dimension; be free of contaminants and have corrosion characteristics within the acceptable limits. All import fill material shall be tested and approved by Soils Engineer prior to transportation to the site. Proposed fill material shall comply with DTSC guidelines to include Phase 1 environmental site assessment and related tests. Refer to the October 2001 DTSC Information Advisory for clean imported fill material.
1. DTSC TESTING: Site work contractor is to coordinate testing with an analytical lab, hired by the owner, licensed by the State of California for the DTSC testing. The costs associated with testing will be paid by the contractor.
 2. DTSC testing shall include documentation as to the previous land use, location, and history. Soils shall be analyzed for all compounds of concern to ensure the imported soil is uncontaminated and acceptable. Testing shall be performed per the recommendations included in DTSC Imported Fill Advisory (http://www.dtsc.ca.gov/Schools/upload/SMP_FS_Cleanfill-Schools.pdf). Soils shall be tested prior to import to the project site.
 3. Lab shall determine geographically which tests and analysis comparison will be appropriate for the testing. (CAM 17 / Title 22); (RWQCB) Regional Water Quality Control Board; or (OEHHA) Office of Environmental Health Hazard Assessment.
 4. Frequency of testing shall be conducted in accordance with DTSC's Imported Fill Advisory as follows;

Fill Material Sample Schedule	
Area Of Individual Borrow Area	Sampling Requirements
2 Acres or less	Minimum of 4 samples
2 to 4 Acres	Minimum of 1 sample every ½ acre
4 to 10 Acres	Minimum of 8 samples

**EARTHWORK
SECTION 31 0000
3595001000**

Greater than 10 Acres	Minimum of 8 locations with 4 subsamples per location
-----------------------	---

Volume of Borrow Area Stockpile	
Up to 1,000 Cubic Yards	1 sample per 250 cubic yards
1,000 to 5,000 Cubic Yards	4 samples for the first 1000 cubic yards + 1 sample per each additional 500 cubic yards
Greater than 5,000 Cubic Yards	12 samples for the first 5,000 cubic yards + 1 sample per each additional 1,000 cubic yards

5. Reports/ Documentation
 - a. Results of the testing analysis shall be sent to the Owner; Architect; Project Inspector, Project Civil Engineer, DTSC, and DSA. Letter shall reference DSA file and application numbers.
- C. Landscape Backfill Material:
 1. The top 3" of native topsoil stripped from the site may be used for landscape backfill material.
- D. Water: Furnish all required water for construction purposes, including compaction and dust control. Water shall be potable.
- E. Aggregate Base: Provide Class 2 3/4" Aggregate Base conforming to standard gradation as specified in Cal Trans Standard Specifications, Section 26,-1.02A.
- F. Decomposed Granite: Decomposed Granite shall be well graded mixture of fine to 1/8" particles in size with no clods. The material shall be free of vegetation, other soils, debris and rock. The material shall be redish-tan to tan in color.
- G. Decomposed Granite Solidifier: PolyPavement or equal.

PART 3 - EXECUTION

3.1 INSPECTION LAYOUT AND PREPARATION

- A. Prior to installation of the work of this Section, carefully inspect and verify by field measurements that installed work of all other trades is complete to the point were this installation may properly commence
- B. Layout all work, establish grades, locate existing underground utilities, set markers and stakes, setup and maintain barricades and protection facilities; all prior to beginning

**EARTHWORK
SECTION 31 0000
3595001000**

actual earthwork operations. Layout and staking shall be done by a licensed Land Surveyor or Professional Civil Engineer.

- C. Verify that specified items may be installed in accordance with the approved design.
- D. In event of discrepancy, immediately notify Owner and the Architect. Do not proceed in discrepant areas until discrepancies have been fully resolved.

3.2 PERFORMANCE

A. GENERAL:

- 1. General: Do all grading, excavating and cutting necessary to conform finish grade and contours as shown. All cuts shall be made to true surface of subgrade.
- 2. Archaeological Artifacts: Should any artifacts of possible historic interest be encountered during earthwork operations, halt all work in area of discovery and immediately contact the Architect for notification of appropriate authorities.
- 3. Degree of Compaction: Percentage of maximum density, hereinafter specified as degree of compaction required, means density equivalent to that percentage of maximum dry density determined by ASTM D1557 Compaction Test method, and such expressed percentage thereof will be minimum acceptable compaction for specified work.
- 4. Moisture Content: Moisture content shall be as noted below and as called for on the plans. Moisture content shall be maintained until subgrade is covered by surfacing materials.

3.3 DEMOLITION, DISPOSAL AND DISPOSITION OF UNDESIRABLE MAN-MADE FEATURES

- A. All other obstructions, such as abandoned utility lines, septic tanks, concrete foundations, and the like shall be removed from site. Excavations resulting from these removal activities shall be cleaned of all loose materials, dish shaped, and widened as necessary to permit access for compaction equipment. Areas exposed by any required over-excavation should be scarified to a depth of 12", moisture-conditioned to near optimum moisture content, and recompacted to at least 95% of the maximum dry density.

3.4 TESTING AND OBSERVATION

- A. All grading and earthwork operations shall be observed by the Geotechnical Engineer or his representative, serving as the representative of the Owner.
- B. Field compaction tests shall be made by the Geotechnical Engineer or his representative. If moisture content and/or compaction are not satisfactory, Contractor will be required to change equipment or procedure or both, as required to obtain specified moisture or compaction. Notify Geotechnical Engineer at least 48 hours in advance of any filling operation.
- C. Earthwork shall not be performed without the notification or approval of the Geotechnical Engineer or his representative. The Contractor shall notify the Geotechnical Engineer at least two (2) working days prior to commencement of any aspect of the site earthwork.

- D. If the Contractor should fail to meet the compaction or design requirements embodied in this document and on the applicable plans, he shall make the necessary readjustments until all work is deemed satisfactory, as determined by the Geotechnical Engineer or Architect/Engineer.
- E. After each rain event Geotechnical Engineer shall test fill material for optimum moisture. Do not place any fill material until desired moisture is achieved.

3.5 CLEARING AND GRUBBING

- A. Prior to grading, remove all debris off-site. Remove trees and brush including the root systems. Holes resulting from tree and brush removal should be prepared and backfilled in accordance with paragraphs 3.7, 3.8, 3.9, and 3.10. This may require deepening and/or widening the holes to adequately remove disturbed soil and provide room for compaction equipment. Strip the surface of all organics. Strippings meeting the requirements of Section 32 9000 may be used in landscape areas only.

3.6 CUTTING

- A. Building pads that are located within a cut/fill transition area will have to be overexcavated to provide a semi-uniform fill beneath the building pad. The portions of building pads located in cut areas shall be overexcavated to provide no more than 1 foot difference in fill placed in the same building pad.
- B. Do all cutting necessary to bring finish grade to elevations shown on Drawings.
- C. When excavation through roots is necessary, cut roots by hand.
- D. Carefully excavate around existing utilities to avoid unnecessary damage. The contractor shall anticipate and perform hand work near existing utilities as shown on the survey, without additional claims or cost.

3.7 STRUCTURAL EXCAVATION

- A. General: Excavate to bear on firm material at contract depth shown on Structural Drawings.
- B. Footings: All footing excavations shall be of sufficient width for installation of formwork, unless earth will retain its position during concreting. All portions of footings above grade must be formed. In the event that footings are placed against earth, footing widths below grade shall be increased 2 inches from those shown on Drawings and positive protection shall be provided for top corners of trench.
- C. Unsuitable Ground: Any errors in structural excavation, soft ground, or clay soils found when excavating shall be reported to Architect. In no case shall work be built on any such soft or clayey unsuitable surface without direction from the Architect. Restore excavations to proper elevation with engineered fill material compacted to 95% of dry density.

**EARTHWORK
SECTION 31 0000
3595001000**

3.8 SUBGRADE PREPARATION

- A. Grade compact and finish all subgrades within a tolerance of 0.10' of grades as indicated on Drawings and so as not to pool water. Subgrade within building pads and concrete walks shall be within 0.05' of grades indicated.
- B. After clearing, grubbing and cutting, subsurface shall be plowed or scarified to a depth of at least 12", until surface is free from ruts, hummocks or other uneven features. Moisture condition to 2% above optimum moisture content and recompact to at least 95% of the maximum dry density as determined by ASTM Test Method D1557. If the existing soils are at a water content higher than specified, the contractor shall provide multiple daily aerations by ripping, blading, and/or discing to dry the soils to a moisture content where the specified degree of compaction can be achieved. After seven consecutive working days of daily aerations, and the moisture content of the soil remains higher than specified, the contractor shall notify the architect. If the existing soils have a moisture content lower than specified, the contractor shall scarify, rip, water and blade existing soil to achieve specified moisture content. The contractor shall make proper allowance in schedule and methods to complete this work.
- C. After subgrade for fill within building pad area or within paved areas has been cleared, plowed and scarified, it shall be disked or bladed until uniform and free from large clods, brought to 2% above optimum moisture content and compacted to not less than 95% of maximum dry density, as determined by ASTM Test Method D1557, and such expressed percentage thereof will be minimum acceptable density for specified work.
- D. Subgrade in areas to receive landscaping shall be compacted to (85%).
- E. Where Contractor over-excavates building pads through error, resulting excavation shall be recompacted as engineered fill at Contractor's expense.

3.9 PLACING, SPREADING AND COMPACTING FILL MATERIAL IN BUILDING PAD AND PAVEMENT AREAS

- A. Selected fill material shall be placed in layers which, when compacted, shall not exceed 6 inches in compacted thickness. Each layer shall be spread evenly and thoroughly mixed to insure uniformity in moisture content.
- B. Selected fill material shall be moisture-conditioned to specified moisture content. Selected fill material shall be unfrozen. When moisture content of fill material is below that specified, add water until proper moisture content is achieved. When moisture content is above that specified, aerate by blading or other methods mentioned in 3.08 B until moisture content is satisfactory.
- C. After each layer has been placed, mixed and spread evenly, it shall be thoroughly compacted to a minimum of 90% as determined by the ASTM D1557 Compaction Test. Compact each layer over its entire area until desired density has been obtained.
- D. Recomposition of Fill in Trenches and Compaction of Fill Adjacent to Walls: Where trenches must be excavated, backfill with material excavated. Place in lifts that when compacted do not exceed 6", moisture conditioned to (optimum)(2% above optimum)

moisture content, and compact to a minimum of 90% relative compaction in building pad and paved areas, and to 90% relative compaction in landscape areas.

- E. Jetting of fill materials will not be allowed.

3.10 FINAL SUBGRADE COMPACTION

- A. Building Pads: Upper 12" of all final building pad subgrades (including future buildings) shall be uniformly compacted at specified moisture content to at least 90% of maximum dry density, as determined by ASTM D1557 Compaction Test, regardless of whether final subgrade elevation is attained by filling, excavation, or is left at existing grade. After acceptance of final compaction test, contractor shall maintain the required moisture content of subgrade until concrete flatwork is placed.
- B. Paved Areas: Upper 12" of all final subgrades supporting pavement sections and all other flatwork shall be brought to specified moisture content and shall be uniformly compacted to not less than 95% of maximum dry density, regardless of whether final subgrade elevation is attained by filling, excavation, or is left at existing grade. After acceptance of final compaction test, contractor shall maintain the required moisture content of subgrade until concrete flatwork is placed.
- C. Other Fill and Backfill: Upper 12" of all other final subgrades or finish grades shall be compacted to 90% of maximum dry density.
- D. Gravel Fill: Do not place compacted gravel fill until after underground work and foundations are in place. Compact gravel fill with vibratory plate or similar equipment to preclude settlement.

3.11 PLACING, SPREADING, AND COMPACTION OF LANDSCAPE BACKFILL MATERIALS

- A. All landscaped areas shall receive topsoil. After subgrade under landscape area has been scarified and brought to 85% maximum dry density, top soil shall be placed evenly to depth of 12" at 85% of maximum dry density.
- B. Project Inspector must verify that materials are uniformly spread to minimum depth specified.

3.12 SLOPE CONSTRUCTION

- A. Cut slopes shall be constructed to no steeper than 2:1(horizontal:vertical). Fill slopes shall be constructed to no steeper than 2:1 (horizontal:vertical). Prior to placement of fill on an existing slope the existing slope shall be benched. The benches shall be in a ratio of 2 horizontal to 1 vertical. The face of the fill slopes shall be compacted as the fill is placed, or the slope may be overbuilt and then cut back to the design grade. Compaction by track walking will not be allowed.

3.13 FINISH GRADING

- A. At completion of project, site shall be finished graded, as indicated on Drawings. Finish grades shall be "flat graded" to grades shown on the drawing. Mounding of finish grades

EARTHWORK
SECTION 31 0000
3595001000

will not be allowed unless otherwise directed on the landscape drawings. Tolerances for finish grades in drainage swales shall be $\pm 0.05'$. Tie in new and existing finish grades. Leave all landscaped areas in finish condition for lawn seeding. Landscaped planters shall be graded uniformly from edge of planter to inlets. If sod is used for turf areas the finish grade on which it is placed shall be lowered to allow for sod thickness.

- B. All landscape areas shall be left free of rock or foreign material.
- C. All landscape areas shall be approved by Architect prior to any planting.

3.14 SURPLUS MATERIAL

- A. Excavated material not required for grading or backfill shall be removed from site at contractor's expense.

3.15 CLEANING

- A. Refer to Section 01 7700.
- B. Remove from fill all vegetation, wood, form lumber, casual lumber, and shavings, in contact with ground; buried wood will not be permitted in any fill.

END OF SECTION

s:\master specifications\division 31 - earthwork\31 0000_earthwork.docx
Received from WCEI: June 7, 2018, Updated format: 9-3-21

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Trench backfill materials.

1.2 RELATED REQUIREMENTS

- A. Section 01 5000, Temporary Facilities and Controls.
- B. Section 01 8113, Sustainable Design Requirements, for CAL-Green general requirements and procedures
- C. Section 31 0000, Earthwork.
- D. Section 32 8000, Irrigation.
- E. Section 33 0000, Utilities
- F. Section 33 4000, Storm Drainage Utilities.

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CAL Green), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- C. California Plumbing Code (CPC), edition as noted on the drawings.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Submittal Procedures:
 - 1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
 - 2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
 - 3. Sustainable Design Submittals shall comply with the additional requirements of Section 01 8113, Sustainable Design Requirements.
- B. Coordination:
 - 1. General Contractor shall coordinate work as herein specified, in accordance with drawings and as required to complete scope of work with all related trades.

TRENCHING AND BACKFILLING
SECTION 31 2333
3595001000

1.5 ACTION SUBMITTALS

- A. Provide supplier's descriptive literature for all products to demonstrate compliance with specified attributes:

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For contractor / Installer.

1.7 CLOSEOUT SUBMITTALS

- A. Guarantee: Submit subcontractor's guarantee.

1.8 QUALITY ASSURANCE

- A. Contractor / Installer shall have been in business for five (5) years providing/finishing similar size projects and complexity.
- B. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.
- C. All materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.

1.9 DELIVERY, STORAGE AND HANDLING

- A. Transport, store and handle in strict accord with the local jurisdiction.

1.10 FIELD CONDITIONS

- A. Contractor shall acquaint himself with all existing site conditions. If unknown active utilities are encountered during work, notify Architect promptly for instructions. Failure to notify will make Contractor liable for damage to these utilities arising from Contractor's operations subsequent to discovery of such unknown active utilities.
- B. Trench dewatering may be necessary. Contractor shall provide any and all tools, equipment and labor necessary for trench dewatering no matter what the source. Dewatering shall be continuous until all site utilities are installed and backfilled.

1.11 PROTECTION

- A. Adequate protection measures shall be provided to protect workers and passers-by on and off the site. Adjacent property shall be fully protected throughout the operations. Blasting will not be permitted. Prevent damage to adjoining improvements and properties both above and below grade. Restore such improvements to original condition should damage occur. Replace trees and shrubs outside building area disturbed by operations. Repair all trenches in grass areas with new sod (seeding not permitted) and "stake-off" for protection.

TRENCHING AND BACKFILLING
SECTION 31 2333
3595001000

- B. Contractor shall be solely and completely responsible for working conditions at the job site, including safety of all persons and property during performance of the work. This requirement shall apply continuously and shall not be limited to normal working hours.
- C. Any construction review of the Contractor's performance conducted by the Architect or Owner is not intended to include review of the adequacy of the Contractor's safety measures, in, on or near the construction site.
- D. Provide shoring, sheeting, sheet piles and or bracing to prevent caving, erosion or gulying of sides of excavation.
- E. Surface Drainage: Provide for surface drainage during period of construction in manner to avoid creating nuisance to adjacent areas. Keep all excavations free from water during entire progress of work, regardless of cause, source or nature of water.
- F. Adjacent streets and sidewalks shall be kept free of mud, dirt or similar nuisances resulting from earthwork operations.
- G. The site and adjacent influenced areas shall be watered as required to suppress dust nuisance.
- H. Trees: Carefully protect existing trees which are to remain.

1.12 TRENCH SAFETY PROVISIONS

- A. General Contractor shall be solely responsible for safety design, construction and coordination with agencies having jurisdiction. If such plan varies from shoring system standards established by Construction Safety Orders, plan shall be prepared by registered civil or structural engineer.
- B. Nothing herein shall be deemed to allow use of shoring, sloping or protective system less effective than that required by Construction Safety Orders of California State Division of Industrial Safety.
- C. When trenching through paved surface, provide steel trench plates to cover open trenches daily until trenches are backfilled.

1.13 SEASONAL LIMITS

- A. No backfill material shall be placed, spread or rolled during unfavorable weather conditions. When work is interrupted by heavy rains, full operations shall not be resumed until field tests indicate that moisture content and density of fill are satisfactory.
- B. Material above optimum moisture shall be processed per Section 31 0000, Part 3, Article "Subgrade Preparation".

1.14 TESTING

- A. General: Refer to Section 31 0000, Part 1, Article "Testing" and Part 3, Article "Testing and Observation".

TRENCHING AND BACKFILLING
SECTION 31 2333
3595001000

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Backfill materials: Pipeline and conduit trench backfill as shown on the plans and as specified below.
 - 1. ¾ inch crush rock.
 - 2. Native Materials: Soil native to Project Site, free of wood, organics, and other deleterious substances. Rocks shall not be greater than 3-inches.
 - 3. Sand: Fine granular material, free of organic matter, mica, loam or clay.
 - 4. Lean Mix Concrete: 3 sacks of cement per yard plus sand.
 - 5. Class 2 aggregate base, ¾" rock, per Caltrans Section 26-1.02B
 - 6. Controlled Density Fill: 3 sack slurry backfill.
- B. Water: Furnish all required water for construction purposes, including compaction and dust control. Water shall be potable.
- C. Provide other bedding and backfill materials as described and specified in Section 33 0000, Section 33 4000 and Divisions 22 and 26.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verification of Conditions:
 - 1. Examine areas and conditions under which work is to be performed.
 - 2. Identify conditions detrimental to proper or timely completion of work and coordinate with General Contractor to rectify.

3.2 INSTALLATION

- A. Perform work in accordance with pipe manufacturer's recommendations, as herein specified and in accordance with drawings.

3.3 TRENCHING

- A. Make all trenches open vertical construction with sufficient width to provide free working space at both sides of trench around installed item as required for caulking, joining, backfilling and compacting; not less than 12 inches wider than pipe or conduit diameter, unless otherwise noted.
- B. Carefully excavate around existing utilities to avoid unnecessary damage. The contractor shall anticipate and perform hand work near existing utilities as shown on the survey, without additional claims or cost.
- C. Trench straight and true to line and grade with bottom smooth and free of edges or rock points.

TRENCHING AND BACKFILLING
SECTION 31 2333
3595001000

- D. Where depths are not shown on the plans, trench to sufficient depth to give minimum fill above top of installed item measured from finish grade above the utility as follows:
1. Sewer pipe: depth to vary
 2. Storm drain pipe: depth to vary
 3. Water pipe - Fire Supply: 36 inches
 4. Water pipe – Domestic Supply: 30 inches

3.4 BACKFILL

- A. Pipe Trench Backfill is divided into three zones:
1. Bedding: Layer of material directly under the pipe upon which the pipe is laid.
 2. Pipe Zone: Backfill from the top of the bedding to 6 inches (compacted) over the top of the pipe.
 3. Upper Zone: Backfill between top of Pipe Zone and to surface of subgrade.
- B. Bedding: Type of material and degree of compaction for bedding backfill shall be as defined in the Details and Specifications.
- C. Pipe Zone and Upper Zone Backfill:
1. Type of material and degree of compaction Pipe Zone and Upper Zone Backfill shall be as required by Drawings, Details, & Specifications.
 2. Upper Zone Backfill shall not be placed until conformance of Bedding and Pipe Zone Backfill with specified compaction test requirements has been confirmed.
 3. Backfill shall be brought up at substantially the same rate on both sides of the pipe and care shall be taken so that the pipe is not floated or displaced. Material shall not be dropped directly on pipe.
- D. Backfill Compaction:
1. Backfill shall be placed in layers which, when compacted shall not exceed 6 inches in thickness. Each layer shall be spread evenly and thoroughly mixed to insure uniformity. Do not backfill over, wet, frozen or soft subgrade surfaces. Employ a placement method that does not disturb or damage foundation walls, perimeter drainage, foundation damp-proofing, waterproofing or protective cover.
 2. When moisture content of fill material is below that required to achieve specified density, add water until proper moisture content is achieved. When moisture content is above that required, aerate by blading or other methods until specified moisture content is met; see Section 31 0000, Part 3, Article "Subgrade Preparation".
 3. After each layer has been placed, mixed and spread evenly, it shall be thoroughly compacted to 95% of maximum dry density while at specified moisture content. Compact each layer over its entire area until desired density has been obtained.
 4. Compaction: All backfill operations shall be observed by the Inspector of Record and/or Geotechnical Engineer. Field density tests shall be made to check compaction of fill material. If densities are not satisfactory, Contractor will be

TRENCHING AND BACKFILLING
SECTION 31 2333
3595001000

required to change equipment or procedure or both, as required to obtain specified densities. Notify Inspector and Architect at least 24 hours in advance of any operation.

E. Backfill in Areas Previously Lime or Cement Treated

1. Where trenching occurs in areas that have been lime or cement treated, class 2 aggregate bases or approved controlled density backfill material shall be used for the top 12-inches minimum of the trench or thickness shall match the depth of treated material.

3.5 TRENCH AND SITE RESTORATION

- A. Finished surface of trenches shall be restored to a condition equal to, or better than the condition as existed prior to excavation work.

3.6 PROTECTION

- A. Protect existing surfaces, structures, and utilities from damage. Protect work by others from damage. In the event of damage, immediately repair or replace to satisfaction of Owner.
- B. Repair existing landscaped areas to as new condition. Replant trees, shrubs or groundcover with existing materials if not damaged or with new materials if required. Replace damaged lawn areas with sod, no seeding will be permitted.
- C. Replace damaged pavement with new compatible matching materials. Concrete walks to be removed to nearest expansion joint and entire panel replaced. Asphalt to be cut neatly and replaced with new materials.
- D. Any existing materials removed or damaged due to trenching to be returned to new condition.

3.7 SURPLUS MATERIAL

- A. Remove excess excavated material, unused materials, damaged or unsuitable materials from site.

3.8 CLEANING

- A. Refer to Section 01 7700.
- B. Contractor will keep the work areas in a clean and safe condition so his rubbish, waste, and debris do not interfere with the work of others throughout the project and at the completion of work.
- C. After completion of work in this section, remove all equipment, materials, and debris. Leave entire area in a neat, clean, acceptable condition.

TRENCHING AND BACKFILLING
SECTION 31 2333
3595001000

END OF SECTION

s:\master specifications\division 31 - earthwork\31 2333_trenching and backfilling.docx
Received from WCEI: October 20, 2012; Updated 9-2-21

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Concrete curbs and gutters.
2. Concrete pavement, sidewalks and ramps.
3. Steel reinforcing for flatwork and curbs.
4. Truncated domes.

1.2 RELATED REQUIREMENTS

- A. Section 01 6116, Volatile Organic Compound (VOC) Restrictions; for VOC limits pertaining to adhesives, sealants, fillers, primers, and coatings.
- B. Section 01 8113, Sustainable Design Requirements, for CAL-Green general requirements and procedures
- C. Division 31, Earthwork.
- D. Section 32 1200, Asphalt Concrete Paving.

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CALGreen), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- C. American Concrete Institute (ACI):
1. 117: Specification for Tolerances for Concrete Construction and Materials and Commentary.
 2. 211.1: Standard Practice for Selecting Proportions for Normal, Heavyweight and Mass Concrete.
 3. 301: Specifications for Structural Concrete.
 4. 302.1R: Guide to Concrete Floor and Slab Construction.
 5. 305R: Guide to Hot Weather Concreting.
 6. 306R: Guide to Cold Weather Concreting.
 7. 308R: Guide to External Curing of Concrete.
 8. 318: Building Code Requirements for Structural Concrete and Commentary.
 9. 347R: Guide to Formwork for Concrete.
- D. ASTM International (ASTM):

1. A615/A615M: Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement.
 2. A706/A706M: Standard Specification for Deformed and Plain Low-Alloy Steel Bars for Concrete Reinforcement.
 3. C33/C33M: Standard Specification for Concrete Aggregates.
 4. C94/C94M: Standard Specification for Ready-Mixed Concrete.
 5. C143/C143M: Standard Test Method for Slump of Hydraulic-Cement Concrete.
 6. C150/C150M: Standard Specification for Portland Cement.
 7. C260/C260M: Standard Specification for Air-Entraining Admixtures for Concrete.
 8. C309: Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete.
 9. C330/C330M: Standard Specification for Lightweight Aggregates for Structural Concrete.
 10. C494/C494M: Standard Specification for Chemical Admixtures for Concrete.
 11. C618: Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete.
 12. C920: Standard Specification for Elastomeric Joint Sealants.
 13. C1107/C1107M: Standard Specification for Packaged Dry, Hydraulic Cement Grout (Non-Shrink).
 14. C1315: Standard Specification for Liquid Membrane-Forming Compounds Having Special Properties for Curing and Sealing Concrete.
 15. D1751: Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types).
 16. D5893/D5893M: Standard Specification for Cold Applied, Single Component, Chemically Curing Silicone Joint Sealant for Portland Cement Concrete Pavements.
- E. Concrete Reinforcing Steel Institute (CRSI):
1. Manual of Standard Practice.
 2. Placing Reinforcing Bars.
- F. State of California, Department of Transportation (Caltrans):
1. Division of Engineering Services:
 - a. California Test 342: Method of Test for Surface Skid Resistance with the California Portable Skid Test.
 2. Standard Specifications.
 - a. Section 51, Concrete Structures.
 - b. Section 52, Reinforcement.
 - c. Section 73, Concrete Curbs and Sidewalks.
 - d. Section 90, Concrete.
- G. US Government General Services Administration (GSA/SAE):

1. GSA/SAE AMS-STD-595A: Colors Used In Government Procurement.

1.4 ADMINISTRATIVE REQUIREMENTS

A. Submittal Procedures:

1. Action Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
3. Sustainable Design Submittals shall comply with the additional requirements of Section 01 8113, Sustainable Design Requirements.

1.5 ACTION SUBMITTALS

A. Shop Drawings: Joint pattern layout for walks and pavement.

B. Product Data:

1. A complete list of materials proposed to be used for the site concrete work including, but not limited to, sand, gravel, admixtures, surface treatments, coloring agents, sealers, cast-in-place accessories, forming and curing products, concrete mix designs, reinforcing materials, joint materials, curing materials, and detectable warning surface.
2. Manufacturer's descriptive literature for products proposed for use. Include installation instructions, and maintenance instructions.

C. Concrete Mix Design: The Contractor shall submit three copies of each proposed mix design for each class of concrete in accordance with ACI 301, Sections 3.9 "Proportioning on the Basis of Previous Field Experience or Trial Mixture," or 3.10 "Proportioning Based on Empirical Data." The Contractor shall submit a separate mix design for concrete to be placed by pumping, in addition to the mix design for concrete to be placed directly from the truck chute.

1. The following information shall be included in the concrete mix design:
 - a. Proportions of cement, fine and coarse aggregate, and water.
 - b. Water-cement ratio, 28-day compressive design strength, slump, and air content.
 - c. Type of cement and aggregate.
 - d. Special requirements for pumping.
 - e. Range of ambient temperature and humidity for which design is valid.
 - f. Special characteristics of mix, which require precautions in mixing, placing, or finishing techniques to achieve specified finished product.
2. Do not begin concrete production until mixes have been reviewed and approved by Engineer.
 - a. Review of mix design by the Architect and Engineer shall in no way relieve the subcontractor of his responsibility for the performance of the concrete.

D. Qualification Data: For manufacturer

- E. Delivery tickets as specified for ready-mixed concrete.
- F. Sustainable Design:
 - 1. General:
 - a. Submit information necessary to establish and document compliance with the California Green Building Standards Code.
 - b. Sustainable design submittals are in addition to other submittals.
 - 2. The following information shall be provided:
 - a. Adhesives and Sealants: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.
 - b. Paints and Coatings: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.

1.6 CLOSEOUT SUBMITTALS

- A. Guarantee: Submit subcontractor's guarantee.

1.7 QUALITY ASSURANCE

- A. Qualifications:
 - 1. Manufacturer of ready-mixed concrete products shall meet ASTM C94/C94M requirements for production facilities and equipment.
- B. Design, erect, support, brace and maintain formwork and shoring to safely support all loads that might be applied until such loads can be carried by concrete.
- C. The Contractor shall perform work in accordance with ACI 301.
- D. Use only new materials and products.
- E. Single-Source Responsibility: Use materials and products of one manufacturer whenever possible.
- F. Materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.
- G. Testing to determine compliance with the work of this Section will be the responsibility of the Contractor.
 - 1. Cement and reinforcing shall be tested in accordance with CBC Section 1910A. Testing of reinforcing may be waived in accordance with Section 1910A.2 when approved by the Engineer and DSA.
 - 2. Testing will be performed by an independent testing and inspecting agency in accordance with Section 01 4523, Testing and Inspection Services, and paid for by the Owner.
 - 3. Refer to Article FIELD QUALITY CONTROL in Part 3 of this Section for additional requirements.

4. Cost of retests and coring due to low strength or defective concrete will be paid by the Owner and back-charged to the Contractor.
- H. Sieve analysis from testing laboratories identifying rock/sand percentages within the concrete mix; or class 2 aggregate base shall have the current Project name and Project location identified on the report. Outdated analytical reports greater than 90 days old will not be accepted.
- I. Mockups: Provide on-site mockup panels for each type of exposed colored concrete flatwork showing texture and color before proceeding with finish to be used on this Project.
 1. Construct sample panels after review and approval of samples.
 2. Size: Minimum 5 feet square and have at least one longitudinal and one transverse joint unless a more specific note indicates otherwise on Drawings.
 3. Construct sample panels at location approved by Architect.
 4. Construct sample panels in ample time to allow for finishing and curing before requesting Architect to review.
 5. Follow procedures used on accepted samples.
 6. Include saw-cut and tooled joints to match method and appearance proposed for use in completed work.
 7. Prepare successive sample panels as required until finish, color, and appearance is approved by Architect.
 8. Do not remove sample panels until authorized in writing by the Architect and all concrete work has been approved.

1.8 DELIVERY, STORAGE AND HANDLING

- A. Deliver undamaged products to job in manufacturer's sealed containers and/or original bundles with tags and labels intact.
- B. Store materials in protected, dry conditions off of ground and in areas so as to not interfere with the progress of the Work.
- C. Transport, store and handle in strict accordance with the manufacturer's written recommendations.
- D. Store cement in weather tight building, permitting easy inspection and identification. Protect from dampness. Lumpy or stale cement will be rejected.
- E. Aggregates: Prevent excessive segregation, or contamination with other materials or other sizes of aggregate. Use only one supply source for each aggregate stock pile.

1.9 FIELD CONDITIONS

- A. Make and be responsible for all field dimensions necessary for proper fitting, slopes, and completion of work. Report discrepancies to Architect before proceeding.
- B. Do not place concrete during rain without adequate protection.

- C. The Contractor shall conform to ACI 306R when mixing and placing concrete during cold weather. Provide sufficient protection when daily temperatures drop below 40 degrees F.
- D. The Contractor shall conform to ACI 305R when mixing and placing concrete during hot weather. When air temperature exceeds 100 degrees F adjust concrete mix with retarding admixture in design mix, and adequately test and take additional measures as directed by concrete supplier.
- E. The Contractor shall maintain access for vehicular and pedestrian traffic as required for other construction activities. Use temporary striping, flagmen, barricades, warning signs, and warning lights as required.
- F. Placing in hot weather: Comply with ACI 305R. Concrete shall be delivered, placed and finished in a sufficiently short period of time to avoid surface dry checking.
 - 1. Concrete shall not exceed 85 degrees F at time of placement.
 - 2. Concrete shall be kept wet continuously after tempering until implementation of curing compound procedure in accordance with this specification.
 - 3. Evaporation Retarder: Apply evaporation retarder to concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 pounds per square foot per hour, before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.
- G. Placing in Cold Weather: Comply with ACI 306R. Protect from frost or freezing. No antifreeze admixtures are permitted.
 - 1. When placing concrete during freezing or near-freezing weather, mix shall have temperature of at least 50 degrees F but not more than 90 degrees F.
 - 2. Concrete shall be maintained at temperature of at least 50 degrees F for not less than 72 hours after placing or until it has thoroughly hardened.
 - 3. Provide necessary thermal coverings for any flat work exposed to freezing temperatures.

PART 2 - PRODUCTS

2.1 DESIGN AND PERFORMANCE CRITERIA

- A. Contractor shall comply with requirements applicable to this Section for concrete materials, admixtures, bonding materials, curing materials, surface sealers and others as required.
- B. Concrete walking surfaces shall have a coefficient of friction not less than 0.30 and will be subject to testing to verify compliance as specified in Article FIELD QUALITY CONTROL.
 - 1. The coefficient of friction will be measured by California Test 342 before pavement is opened to public traffic, but not sooner than 7 days after concrete placement.

2. Contractor shall notify the Architect and Project Inspector of pavement having a coefficient of friction less than 0.30.
- C. Sustainable Design:
1. VOC emissions for field-applied adhesives, sealants, and sealant primers must comply with limits specified in Section 01 6116.
 2. VOC emissions for field-applied paints and coatings must comply with limits specified in Section 01 6116.

2.2 FORMING MATERIALS

- A. Form Material: Steel, wood, or other suitable material of size and strength to resist movement during concrete placement and to retain horizontal and vertical alignment until removal. Use straight forms, free of distortion and defects. Use flexible spring steel forms or laminated boards to form radius bends as required. The forms shall be of a depth equal to the depth of curbing or sidewalk, and so designed as to permit secure fastening together at the tops. Coat forms with non-staining type coating that will not discolor or deface surface of concrete.
1. Concrete Exposed to View: 5/8-inch minimum APA B-B Plyform, steel or "Sonotube" forms by Sunoco, 888-875-8754, or equal.
 2. Concrete Concealed from View: 5/8-inch minimum APA B-B Plyform, steel or 1 x 8 DF, Number 2 Grade or better.
- B. Form Ties: Snap off metal of fixed length, leaving no metal within 1-1/2 inches of surface and no fractures, spalls or other surface defects larger than 1 inch diameter; manufactured by Burke, Dayton Superior, or equal.
- C. Spreaders: Metal. Wood is not permitted.
- D. Form Coating: Coat forms with non-staining material that will not discolor or deface surface of concrete or leave any residue on concrete that would interfere with surface coating as approved by the Architect.
- E. Chamfer Strips: Rigid polyvinyl chloride, 3/4-inch x 3/4-inch, in maximum possible lengths, manufactured by Burke, Greenstreak, Vulco, or equal.

2.3 REINFORCING MATERIALS

- A. Reinforcement Bars: New billet steel deformed bars conforming to requirements of ASTM A615/A615M or ASTM A706/A706M; Grade 60.
1. Bars for dowels installed through expansion joints or construction joints to existing sidewalks or concrete features shall be smooth or if deformed shall be sleeved on one end for slippage.
- B. Reinforcing Supports: Galvanized metal chairs or spacers or metal hangers, accurately placed 3 feet on center each way, staggered, with each support securely fastened to steel reinforcement in place.

1. Bottom bars in footings may be supported with 3-inch concrete blocks with embedded wire ties.
2. Concrete supports without wire ties will not be allowed.

2.4 CONCRETE MATERIALS

- A. Cement: Portland cement in accordance with ASTM C150/C150M, Type II, low alkali.
- B. Concrete Aggregates: Graded from coarse to fine in accordance with ASTM C33/C33M.
 1. Normal Weight Aggregates: Clean and free from deleterious coatings, clay balls, roots, and other extraneous materials, and in conformance with ASTM C33/C33M, except as otherwise specified. Combined grading shall meet limits of ASTM C33/C33M.
 - a. Size: Not be larger than one-fifth of the narrowest dimension between forms, or larger than three-fourths of the minimum clear spacing between reinforcing bars.
 2. Lightweight Aggregates:
 - a. General: Durable particles suitably processed, washed and screened without adherent coatings, free of materials with deleterious reactivity to alkali in cement, and conforming to ASTM C330/C330M.
 - b. Fine aggregate shall be natural sand, or sand prepared from stone or gravel, with grains free of silt, loam and clay.
- C. Water: Potable, clean, and in accordance with ASTM C94/C94M, free from injurious amounts of oil, acids, alkalis, salts, scale, organic materials or other deleterious matter, and in compliance with ACI 318 Section 26.4.1.3.
- D. Fly Ash: Western Fly Ash, conforming to ASTM C618 for Class N or Class F materials and in accordance with CBC Section 1903A.6.
 1. Class C is not permitted.
 2. Proportions: Not more than 15 percent (by weight) may be substituted for portland cement.

2.5 ADMIXTURES

- A. Water Reducing Admixture: Admixture to improve placing, reduce water cement ratio and ultimate shrinkage; "WRDA 64" by GCP Applied Technologies, or equal conforming to ASTM C494/C494M and ACI 318 Section 3.6.
 1. Water reducing admixture may be used subject to prior approval by the Architect, Engineer, and the Testing Lab.
 2. Proposed product and quantity shall be included in original design mix.
- B. Air-Entraining Admixture: "Daravair 1000" by GCP Applied Technologies or equal conforming to ASTM C260 and ACI 318, section 26.4.1.4.
 1. Proportion air entraining concrete to attain specified minimum 28-day compressive strength.

2. Total air entrainment in concrete shall be not less than 4 percent or more than 6 percent of the volume of concrete.
- C. Glare Reduction Colorant: Concentrated pigment dispersions designed to permanently color concrete; "Chromix L10 Base-Black" by Sika Corporation, or equal. *Was within 2.2 H.1*

2.6 CURING MATERIALS

- A. Clear Curing Compound: Water-based membrane-forming concrete curing compound in accordance with ASTM C309 and C1315; "Aqua Resin Cure Clear" by Burke CO, "1100" by W.R. Meadows, or equal.

2.7 ADDITIONAL MATERIALS AND COMPONENTS

- A. Concrete Bonding Agent: The following, or equal, conforming to ASTM C1059/C1059M.
 1. "Weld-Crete" by Larson Products Corporation, 800-633-6668.
 2. "Daraweld C" by GCP Applied Technologies, 877-423-6491.
- B. Patching Mortar: One-component, trowel applied, migrating-corrosion-inhibitor enhanced, polymer-modified, shrinkage-compensated, fiber reinforced, micro-silica enhanced, cementitious repair mortar for horizontal, vertical, and overhead applications; "Meadow-Crete GPS" by W.R. Meadows, or equal.
- C. Non-Shrink Grout: Premixed, non-metallic, no chlorides, non-staining and non-shrinking conforming to ASTM C1107/C1107M; "MasterFlow 713" by Master Builders Solutions, a division of BASF, 800-433-9517, or equal.
- D. Drainage Rock Base: 3/4-inch aggregate size conforming to Class 2 Aggregate Base as defined in Caltrans Standard Specifications Section 26, or equal clean free-draining gravel or crushed rock as recommended by the Geotechnical Engineer.
- E. Expansion Joint Material: Preformed 3/8-inch fiber material, with bituminous binder manufactured for use as concrete expansion joint material and conforming to ASTM D1751 and approved by Architect.
 1. Furnish joint fillers in one-piece lengths for full width being placed, wherever possible. Where more than one length is required, lace or clip joint-filler sections together.
- F. Joint Sealant for Expansion Joints in Concrete: Weather and UV resistant, single component, cold applied silicone sealant, Type S, conforming to ASTM D5893/D5893M; ASTM C920, Grade P, Class 25, Use T.
 1. Self-Leveling: "DOWSIL 890-SL Silicone Joint Sealant" by Dow Chemical Company, or equal.
 2. At Slopes Exceeding 5 Percent: Non-sagging; "DOWSIL 888 Silicone Joint Sealant" by Dow Chemical Company, or equal.
 3. Color: As standard with manufacturer.

- G. Pre-Formed Plastic Expansion Joint Caps: Polystyrene, with removable tops; "Snap Cap" by W. R. Meadows, Tex-Trude expansion caps, or equal.
- H. Truncated Domes: Vitrified Polymer Composite (VPC) cast-in-place detectable/tactile warning surface tiles complying with Americans with Disabilities Act (ADA) and the California Code of Regulations (CCR) Title 24, Part 2, Chapter 11B; "Armor-Tile", "Access Tile Tactile Systems," or equal.
 - 1. Color: Shall be yellow and approximate 33538 of GSA/SAE AMS-STD-595A in accordance with CBC Section 11B-705.1.1.3.1.
- I. Traffic Paint for Accessibility Striping at Stairs: VOC compliant, water-based, vinyl acrylic copolymer fast drying emulsion and specifically formulated as a traffic marking paint; "Setfast" with "Duckback" abrasive additive by Sherwin-Williams, "SAFE-STRIDE" by Wooster Products, Inc., or equal.
 - 1. Colors: As selected by Architect. [Yellow]
- J. Cast Abrasive Accessibility Strips and Stairs: Extruded aluminum with integral anchor and filled with abrasive granules in epoxy binder; Model ST-SF-N by Nystrom, Inc., 800-547-2635, Type T-24 by American Safety Tread Company, Inc., 800-245-4881, Type WP-24A by Wooster Products, Inc., 330-264-2844, or equal.
 - 1. Colors: As selected by Architect. [Yellow]

2.8 CONCRETE DESIGN AND CLASS

- A. Designed Strength and Classes of Concrete: The following mixes are not applicable to concrete items exceeding 4 feet in height above the adjacent grade.
 - 1. Class "B": Concrete shall have 1 inch maximum size aggregate, shall have 3000 pounds per square inch minimum at 28 day strength with a maximum water to cementitious ratio no greater than 0.50.
 - a. Location of Use: Exterior slabs, including walks, vehicular paved surfaces, manhole bases, poured-in-place drop inlets, curbs, valley gutters, curb and gutter, and other concrete of like nature.
 - 2. Class "D" concrete of 1 inch maximum size aggregate shall have 3500 pounds per square inch 28 day strength with a maximum water to cementitious materials ratio of 0.55.
 - a. Location of Use: Footings and retaining walls not attached to buildings, and planter walls, monument signs, and other site concrete not described for use in Class "B".
- B. Slump Limits: Provide concrete, at point of final discharge of proper consistency as tested in accordance with ASTM C143/C143M with slumps of 4 inches, plus or minus 1 inch.
- C. Mix Design: Concrete shall be designed for strength in accordance with provisions of CBC Section 1905A.

1. Should the Contractor desire to pump concrete, a modified mix design will need to be submitted for review.
 2. Fly ash may be used in concrete to improve workability in amounts up to 15 percent of the total cementitious weight.
- D. Air Entrainment: Provide at concrete paving / flatwork, including concrete ramps and stairs in accordance with local jurisdiction minimum requirements, but no less than 3 percent of the volume of concrete.
- E. Glare Reduction Additive:
1. General:
 - a. Provide at exterior concrete slabs, walks, ramps, stairs, including bleachers, and other exposed flatwork to eliminate glare.
 - b. Omit glare reduction colorant where color hardener, integral color, and stain treatment of concrete are scheduled.
 2. Quantity: As required to match approved sample but not exceed 2 pounds of colorant per cubic yard of concrete.
 3. Add colorant to mix in accordance with manufacturer's printed instructions.
- F. Coloring Agent:
1. Quantity: Add pigment as required to result in hardened concrete color consistent with approved sample but not exceeding maximum dosage per sack of cement as recommended by manufacturer based on total cementitious materials of mix design.
 2. Add pre-mixed colorant bags to mix in accordance with manufacturer's printed instructions.

2.9 MIXING OF CONCRETE

- A. Conform to requirements of CBC Chapter 19A.
- B. Concrete shall be mixed until there is uniform distribution of material and mass is uniform and homogenous; mixer must be discharged completely before the mixer is recharged.
- C. Concrete shall be Ready-Mixed Concrete: Mix and deliver in accordance with the requirements set forth in ASTM C94/C94M and ACI 301. Batch Plant inspection may be waived in accordance with CBC Section 1705A.3.3, when approved by the Project Engineer and DSA.
1. Furnish batch certificates for each batch discharged and used in the work.
 2. Approved Testing Laboratory shall check the first batching at the start of the work and furnish mix proportions to the Licensed Weighmaster.
 3. Licensed Weighmaster shall identify materials as to quantity and to certify to each load by ticket.
 4. Delivery tickets are to accompany each truck and shall be kept in the job superintendent's file. Delivery tickets must indicate the following information or be subject to rejection:

- a. Name of Project.
 - b. Supplier of concrete.
 - c. Truck identity and ticket serial number.
 - d. Date of delivery.
 - e. Brand of cement.
 - f. Cement content.
 - g. Strength classification.
 - h. Batching time.
 - i. Point of deposit.
 - j. Total amount of water.
 - k. Weight of aggregate.
 - l. Daily temperature.
 - m. Number of cubic yards in load.
 - n. Admixture content.
 - o. Name of Contractor.
 - p. Name of driver.
 - q. Time loaded and first mixing of concrete.
 - r. Reading of revolution counter.
 - s. Color additive.
5. Ticket shall be transmitted to Project Inspector by truck driver with load identified thereon. Project Inspector will not accept load without load ticket identifying mix and will keep daily record of pours, identifying each truck, its load and time of receipt, and will transmit two copies of record to DSA.
6. At end of project, Weighmaster shall furnish affidavit to DSA on form satisfactory to DSA, certifying that all concrete furnished is in conformance with proportions established by mix designs.
7. Placement of concrete shall occur as rapidly as possible after batching and in a manner which will assure that the required quality of the concrete is maintained. In no case may concrete be placed more than 90 minutes from batch time.
- a. When air temperature is between 85 and 90 degrees F, reduce maximum batching to discharge time from 90 minutes to 75 minutes.
 - b. When air temperature is above 90 degrees F, reduce maximum batching to discharge time to 60 minutes.
8. Water may be added to the mix only if neither the maximum permissible water-cement ratio nor the maximum slump is exceeded.
- a. The quantity of water used for each batch shall be accurately measured.
 - b. In no case shall more than 10 gallons of water be added to a full 9-yard load, or 1 gallon per yard on remaining concrete within the drum, providing load tag indicates at time of mixing at plant an allowance for additional water.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Confirm general layout, grade, and joint pattern layout with the Architect prior to placing concrete.
- B. Verify that gradients and elevations of the base are correct, and that the base is dry.
- C. Contractor shall report in writing to the Architect prevailing conditions that will adversely affect satisfactory execution of the work of this Section.
 - 1. Do not proceed with work until unsatisfactory conditions have been corrected.
- D. Forms and reinforcements are subject to approval by the Project Inspector as specified in Article FIELD QUALITY CONTROL.

3.2 PREPARATION

- A. Remove frost, water, and other foreign materials from form surfaces, reinforcement, and embedded items against which concrete will be placed.
- B. When the ambient temperature necessitates the use of cold or hot weather concreting, make provisions in advance of concrete placement.
- C. Before placing concrete, clean tools and equipment, and remove debris from areas to receive concrete.
- D. Clean reinforcing and other embedded items of coatings, oil, mud and soil that may impair bond with concrete.
- E. Slab-On-Grade: After subgrade has been approved by Geotechnical Engineer, install specified drainage rock base material to thickness shown. Rock base shall be implemented and compacted in accordance with the Geotechnical Report and recommendations of the Geotechnical Engineer.

3.3 INSTALLATION – FORMWORK

- A. Form material shall be straight, true, sound and able to withstand deformation due to loading and effects of moist curing. Materials which have warped or delaminated, or require more than minor patching of contact surfaces, shall not be reused.
- B. Build forms to shapes, lines, grades and dimensions indicated. Construct formwork to maintain tolerances required by ACI 301. Forms shall be substantial, tight to prevent leakage of concrete, and properly braced and tied together to maintain position and shape. Butt joints tightly and locate on solid backing. Chamfer corners where indicated. Form bevels, grooves and recesses to neat, straight lines. Construct forms for easy removal without hammering, wedging or prying against concrete.
- C. Space clamps, ties, hangers and other form accessories so that working capacities are not exceeded by loads imposed from concrete or concreting operations.

- D. Build openings into vertical forms at regular intervals if necessary to facilitate concrete placement, and at bottoms of forms to permit cleaning and inspection.
- E. Build in securely braced temporary bulkheads, keyed as required, at planned locations of construction joints.
- F. Before placement of reinforcing steel, coat faces of all forms to prevent absorption of moisture from concrete and to facilitate removal of forms. Apply specified material in conformance with manufacturer's written directions.
 - 1. Seal all cut edges.
 - 2. Before re-using form material, inspect, clean thoroughly, and recoat.
- G. Slope tie-wires downward to outside of wall.
- H. Brace, anchor and support all cast-in items to prevent displacement or distortion.
- I. During and immediately after concrete placing, tighten forms, posts and shores. Readjust to maintain grades, levels and camber.
- J. Concrete Paving, Curbs, Curb and Gutters, Ramps:
 - 1. Expansion Joints: Install at locations indicated, and so that maximum distance between joints is 20 feet for exterior concrete unless otherwise shown. Expansion joint material shall be full depth of concrete section. Recess for snap cap and sealant when required.
 - 2. Curbs, Valley Gutter, and Curb & Gutter: Install expansion joints at 60 feet on center, except when placing adjacent to concrete walks, the expansion joints shall align with the expansion joints shown for the concrete walks. Expansion joint material shall be full depth of concrete section. Recess for snap cap and sealant when required.
 - 3. Isolation Joints: 3/8-inch felt between walls and exterior slabs or walks so that paved areas are isolated from all vertical features, unless specifically noted otherwise on plans.
 - 4. Exterior Concrete Paving: Install expansion joints at 20 feet on center maximum, both directions, unless shown otherwise on plans.
 - 5. Ramps: Whether shown or not, all ramps shall have control joints and expansion joints.
 - a. Control joints on ramps shall be aligned and placed in between the vertical posts for the handrails. The curbs, if required shall have control joints that align with the handrail posts.
 - b. Expansion joints shall be placed at the upper, intermediate, and bottom landings.
- K. Inspection: Refer to Article FIELD QUALITY CONTROL.

3.4 INSTALLATION – REINFORCING

- A. General: Reinforcing shall be accurately placed at locations indicated on the drawings within required tolerances and providing required clearances. Reinforcement shall be

secured prior to placement of concrete such that tolerances and clearances are maintained. Coverage shall be in accordance with Section 1907A.7 of the CBC.

1. Reinforcement must be in place before concreting is begun.
 2. Keep a person on the job to maintain position of reinforcing as concrete is placed.
 3. All expansion and construction joints in concrete shall have dowels of size and spacing as shown on the Drawings, or as approved by Architect.
 4. Give notice whenever pipes, conduits, sleeves, and other construction interferes with placement; obtain method of procedure to resolve interferences.
- B. Additional reinforcing steel shall be placed around all utility boxes, valve boxes, manhole frames and covers that are located within the concrete placements.
1. The bars shall be placed so that there will be a minimum of 1-1/2-inch clearance and a maximum of 3-inch clearance. The reinforcing steel shall be placed mid-depth of concrete slab.
- C. At right angles or intersections of concrete walks, additional 2 feet x 2 feet #5, 90 degree bars shall be added at all inside corners for additional crack control. The bars shall be placed 2 inches from concrete forms and supports, at mid-depth of slab.
- D. Reinforcing steel shall be adequately supported by approved devices on centers close enough to prevent any sagging.
- E. Placing Tolerances:
1. In accordance with ACI 301 or CRSI/WCRSI Recommended Practice for Placing Reinforcing Bars, unless otherwise shown.
 2. Clear distance between parallel bars in a layer shall be no less than 1 inch, the maximum bar diameter shall not exceed 1-1/2 times the maximum size of coarse aggregate.
- F. Splices:
1. General: Unless otherwise shown on drawings, splice top reinforcing at midspan between supports, splice bottom reinforcing at supports, and stagger splices. Bar laps shall be wired together. Reinforcing steel laps shall be as follows:
 - a. Length of Lap Splices in Concrete:
 - 1) No. 4 bar: 24 inches minimum.
 - 2) No. 5 Bar: Not less than 62 bar diameters.
 - 3) No. 6 Bar: 56 inches minimum.
 - 4) No. 7 Bars and Larger: Not less than 93 bar diameters.
 - b. All splices shall be staggered at 5 feet minimum from adjacent splices.
- G. Inspection: Refer to Article FIELD QUALITY CONTROL.

3.5 PLACING OF CONCRETE – GENERAL

- A. Adjacent finish surfaces shall be protected at all times during the concrete pour and finishing. Verify that all formwork is tight and leak-proof before concrete is poured. Finish work defaced during the concrete pour and finishing shall be replaced at no extra cost to Owner.
- B. Remove wood chips, sawdust, dirt, loose concrete and other debris just before concrete is to be poured. Use compressed air for inaccessible areas. Remove all standing water from excavations.
- C. Transport concrete from mixer to place of final deposit as rapidly as practicable by methods which will prevent separation or loss of ingredients. Deposit as close as practicable in final position to avoid re-handling or flowing. Partially hardened concrete must not be deposited in work. Concrete shall not be wheeled directly on top of reinforcing steel.
- D. Keep excavations free of standing water, but moisture condition sub-grade before concrete placement.
- E. Placing: Once started, continue concrete pour continuously until section is complete between predetermined construction joints. Prevent splashing of concrete onto adjacent forms or reinforcement and remove such accumulation of hardened or partially hardened concrete from forms or reinforcement before work proceeds in that area. Free fall of concrete shall not to exceed 4'-0" in height. If necessary, provide lower openings in forms to inject concrete and to reduce fall height.
- F. Remove form spreaders as placing of concrete progresses.
- G. Place footings as monolithic and in one continuous pour.
- H. Compacting: Concrete shall be compacted by mechanical vibrators.
 - 1. Concrete shall be thoroughly worked around reinforcement and embedded fixtures and into corners of forms.
 - 2. Vibrating shall not be applied to concrete which has already begun to initially set or be continued so long as to cause segregation of materials.

3.6 REMOVAL OF FORMS

- A. Remove without damage to concrete surfaces.
 - 1. Sequence and timing of form removal shall insure complete safety of concrete structure.
 - 2. Forms shall remain in place for not less than the following periods of time. These periods represent cumulative number of days during which temperature of air in contact with concrete is 60 degrees F and above.
 - a. Vertical Forms of Foundations, Walls and All Other Forms Not Covered Below: 5 days.
 - b. Concrete Paving Edge Screeds or Forms: 7 days.

3. Concrete shall not be subjected to superimposed loads (structure or construction equipment) until it has attained its full design strength and not for a period of at least 21 days after placing. Concrete systems shall not be subjected to construction loads in excess of design loads.
- B. Patching: Install specified patching mortar per manufacturer's recommendations. Repairs to defective concrete which affect the strength of any structural concrete member or component are subject to approval by the architect and DSA.

3.7 CONCRETE PAVING

- A. Concrete paving shall be formed and finished to required line and grades true and flat with a maximum tolerance of 1/8-inch in 10 feet for flatness and to slopes indicated.
- B. Concrete vibrator shall be used to assist concrete placement. Contractor shall have spare concrete vibrator on site during concrete placement.
- C. Thoroughly water and soak the subgrade of exterior concrete paving, curbs, curb and gutters, with multiple daily waterings for at least three days or as required to achieve required moisture content prior to the concrete pour in order to place the subgrade soils in full expansion.
 1. Provide damming as required to keep standing water within the formed area and to allow for proper saturation and full expansion of the subgrade soils.
 2. Remove standing water before concrete placement.
- D. Construction Joints:
 1. Keep exposed concrete face of construction joints continuously moist from time of initial set until placing of concrete; thoroughly clean contact surface by chipping entire surface not earlier than 5 days after initial pour to expose clean hard aggregate solidly embedded, or by approved method that will assure equal bond, such as green cutting.
 2. If contact surface becomes contaminated with soil, sawdust or other foreign matter, clean entire surface and re-chip entire surface to assure proper adhesion.

3.8 FINISHING

- A. Concrete Paving: Finish surface as required by ACI 302.1R using manual and vibrating screeds to place concrete level and smooth.
 1. Under no circumstances shall water be added to the top surface of freshly placed concrete.
 2. Use "jitterbugs" or other special tools designed for the purpose of forcing the course aggregate below the surface leaving a thick layer of mortar 1 inch in thickness.
 3. After tamping the concrete, wood float surface to a true and even plane.
 4. After floating with a wood bull float, make 2 passes with a steel Fresno trowel to start sealing the concrete surface.

5. While concrete is still wet but sufficiently hardened to bear a persons' weight on knee boards, start troweling with a steel hand trowel or a machine trowel in larger areas. Use sufficient pressure to bring moisture to surface.
 6. After surface moisture has disappeared, finish concrete utilizing steel, hand or power trowel.
 7. Completed surface shall be free from trowel marks, depressions, ridges or other blemishes. Tolerance for flatness shall be 1/8-inch in 10 feet.
 8. Provide final finish as follows, unless otherwise indicated:
 - a. Medium Broom Finish: Typical finish to be used at all exterior walks, stairs and ramps. Brooming direction shall run perpendicular to slope to form non-slip surface.
- B. Curb Finish: Steel trowel.
- C. Joints and Edges:
1. Mark-off exposed joints, where indicated, with 1/4-inch radius x 1 inch deep jointer or edging tool. Joints shall be clean, cut straight and parallel or square with respect to concrete walk edge.
 2. Tool edges of control joints, walk edges, and wherever concrete walk adjoins other material or vertical surfaces. Expansion joints shall be constructed as detailed on plans.
 3. The expansion joints shall be full depth as shown in the Drawings. Failure to do so will result in non-compliance and shall be immediately machine cut by the Contractor at its expense.

3.9 CURING

- A. Formed Concrete:
1. Keep forms and top on concrete between forms continuously wet until removal of forms, 7 days minimum.
 2. Maintain exposed concrete in a continuous wet condition for 14 days following removal of forms.
- B. Concrete Paving, Curb, Curb and Gutter, Valley Gutter:
1. Cure utilizing curing compound. If applicable, the Contractor shall verify that the approved curing compound is compatible with the approved colorant system.
 2. Curing compound shall be applied in a wet puddling application. Spotty applications shall be reason for rejection and possibly concrete removal and replacement at the contractor's expense with no compensation from the Owner.
- C. No curing compound shall be applied to areas scheduled to receive resilient track surface including, curbs, ramps, runways, and similar items.

3.10 DEFECTIVE CONCRETE

- A. General:

1. Determination of defective concrete shall be made by the Architect or Engineer whose opinion shall be final in identifying areas to be replaced, repaired or patched.
2. As directed by Architect, cut out and replace defective concrete.
 - a. Defective concrete shall be removed from the site.
 - b. No patching is to be done until surfaces have been examined by Architect and permission to begin patching has been provided.
 - c. Permission to patch an area shall not be considered waiver of right by the Owner to require removal of defective work, if patching does not, in opinion of Architect, satisfactorily restore quality and appearance of surface.
 - d. Remove and replace concrete if repair to an acceptable condition is not feasible.

B. Defective Concrete Is:

1. Concrete that does not match the approved mix design for the given installation type.
2. Concrete not meeting specified 28-day strength.
3. Concrete which contains rock pockets, voids, spalls, transverse cracks, exposed reinforcing, or other such defects which adversely affect strength, durability or appearance.
4. Concrete which is incorrectly formed, out of alignment or not plumb or level, or outside of the maximum tolerance for flatness and slopes indicated.
5. Concrete containing embedded wood or debris.
6. Concrete having large or excessive patched voids which were not completed under Architect's direction.
7. Concrete not containing required embedded items.
8. Concrete with excessive shrinkage, transverse cracking, crazing, curling; or defective finish.
9. Concrete that is unsuitable for placement or has set in truck drum for longer than 90 minutes from the time it was batched.
10. Concrete where expansion joint filler that is not isolating the full depth of the concrete section, and not recessed as required for backer rod and sealant where required.
11. Concrete that is excessively wet or excessively dry and will not meet the minimum or maximum slump required per mix design.
12. Finished concrete with oil stains from equipment use, and or rust spots that cannot be removed.
13. Concrete with control joints (weakened planed joints) that do not meet the required minimum depth shown on the drawings.
14. Concrete not meeting slip-resistance requirements.

C. Flatwork: The Owner reserves the right to survey the flatwork, to determine if flatwork is outside of the maximum tolerance for flatness and slopes as indicated.

1. If the flatwork is found to be out of tolerance, then the Contractor is required to replace concrete at no additional expense to the Owner.
2. Determination of flatwork flatness, surveying and remedial work must be completed far enough in advance so that the project schedule is maintained, delays are avoided, and the new flatwork or flatwork repairs are properly cured.
3. The Contractor will be responsible for reimbursing the Owner for costs associated with re-surveying to verify compliance of work remediated by the Contractor.

3.11 SEALANT

- A. Apply sealant in compliance with manufacturer's instructions, using hand guns or pressure equipment with proper nozzle size, on clean, dry, properly prepared substrates.
- B. Force sealants into joint against sides of joint to make uniform. Avoid pulling of the sealant from the sides. Fill sealant space completely with sealant.
- C. Finished joints shall be straight, uniform, smooth, and neatly finished.
- D. Remove any excess sealant from adjacent surfaces of joints utilizing the manufacturer's recommended solvent and cleaning processes. Leave the work in a neat, clean condition.

3.12 FIELD QUALITY CONTROL

- A. Inspection of Forms and Reinforcing:
 1. Approval of forms and reinforcing steel must be received from Project Inspector prior to pouring concrete.
 2. Notice of readiness to place first pour shall be given to Project Inspector, DSA, Architect, and Engineer not less than 48 hours prior to placement of concrete to allow for inspection.
 3. Pouring of concrete shall not proceed prior to completing requested adjustments to forms and reinforcing and without approval of Project Inspector.
- B. Testing of Concrete:
 1. Frequency and Samples for Testing:
 - a. Four identical cylinder samples for strength tests of each class of concrete placed each day shall be taken not less than once a day, or not less than once for each 50 cubic yards of concrete, or not less than once for each 2,000 square feet of surface area for slabs or walls.
 - b. In addition, samples for strength tests for each class of concrete shall be taken for seven-day tests at the beginning of the concrete work or whenever the mix or aggregate is changed.
 2. Testing:
 - a. Slump: Each truck's concrete shall be tested for slump before concrete is placed.
 - b. Strength:

- 1) Tests for strength will be conducted by Testing Agency on one cylinder at 7 days and two cylinders at 28 days. The fourth remaining cylinder will be available for testing at 56 days if the 28-day cylinder test results do not meet the required design strength.
 - 2) On a given project, if the total volume of concrete is such that the frequency of specified testing would provide less than five strength tests for a given class of concrete, tests shall be made from at least five randomly selected batches or from each batch if fewer than five batches are used.
- C. Slip-Resistance Testing: Owner's Testing Agency will perform testing on flatwork to verify compliance with specified slip-resistance.
1. The coefficient of friction will be measured by California Test 342 before pavement is opened to public traffic, but not sooner than 7 days after concrete placement
 2. Where paving is determined to have a coefficient of friction less than 0.30, Contractor is to repair and/or replace these surfaces at no cost to Owner.

3.13 CLEANING

- A. Upon completion of work of this Section promptly remove from the working area all scraps, debris and surplus material of this Section.
- B. Clean excess material from surface of all concrete walks and utility structures.
- C. Power wash concrete surfaces to remove stains, dried mud, tire marks, and rust spots.
- D. Comply with any additional requirements of additive manufacturer for colored concrete.

3.14 PROTECTION

- A. Graffiti-resistant Coating:
 1. Surface Preparation: Prepare concrete surface to receive graffiti-resistant coating specified in Section 09 9623, Graffiti-Resistant Coatings, where indicated.
 2. Concrete must be clean, dry, and free of efflorescence and dust.
- B. Protect work and materials of this Section prior to and during installation, and protect the installed work and materials of other trades.
- C. In the event of damage during construction, make all repairs and replacements necessary to the approval of the Architect, at no additional cost to the Owner.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Chain link fences
 - 2. Gates and gate hardware.

1.2 RELATED REQUIREMENTS

- A. Section 01 6116, Volatile Organic Compound (VOC) Restrictions, for VOC limits pertaining to adhesives, sealants, fillers, primers, and coatings.
- B. Section 01 8113, Sustainable Design Requirements, for CAL-Green general requirements and procedures.
- C. Section 32 1600, Site Concrete.
- D. Section 08 7100, Door Hardware, for padlocks.

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CAL Green), edition as noted on the drawings, as adopted by the California Division of the State Architect (DSA).
- C. Chain Link Fence Manufacturers' Institute (CLFMI):
 - 1. Products Manual.
- D. ASTM International (ASTM):
 - 1. A153: Zinc Coating (Hot Dip) on Iron and Steel Products.
 - 2. A392: Zinc Coated Steel Chain Link Fence Fabric.
 - 3. A653/A653M: Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
 - 4. A780/A 780M: Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings.
 - 5. C33/C33M: Standard Specification for Concrete Aggregates.
 - 6. C94: Ready-mixed Concrete.
 - 7. C150/C150M: Standard Specification for Portland Cement.
 - 8. F668: Poly Vinyl Chloride (PVC) Coated Steel Chain Link Fence Fabric.
 - 9. F934: Standard Colors for Poly Vinyl Chloride (PVC) Coated Chain Link.
 - 10. F969: Standard Practice for Construction of Chain-Link Tennis Court Fence.

CHAIN LINK FENCES AND GATES
SECTION 32 3113
3595001

11. F1083: Pipe, Steel, Hot-Dipped Zinc Coated (Galvanized) Welded, for Fence Structures.

1.4 ADMINISTRATIVE REQUIREMENTS

A. Submittal Procedures:

1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
3. Sustainable Design Submittals shall comply with the additional requirement of Section 01 8113, Sustainable Design Requirements.

1.5 ACTION SUBMITTALS

- A. Shop Drawings: Submit showing all parts, connections and anchorages, adjacent materials, fully dimensioned and noted. Indicate plan layout, spacing of components, post foundation dimensions, hardware anchorage and schedule of components.
- B. Products Data: Submit list and complete descriptive data of all products proposed for use. Include manufacturer's specifications, published warranty or guarantee, installation instructions, and maintenance instructions.
- C. Samples:
1. Chain-link fabric, approximately 12 inches square, in selected color.
 2. Hardware and fittings if requested by Architect.

1.6 INFORMATIONAL SUBMITTALS

- A. Sample of manufacturer's warranty.
- B. Sustainable Design:
1. General:
 - a. Submit information necessary to establish and document compliance with the California Green Building Standards Code.
 - b. Sustainable design submittals are in addition to other submittals.
 2. The following information shall be provided:
 - a. Paints and Coatings: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.

1.7 CLOSEOUT SUBMITTALS

- A. Warranty/Guarantee: Submit executed warranty and Subcontractor's guarantee.

1.8 QUALITY ASSURANCE

- A. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.
- B. Use materials and products of one manufacturer whenever possible.
- C. All materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.

1.9 DELIVERY, STORAGE AND HANDLING

- A. Deliver undamaged products to job in manufacturer's sealed containers and/or original bundles with tags and labels intact.
- B. Store materials in protected, dry conditions off of ground and in areas so as to not interfere with the progress of the work.
- C. Transport, store and handle in strict accord with the manufacturer's written recommendations.

1.10 FIELD CONDITIONS

- A. Make and be responsible for all field dimensions necessary for proper fitting and completion of work. Report discrepancies to Architect before proceeding.

1.11 WARRANTY

- A. Manufacturer: In addition to the Contractor's and Subcontractor's Guarantee, furnish Owner with manufacturer's fully executed written warranty for chain link fencing against defects in materials and workmanship, including the following:
 - 1. Windscreen: 3 years.

PART 2 - PRODUCTS

2.1 DESIGN AND PERFORMANCE CRITERIA

- A. Industry Standards: Materials and installation shall conform to the requirements of the Chain Link Fence Manufacturers Institute (CLFMI) "Product Manual."
- B. Regulatory Requirements: Pedestrian gates and related hardware shall comply with applicable codes, including provisions for accessibility required by CBC and the Americans with Disabilities Act "Designs for Accessible Design." Comply with the most stringent.
- C. Use new components **[,except existing fence indicated to be relocated,]** free from defects affecting service and appearance.
- D. Sizes specified or shown are minimum.

CHAIN LINK FENCES AND GATES

SECTION 32 3113

3595001

- E. Provide ferrous material except as otherwise indicated or specified.
- F. Sustainable Design:
 - 1. VOC emissions for field-applied paints and coatings must comply with limits specified in Section 01 6116.

2.2 WORKMANSHIP

- A. Galvanizing: Hot dip galvanize ferrous materials after fabrication. Repair zinc coating damaged in shop or during field erection by re-coating with hot repair compound, Re Galv, Galvalloy, Galveweld-alloy, or equal, applied in accord with manufacturer's recommendations.

2.3 MATERIALS

- A. Vinyl Coated Chain Link Fabric: Steel wire with no less than 1.20 ounce of zinc coating per square foot of surface area, covered with color coating of polyvinyl chloride no less than 15 mils thick fusion method with breaking strength of 1200 pounds (Class 2b), and complying with ASTM F668.
 - 1. Typical:
 - a. Wire Diameter: 9 gage, coated size.
 - b. Mesh Opening: 2 inches.
 - 2. Edges: Knuckle fabric at bottom and at top selvage.
 - 3. Fabric widths shall be one piece.
 - 4. Color of PVC Coating: In compliance with ASTM F934, black.
- B. Security Fabric: 16 gauge galvanized sheet metal in conformance with ASTM A653/A653M, 1.3 pounds per square foot, with round hole perforations; McNichols item number 1431141638 as specified and the basis of design, or equal.
 - 1. Perforations shall be 3/16" holes on a 1/4" stagger.
 - 2. Open Area: 51 percent.
 - 3. Finish: Prime and paint as specified in Section 09 9100, Painting, prior to installation.
- C. Security Fabric U-Edging: 14 gauge. galvanized hot rolled U shaped edging, 1 inch tall face x 3/8 inch opening width; McNichols quality U-Edging, item number 4003801410 as specified and the basis of design, or equal.
- D. Round Steel Pipe Fence Framework:
 - 1. Round steel pipe and rail, Schedule 40 standard weight pipe, in accordance with ASTM F1083, 1.8 oz/sq. ft (550 g/sq. m) hot dip galvanized zinc exterior and 1.8 oz/sq. ft (550 g/sq. m) hot dip galvanized zinc interior coating.
 - a. Regular Grade: Minimum steel yield strength 30,000 psi (205 MPa)
 - b. High Strength Grade: Minimum yield strength 50,000 psi (344 MPa)

- E. Line Posts:
 - 1. Without Slats or Windscreen: Regular Grade.
 - a. To 8'-0" High Maximum: 2-3/8 inch outside diameter pipe at 3.65 pounds per linear foot.
- F. End, Corner and Pull Posts: End, corner and pull posts shall also comply with gate post requirements, where occurs.
 - 1. Without Slats or Windscreen: Regular Strength.
 - a. To 8'-0" High Maximum: 2-7/8 inch outside diameter pipe at 5.79 pounds per linear foot.
- G. Gate Posts, Single Leaf: Gate posts shall also comply with End, Corner and Pull Post requirements.
 - 1. To 6 Feet Wide: 2-7/8 inch outside diameter pipe at 5.79 pounds per linear foot.
- H. Post caps: Cast or malleable iron ball or acorn shape; with opening for top rail.
- I. Top Rail, Bottom Rails, and Braces: 1-5/8" outside diameter pipe at 2.27 pounds per linear foot., or 1-5/8 inch x 1-1/4 inch roll formed section, 14 gauge.
 - 1. Brace Assembly:
 - a. Equally spaced between top rail and bottom fabric selvage and run from end, gate, or corner post to first line posts with suitable malleable iron fittings.
 - b. Truss from line post to end, gate, or corner post with 3/8 inch round rod.
- J. Coating for Fencing Components, Including Posts: Polyester powder coating, 3 to 4 mils thick, applied by the electrostatic spray process and baked at 450-500 degrees until cured; with 55 to 70 gloss.
 - 1. Color: Black.
- K. Bands: 14 gauge x 1 inch wide steel spaced 15 inches on center. for securing stretcher bars to end and gate posts.
 - 1. Bands may be used in conjunction with special fitting for securing rails to end and gate posts.
 - 2. Chamfer to ease projecting edges of bands.

2.4 GATES

- A. Frames:
 - 1. Gate Leaves to 6 Feet Wide: 1-5/8 inch outside diameter pipe at 2.27 pounds per linear foot.
 - 2. Gate Leaves Over 6 Feet Wide: 2 inch outside diameter pipe at 2.72 pounds per linear foot.

CHAIN LINK FENCES AND GATES

SECTION 32 3113

3595001

3. Provide additional horizontal and vertical pipe or tube as necessary to assure proper gate operation and attachment of fabric and hardware.
- B. Diagonal Bracing: Provide adjustable length 3/8 inch truss rods on non-welded gate frames and welded gate frames where corner rigidity is insufficient to insure no sag.
- C. Fabric: As specified for fence.
- D. Gate Assembly:
 1. Weld or assemble gate frame with malleable or pressed steel fittings and rivets to provide rigid connections.
 2. Install fabric with stretcher bars at vertical edges, which may also be used at top and bottom edges.
 3. Securely attach stretcher bars and fabric to frame on all sides at 15 inches on center.
 4. Attach hardware with rivets or by other means which will provide security against removal.
- E. Gate Hardware:
 1. General: Hardware at disabled accessible gates shall meet accessibility, including mounting, of the ADA and CBC. Comply with the most stringent.
 2. Hinges: Malleable iron, pressed or forged steel, non-liftoff type, easy noiseless operation and long wear, offset to permit 180 degree gate opening.
 - a. Provide 1-1/2 pair hinges for each leaf over 6 feet nominal height.
 - b. Ball and socket hinges not acceptable.
 3. Fork Latch: Malleable iron, drop fork latch which permits operation of the gate from either side, with padlock eye provided as integral part of latch.
 4. Panic / Lever Hardware: At gates to receive panic hardware or lever locksets, provide galvanized iron lockset boxes, backing plates or mounting plates as required for permanent, vandal resistant mounting.
 5. Kick Plates: 10 inches tall x width of gate x 14 gauge minimum, smooth uninterrupted surfaced, galvanized steel.
 - a. Mount on the bottom edge of gate at the push side. Mount on both sides at two-way swing gates.
 - b. Bottom edge of plate shall be not more than 3 inches above the top of the walk.
 - c. Plate shall be welded to the fence frame and shall allow the gate to be opened by a wheelchair footrest without creating a trap or hazardous condition.
 - d. Provide at pedestrian gates that are within the disabled accessible path of travel
 6. Gate Stop and Holder: Malleable iron.
 - a. Stop shall automatically engages gate frame and holds it in open position.
 - b. Provide at vehicle gates.

7. Double Gates: Provide cane bolt and ground set keeper with locking device and padlock eyes designed as integral part of latch, requiring one padlock for locking both leaves.

2.5 ADDITIONAL MATERIALS AND COMPONENTS

- A. Galvanizing Repair: Zinc coating damaged in shop or during field erection shall be by re-coated using a hot repair compound; "Regalv" repair stick by Rotometals, San Leandro, CA, or equal, applied in accordance with manufacturer's recommendations.
- B. Concrete:
 1. Materials:
 - a. Portland cement, ASTM C 150.
 - b. Aggregate: ASTM C33.
 - c. Water: Potable and free from substances harmful to concrete.
 2. Mix materials to obtain low slump concrete with 28 day compressive strength of 2,500 psi.
 - a. Maximum Size Aggregate: 1-1/2 inch.
 - b. Re-tempering not permitted.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. General:
 1. Execute work in accord with best trade practice for industrial fence installations.
 2. Make welds neat and secure, grind off excess exposed metal.
 3. Securely set posts plumb in alignment at proper depth and height, and rigid bracing where needed; install fabric under tension and securely tie to posts, rails and braces.
 4. Gates shall move freely without sag.
- B. Setting Posts:
 1. General: Space posts as indicated but not more than 10 feet on center.
 2. Pour and tamp concrete leaving no voids.
 - a. Check posts for vertical and top alignment and hold in position.
 - b. Dome top of concrete and trowel smooth to shed water away from post.
 - c. Align posts in footings as follows:
 3. Without Slats or Windscreen: Footings for End, corner and pull posts shall also comply with gate post requirements, where occurs.
 - a. Line Posts to 8'-0" High Maximum: 1'-0" diameter, 3'-3" minimum embedment.

CHAIN LINK FENCES AND GATES

SECTION 32 3113

3595001

- b. End, Corner and Pull Posts to 8'-0" High Maximum: 1'-0" diameter, 4'-3" minimum embedment.
- 4. Single Leaf Gates: Footings for gate posts shall also comply with End, Corner and Pull Post requirements.
 - a. To 6 Feet Wide: 12 inch diameter, 36 inch embedment.
- C. Where posts occur adjacent to structures or other work where concrete foundations may conflict with post footing, block out to allow post installation or use off-set post. Hold post 4 inches clear from face of structure.
- D. Fabric: Leave about 1-1/2 inches between ground and bottom barbs.
 - 1. Pull fabric taut and tie to posts, rails **[and tension wires]**.
 - 2. Install fabric on security side of fence.
 - 3. Fabric shall remain under tension after pulling force is released.
- E. Gates:
 - 1. Install gates plumb, level and secure, with full swing or slide without interference.
 - 2. Install ground set items in substantial concrete mass for adequate anchorage.
- F. Tie Wires:
 - 1. Install with one tight turn to hold fabric firmly to frame.
 - 2. Bend ends of wire inward to prevent hazard to persons or apparel.
- G. Fasteners:
 - 1. Install nuts for tension band and hardware bolts on side of fence opposite fabric side.
 - 2. Spoil ends of bolts to prevent removal of nuts.

3.2 ADJUSTING

- A. Repair exposed zinc coatings damaged in shop or during field erection using specified repair system and in compliance with ASTM A 780,
- B. Adjust gated hardware for smooth operation and lubricate where necessary.

END OF SECTION

*p:\sacramento\3595 tracy unified school district\001-000_villalovoz es new shade structures\08 specifications\06 spec\04 final\poet christian\32 3113_chain link fences and gates.docx
Last Updated: February 25, 2022*

PART 1 - GENERAL

1.1 SUMMARY

A. Scope of Work:

1. Furnish all labor, materials, tools, equipment, and transportation required to perform and complete the installation of an automatic sprinkler irrigation system, including all piping, sprinkler heads, controls, connections, testing, etc. as shown on the Drawings and as specified herein. The water source for this project is potable water.
2. Utilize and accept as standards manufacturer's recommendations and/or installation details for any information not specifically detailed on the Drawings.

1.2 RELATED REQUIREMENTS

- A. Section 01 6116, Volatile Organic Compound (VOC) Restrictions, for VOC limits pertaining to adhesives, sealants, fillers, primers, and coatings.
- B. Section 01 8113, Sustainable Design Requirements, for CAL-Green general requirements and procedures.
- C. Section 31 0000, Earthwork.
- D. Section 31 2333, Trenching and Backfilling.
- E. Section 32 9000, Landscaping.

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CALGreen), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).

1.4 ADMINISTRATIVE REQUIREMENTS

A. Submittal Procedures:

1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
3. Sustainable Design Submittals shall comply with the additional requirements of Section 01 8113, Sustainable Design Requirements

**IRRIGATION
SECTION 32 8000
3595001**

B. Pre-Installation Meeting:

1. Request and hold a pre-installation meeting prior to beginning the work of this Section. Parties required to be in attendance are the Landscape Contractor, Project Inspector, Owner's Representative, and the Landscape Architect.

1.5 ACTION SUBMITTALS

- A. Product names are used as standards; provide proof as to equality of any proposed material and do not use other materials or methods unless approved in writing by the Owner's Representative. Submit no more than one request for substitution for each item. The decision of the Owner's Representative is final.
- B. Use equipment capacities specified herein as the minimum acceptable standards.
- C. List materials in the order in which they appear in Specifications; include substitutions. Submit the list for approval by the Owner's Representative.
- D. Make any mechanical, electrical, or other changes required for installation of any approved, substituted equipment to satisfaction of Owner's Representative and without additional cost to Owner. Approval by Owner's Representative of substituted equipment and/or dimensional drawing does not waive these requirements.
- E. Do not construe approval of material as authorization for any deviations from Specifications unless attention of Owner's Representative has been directed to specified deviations.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data for the following:
 1. For landscape contractor.
- B. Sample of manufacturers' warranty.
- C. Record of Pre-Installation Meeting.
- D. Sustainable Design:
 1. General:
 - a. Submit information necessary to establish and document compliance with the California Green Building Standards Code.
 - b. Sustainable design submittals are in addition to other submittals.
 2. The following information shall be provided:
 - a. Adhesives and Sealants: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.
 - b. Paints and Coatings: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.

1.7 CLOSEOUT SUBMITTALS

- A. Warranty/Guarantee: Submit executed warranty and subcontractor's guarantee.
- B. Maintenance and Operating Instructions:
 - 1. Furnish operating maintenance instructions bound in a hardback binder and indexed. Start compiling data upon approval of list of materials. Do not request final inspection until booklets are approved by Owner's Representative.
 - 2. Incorporate the following information in these sets:
 - a. Complete operating instructions for each item of irrigation equipment.
 - b. Typewritten maintenance instructions for each item of irrigation equipment.
 - c. Manufacturer's bulletins which explain installation, service, replacement parts, and maintenance.
 - d. Service telephone numbers and/or addresses posted in an appropriate place as designated by Owner's Representative.
- C. Record Drawings.

1.8 QUALITY ASSURANCE

- A. Qualifications: Work must be complete by a licensed Landscape Contractor. Provide proof of five years' continuous experience in landscaping and irrigation of projects of similar size.
- B. Certification: Ensure that the contractor installing the Central Control System is trained and certified in the installation of the Central Control System. The training and certification must have been completed within two years prior to the installation date.
- C. Work Force: Ensure that an experienced foreman is present at all times during installation. Keep the same foreman and workers on the job from commencement to completion.
- D. Reviews: Specifically request reviews of all items listed in Article INSPECTION REQUIREMENTS, prior to progressing to the next level of work.
- E. Standards:
 - 1. Provide work and material in full accordance with the rules and regulations of the National Electric Code; the Uniform Plumbing Code; and other applicable state or local laws or regulations.
 - 2. Furnish, without extra charge, additional material and labor required to comply with these rules and regulations, though the work may not be specifically indicated in the Specifications or Drawings.
 - 3. Where the Specification requirements exceed those of the above-mentioned codes and regulations, comply with the requirements in the Specifications.

**IRRIGATION
SECTION 32 8000
3595001**

1.9 DELIVERY, STORAGE AND HANDLING

- A. Transport, store and handle in strict conformance with the manufacturer's written recommendations.
- B. Deliver undamaged products to job in manufacturer's sealed containers and/or original bundles, with tags and labels intact. All material containers or certificates shall be clearly marked by manufacturer as to contents for inspection.
- C. Store materials in original undamaged packages and containers, inside well-ventilated area protected from weather, moisture, soilage, extreme temperatures, and humidity. Lay flat, blocked off ground.
- D. Use all means necessary to protect irrigation system materials before, during, and after installation and to protect related work and material.
- E. Handle plastic pipe carefully, especially protecting it from prolonged exposure to sunlight. Store pipe on beds that are the full length of the pipe, and keep pipe flat.

1.10 FIELD CONDITIONS

- A. Information on Drawings relative to existing conditions is approximate. During progress of construction, make deviations necessary to conform to actual conditions, as approved by Owner's Representative, without additional cost to Owner. Accept responsibility for any damage caused to existing services. Promptly notify Owner's Representative if services are found which are not shown on Drawings.
- B. Protect existing trees-to-remain as specified in "Existing Tree Protection" in Article PREPARATION, in Part 3 of this Section.
- C. Protect existing utilities within construction area. Repair damages to utility lines that occur as a result of operations of this work.
- D. Verify dimensions at building site and check existing conditions before beginning work. Make changes necessary to install work in harmony with other crafts after receiving approval by Owner's Representative.

1.11 INSPECTION REQUIREMENTS

- A. Obtain verification from Project Inspector for the following at the appropriate times during construction and prior to further progression of work in this Section:
 - 1. Pressure testing of all mainlines and lateral lines (See "Hydrostatic Tests – Open Trench" in Article FIELD QUALITY CONTROL, in Part 3 of this Section),
 - 2. Trench depth,
 - 3. Sleeves under pavement,
 - 4. Flushing of all mainlines and lateral lines,
 - 5. Backfill and pipe bedding,

- 6. Layout of heads,
 - 7. Operation of system and coverage adjustments (with Landscape Architect) after system is fully automated and operational, backfill of trenching is completed, and surface has been restored to original grades.
- B. In case of failure to obtain any verification by the Project Inspector as required above, remove and replace work as necessary to obtain the verification at no additional cost to the Owner.

1.12 WARRANTY AND GUARANTEE

- A. Manufacturer: In addition to the Contractor's and Subcontractor's Guarantee, furnish Owner with manufacturer's available fully executed written warranty against defects in materials and workmanship.
- B. Subcontractor Guarantee: Shall include damage by leaks and settlement of irrigation trenches.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Use materials as specified; any deviation from the Specifications must first be approved by the Owner's Representative in writing.

2.2 DESIGN AND PERFORMANCE CRITERIA

- A. Sustainable Design:
 - 1. VOC emissions for field-applied adhesives, sealants, and sealant primers must comply with limits specified in Section 01 6116.
 - 2. VOC emissions for field-applied paints and coatings must comply with limits specified in Section 01 6116.

2.3 MATERIALS

- A. Automatic Control Valves: As indicated on Drawings.
- B. Gate Valve: As indicated on Drawings.
- C. Pipe and Fittings:
 - 1. PVC pipe: As indicated on Drawings.
 - 2. PVC fittings three-inch (3") size and smaller: High impact, standard weight, Schedule 40, molded PVC as manufactured by George Fischer, Lasco, Spears, or approved equal.

IRRIGATION
SECTION 32 8000
3595001

3. PVC fittings four-inch (4") size and larger: High impact, standard weight, Class 200 gasketed, molded PVC as manufactured by George Fischer, Lasco, Spears, or approved equal.
 4. All plastic pipe and fittings: Continuously and permanently marked with manufacturer's name, type of material, IPS size, schedule, NSF approval, and code number.
 5. Threaded PVC pipe and nipples: IPS Schedule 80 when necessary to use threaded connections to gauges, valves, or control valves. Threaded adapters may be used in place of nipples when making pipe to valve connections.
 6. Use 45-degree fittings for changes in depth of pipe, and at transition from main line to automatic control valves.
 7. Piping above ground: Schedule 40 galvanized steel with cast-iron fittings.
- D. PVC Primer: Weld-On P-70 Purple Primer or approved equal.
- E. PVC Glue: Weld-On 711 Gray heavy bodied PVC Cement or approved equal.
- F. Sprinkler Heads: As indicated on Drawings.
- G. Quick Coupler Valves: As indicated on Drawings.
- H. Sleeves: As indicated on Drawings.
- I. All Valve Boxes and Covers: Manufactured, green with "Irrigation – Non-Potable" permanently embossed on cover. Carson, Rainbird or approved equal.
- J. Reduced Pressure Backflow Preventer: As indicated on Drawings.
- K. Automatic Sprinkler Control Wire:
1. Connections between remote control valves and controller: UF-14 direct burial polyethylene (PE) insulated wire, Paige Electric P7079D or approved equal. Common wire to be white, and lead wire to be colored. If multiple controllers are used, a different color is to be used for each controller's lead wire. (Use red for the first controller). Spare wires are to be yellow.
 2. UL Listed waterproof sealing pack for wire connections: 3M DBR/Y-6, or approved equal.
 3. Provide adequate working space around electrical equipment in compliance with local codes and ordinances.
 4. Electrical, other than low voltage, such as power wiring, conduit, fuses, thermal overloads and disconnect switches, is included under Division 26 of these Specifications.
- L. Unions And Flanges:
1. Steel unions and flanges two inches (2") and smaller: 150 lb. screwed black (brass to iron seat) or galvanized malleable iron (ground joint).

2. Steel unions and flanges two and one-half inches (2 ½") and larger: 150 lb. black flange union, flat-faced, full gasket.
 3. Gaskets: One-sixteenth inch (1/16") thick rubber Garlock No. 122, Johns-Manville or approved equal.
 4. Flange Bolts: Open-hearth bolt steel, square heads with cold pressed hexagonal nuts, cadmium plated in ground. Provide copper-plated steel bolts and nuts or brass bolts and nuts for brass flanges.
- M. Sand for Trench Backfill: Natural sand, free of roots, bark, sticks, rags, or other extraneous material

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Prior to commencement of the work of this Section, obtain written verification from the project Civil Engineer that the rough grade in landscape areas is in conformance with Section 31 0000 - Earthwork.
- B. Examine conditions of work in place before beginning work; report defects.

3.2 PREPARATION

- A. Scheduling: Notify the Project Inspector prior to commencing and/or continuing the work of this Section. Remove and replace, at no cost to Owner, any work required as a result of failure to give the appropriate notification.
- B. Measurements: Take field measurements; report variance between plan and field dimensions.
- C. Protection: Maintain warning signs, shoring and barricades as required. Prevent injury to, or defacement of, existing improvements. At no additional cost to Owner, repair or replace items damaged by installation operations.
- D. Existing Tree Protection:
 1. Avoid unnecessary root disturbance, compaction of soils within drip line, or limb breakage.
 2. Do not store material or dispose of any material other than clean water within the drip line.
 3. Provide adequate irrigation during construction.
 4. Replace any tree damaged during construction with a tree of equal size and value at no additional cost to Owner.
 5. Adjust trench locations in field to minimize damage to existing elements and plant roots of trees-to-remain at no additional cost to Owner.

**IRRIGATION
SECTION 32 8000
3595001**

- E. Surface Preparation: Prior to beginning sprinkler irrigation work, complete placement of topsoil as specified in Section 31 0000 – Earthwork. Notify Project Inspector of irregularities if any.

3.3 AUTOMATIC CONTROLLER

- A. Connect automatic control valves to controller(s) in sequence as shown on Drawings.
- B. Install all exposed wires to a minimum of twenty-four inches (24") beyond controller within a UL approved rigid conduit.

3.4 GRADING

- A. Install all irrigation features to their finished grade and at depths indicated. Complete and /or accommodate all rough grading and/or finish grading before commencing with trenching.

3.5 LAYOUT

- A. Lay out work as accurately as possible to Drawings. Drawings are generally diagrammatic to extent that swing joint offsets and fittings are not shown. Record all changes on the Record Drawings.
- B. Do not willfully install the irrigation system as shown on Drawings when it is obvious, in the field, that obstructions or other discrepancies exist which may not have been considered in the design. Notify Owner's Representative of discrepancies before proceeding.

3.6 EXCAVATING AND TRENCHING

- A. General: Perform excavations as required for installation of work included under this Section, including shoring of earth banks to prevent cave-ins. Restore surfaces, existing underground installations, etc., damaged or cut as result of this work to their original condition and in a manner approved by the Landscape Architect.
- B. Width:
 - 1. Make trenches wide enough to allow a minimum of six inches (6") between parallel pipelines and three inches (3") between side of pipe and side of trench. Do not allow stacking of pipe within trench.
 - 2. Allow a minimum clearance of twelve inches (12") in any direction from parallel pipes of other trades.
- C. Preparation of Excavations: Remove rubbish and rocks from trenches. Bed pipe on a minimum of three inches (3") of clean, rock-free soil to provide a firm, uniform bearing for entire length of pipeline. If clean, rock-free soil is not available, use sand for pipe bedding. See Backfill and Compacting for the remainder of the trench backfill.

- D. Minimum depth of cover: Unless shown otherwise, provide the following minimums:
 - 1. Mainline: twenty-four inches (24") cover.
 - 2. Lateral line: twelve inches (12") cover for spray heads, and eighteen inches (18") cover for rotor heads.
- E. Conflicts with other trades:
 - 1. Hand-excavate trenches where potential conflict with other underground utilities exist.
 - 2. Where other utilities interfere with irrigation trenching and piping work, adjust the trench depth as instructed by Owner's Representative.

3.7 BACKFILL AND COMPACTING

- A. General: Do not begin until hydrostatic tests are completed and when system is operating and after required tests and inspections have been made.
- B. Backfill directly around the pipe: Cover pipe with a minimum of three inches (3") of clean, rock-free soil. If clean, rock-free soil is not available, use sand for three inches (3") of backfill above the pipe. The remainder of the trench backfill material can be native soil or material described below. Do not allow wedging or blocking of pipe.
- C. For backfill of trenches under paving areas:
 - 1. See Section 31 0000 – Earthwork for compaction rates and material
 - 2. See Section 31 2333 – Trenching and Backfilling for trench backfill procedure.
- D. For backfill of trenches in landscape areas:
 - 1. Place backfill in six-inch (6") layers and compact with an acceptable mechanical compactor.
 - 2. Compact backfill material in landscape areas to eighty-five percent (85%) maximum dry density of the soil.
 - 3. If settlement occurs along trenches, make adjustments in pipes, valves, and sprinkler heads, soil, sod or paving as necessary to bring the system, soil, sod or paving to the proper level or the permanent grade, without additional cost to the Owner.
- E. Excess Soil: Remove all rocks, debris, and excess soil that results from sprinkler irrigation trenching operations, landscape planting, and soil preparation operations off site at no additional cost to the Owner. If soil meets topsoil requirements in Section 31 0000 – Earthwork, it may be used for finish grading.
- F. Finishing: Dress-off areas to eliminate construction scars.

**IRRIGATION
SECTION 32 8000
3595001**

3.8 CONTROL WIRES

- A. General: Install control wires beneath sprinkler main line whenever possible; tape wires to mainline pipe. Provide one spare wire for each controller.
- B. Slack Wire: Provide eighteen inches (18") of slack wire for each wire connected to automatic control valve. Slack wire shall be coiled and left in the valve box. Tape wires in bundles every ten feet (10'); do not tape wires in sleeves.
- C. Expansion and Contraction: Snake wire in trench to allow for contraction of wire.
- D. Wire Passing Under Existing or Future Paving or Construction: Encase in PVC Schedule 40 or galvanized steel conduit extending at least twelve inches (12") beyond edges of paving or construction.
- E. Wire Connections: Install wire connections in a waterproof sealing pack.
- F. Wire Splicing: Permit splicing only on runs exceeding 500 feet. Locate all splices within valve boxes.
- G. Wire Termination: Install wire in a valve box with eighteen inches (18") of slack wire coiled and individually capped with approved waterproof sealing pack.
- H. Spare Wire: Install two (2) spare wires along each wire path. If there is more than one wire path from the controller, the contractor to install two (2) spare wires per path. Provide eighteen inches (18") of slack wire at each automatic control valve.

3.9 FLUSHING LINES

- A. Thoroughly flush lines prior to installing valves, performing hydrostatic testing, or installing sprinklers. Divert water to prevent washouts.

3.10 AUTOMATIC CONTROL AND QUICK COUPLER VALVES

- A. Install where shown and where practical; place no closer than twelve inches (12") to walk edges, building walls, or fences. Refer to detail for example.
- B. Thoroughly flush mainline before installing valve.
- C. Install valves in ground cover areas where possible.

3.11 PIPING

- A. General: Install in conformance with reference standards, manufacturer's written directions, as shown on Drawings and as herein specified.
- B. Workmanship:
 - 1. General: Install sprinkler irrigation equipment in planted areas throughout the site.
 - 2. Coordination: Organize location of sleeves with other trades as required.

C. Pipe Line Assembly:

1. General:
 - a. Cutting: Cut pipe square; remove rough edges or burrs.
 - b. Solvent-welded Connections: Use materials and methods recommended by the pipe manufacturer.
 - c. Brushes: Use non-synthetic brushes to apply solvents and primer.
 - d. Cleaning: Clean pipe and fittings of dirt, moisture, and debris prior to applying solvent or primer.
 - e. Assembly: Allow pipe to be assembled and welded on the surface or in the trench.
 - f. Expansion and Contraction: Snake pipe from side to side of trench to allow for expansion and contraction.
 - g. Location: Locate pipes as shown on Drawings except where existing supply valves, utilities or obstructions prohibit or where slight changes are approved to better suit field conditions.
2. Flexible Elastometric Seal Joints:
 - a. General: Assemble in strict conformance with the pipe manufacturer's instruction.
 - b. Rubber Rings: Use rubber rings specific for water service systems.
 - c. Cleaning: Thoroughly clean ring and groove of dirt, moisture and debris using a clean, dry cloth. Do not use solvents, lubricants, cleaning fluids or other material for cleaning.
 - d. Seating: Properly seat ring in groove.
 - e. Spigot:
 - 1) General: Clean spigot-end of pipe as in "Cleaning" above prior to applying lubricant recommended by pipe manufacturer.
 - 2) Seating: Insert spigot into bell and seat to full depth required.
3. Connections:
 - a. Threaded Plastic Pipe Connection:
 - 1) Use Teflon tape or pipe joint compound.
 - 2) When assembling to threaded pipe, take up joint no more than one full turn beyond hand-tight.
 - b. Metal Valves and Plastic Pipe: Use threaded plastic male adapters.
 - c. Metal to Metal Connections:
 - 1) Use specific joint compound or gasket material for type of joint made. Where pipe of dissimilar metals are connected, use dielectric fittings.
 - 2) Where assembling, do not allow more than three full threads to show when joint is made up.
 - d. Where assembling soft metal (brass or copper) or plastic pipe, use strap-type friction wrench only; do not use a metal-jawed wrench.
 - e. Threading:

**IRRIGATION
SECTION 32 8000
3595001**

- 1) Do not permit the use of field-threading of plastic pipe or fittings. Use only factory-formed threads.
 - 2) Use factory-made nipples wherever possible. Permit the use of field-cut threads in metallic pipe only where absolutely necessary. When field-threading, cut threads accurately on axis with sharp dies.
 - 3) Use pipe joint compound for all threaded joints. Apply compound to male thread only.
4. Sleeves and conduits:
- a. Use sleeves of adequate size to accommodate retrieval for repair of wiring or piping and extend a minimum of twelve inches (12") beyond edges of walls or paving.
 - b. Provide removable, non-decaying plug at end of sleeve to prevent entrance of soil.
5. Unions: Locate unions for easy removal of equipment or valve.
6. Capping: Plug or seal opening as lines are installed to prevent entrance materials that would obstruct pipe. Leave in place until removal is necessary for completion of installation.

3.12 SPRINKLER HEADS

- A. Sprinkler heads: Locate as shown on the Drawings except where existing conditions prohibit, or slight changes are approved to achieve as good or better coverage under the same conditions. Do not allow sprinkler head spacing to exceed the maximum shown on the Drawings. Plumb heads.
- B. Handling, Assembly of Pipe, Fittings, and Accessories: Allow only skilled tradesmen to handle and assemble pipe, fittings and equipment. Keep interior of pipes, fittings and accessories clean at all times. Close ends of pipe immediately after installation; leave closure in place until removal is necessary for completion of installation. Do not permit bending of pipe.
- C. Flushing: Remove end heads and operate system at full pressure until all rust, scale, and sand is removed. Divert water to prevent ponding or damage to finished work.
- D. Coverage: Accept responsibility for full and complete coverage of irrigated areas to satisfaction of Landscape Architect and make necessary adjustments to better suit field conditions at no additional costs to Owner.

3.13 FIELD QUALITY CONTROL

- A. Visual Inspection: Verify that all pipe is homogenous throughout and free from visual cracks, holes, or foreign materials. Inspect each length of pipe. All materials are subject to impact test at the discretion of the Landscape Architect.

B. Hydrostatic Tests – Open Trench:

1. Center-load piping with a small amount of backfill to prevent arching or slipping under pressure.
2. Request the presence of the Project Inspector in writing at least forty-eight hours in advance of testing.
3. At no additional cost to Owner, test in the presence of the Project Inspector.
4. Apply continuous static water pressure of 100 psi when welded plastic joints have cured at least twenty-four hours, and with the risers capped, as follows: test main lines and submains for four hours; test lateral lines for two hours.
5. Repair leaks resulting from tests; and repeat tests.
6. Test to determine that all sprinkler heads function according to manufacturer's data and give full coverage according to intent of Drawings. Replace any sprinklers not functioning as specified with ones that do, or otherwise correct system to provide satisfactory performance.

C. Continuity Testing: Test locating device and control wires for continuity prior to and after back-filling operations.

3.14 CLEAN-UP

- A. Remove debris resulting from work of this Section.**

3.15 ADJUSTMENTS AND MAINTENANCE

- A. Adjusting System:** Prior to acceptance, satisfactorily adjust and regulate entire system. Set watering schedule on controller appropriate to types of plants and season of year. Adjust remote control valves to operate sprinkler heads at optimum performance based on pressure and simultaneous demands through supply lines.
- B. System Layout:** Provide reduced prints of Record Document irrigation plans, laminated in four (4) mil. plastic, of size to fit controller door. Enlarge remote-control valve designations as necessary for legibility. Color-code areas covered by each station. Affix plans to inside of controller door.
- C. Instructions:** Upon completion of work, instruct maintenance personnel on operation and maintenance procedures for entire system.
- D. Flow Charts:** Record and prepare an accurate flow-rate chart for each automatic control valve.

3.16 RECORD DRAWINGS

- A. As specified in Section 01 3300, Submittal Procedures, and the following:**
1. Regularly update plans of the system and any changes made to the system throughout the project. Record all changes on this plan before trenches are back-filled.

IRRIGATION
SECTION 32 8000
3595001

2. Record complete as-built information and submit the Record Drawings to the Architect before applying for payment for work installed.
3. Show the following on the Record Drawings accurately to scale and dimensioned from two permanent points of reference:
 - a. and spares Distance of mainline from nearby hardscape.
 - b. Location of automatic control valves, quick couplers, and gate valves.
 - c. Location and size of all sleeves.
 - d. Location of automatic control wires.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Soil Preparation and Fertilization
 - 2. Planting
 - 3. Sodding
 - 4. Weed Control
 - 5. Mulch
 - 6. Clean-up
 - 7. Landscape Maintenance Period
- B. Work not included in this Section: Landscape elements such as concrete walks, fencing, outdoor lighting, rough grading, and clearing are not a part of this Section unless shown on the landscape Drawings.

1.2 RELATED REQUIREMENTS

- A. Section 01 8113, Sustainable Design Requirements, for CAL-Green general requirements and procedures
- B. Section 31 0000, Earthwork.
- C. Section 32 8000, Irrigation

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CALGreen), edition as noted on the drawings, as adopted by the California Division of the State Architect (DSA).
- C. EPA - Federal Insecticide, Fungicide and Rodenticide Act.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Submittal Procedures:
 - 1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.

LANDSCAPING
SECTION 32 9000
3595001

2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
- B. Pre-Installation Meeting: Request and hold a pre-installation meeting prior to beginning the work of this Section. Parties required to be in attendance are the Landscape Contractor, Project Inspector, Owner's Representative, and Landscape Architect.
- C. Pre-scheduled On-site Project Meetings: Hold regularly-scheduled (monthly or bimonthly as determined by the Landscape Architect) on-site project meetings with the Landscape Architect, Project Inspector and Owner's Representative. Dates and times will be jointly agreed upon.

1.5 ACTION SUBMITTALS

- A. Plant Material: Within fifteen (15) days after award of contract, locate plant materials required for construction. Ensure that trees and shrubs are contract- grown from a certified nursery. Notify Owner's Representative of plant material "tied off" for review at selected nursery. If specified material is not obtainable, submit the following to Owner's Representative: proof of non-availability, proposal for use of equivalent material, photographs of alternative choices of plant material. Include clear, written description of type, size, condition, and general character of plant material.
- B. Data Sheets:
 1. Provide product data for each type of landscape material indicated in the Drawings and Specifications.
 2. Letter from the manufacturer stating that the soil amendment material submitted for use on this project has no metal fragments or foreign objects.
- C. Samples: Submit samples of the following materials to Landscape Architect for approval:
 1. Soil amendment: (3) one-quart zip-locked plastic bags.
 2. Bark Mulch: (3) one-quart zip-locked plastic bags.
 3. Imported Topsoil: (3) one-quart zip-locked plastic bags.
- D. Provide soils analysis reports prepared by a qualified soils laboratory in accordance with the Soils Testing Requirements under "Soil Testing" in Article SOIL TESTING, in Part 3 of this section.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For landscape contractor.
- B. Prior to planting, submit copies of all trucking or packaging tags for all soil amendment, fertilizer and other additives to Landscape Architect so the quantities can be verified.
- C. Record of Pre-Installation Meeting.

1.7 CLOSEOUT SUBMITTALS

- A. Guarantee: Submit Subcontractor's guarantee.
- B. Record Drawings.

1.8 QUALITY ASSURANCE

- A. Qualifications: Work must be completed by a licensed Landscape Contractor. Provide proof of five years of continuous experience in landscaping and irrigation of projects of similar size (+/- 20% of the construction cost) and scope for education campuses. Landscape Contractor to have a minimum of two projects either completed or in construction in the last five years.
- B. Work Force: Ensure that an experienced foreman is present at all times during installation. Keep the same foreman and workers on the job from commencement to completion.
- C. Reviews: Specifically request reviews of all items listed below in Article INSPECTION REQUIREMENTS prior to progressing to the next level of work. The Owner's Representative reserves the right to inspect and reject material, both at place of growth and at site, before and/or after planting, for compliance with requirements for name, variety, size and quality.
- D. Reference Standards: Meet or exceed Federal, State and County laws requiring inspection of all plants and planting materials for plant disease and insect control.
- E. Plant Material:
 - 1. Conform to the current edition of Horticultural Standards for quality of Number 1 grade nursery stock as adopted by the American Association of Nurserymen. Conform to sizes specified on plant legend. Select plants which have a natural shape and appearance.
 - 2. Select only plants that are true to name, and tag one of each bundle or lot with the name of the plant in accordance with the standards of practice of the American Association of Nurserymen. In all cases, botanical names shall take precedence over common names.
 - 3. Tag each plant of a patented variety with the variety and identification number, where applicable, as it is delivered to the job site.
 - 4. Select only plants which have been nursery-grown in accordance with good horticultural practices and which have been grown under climatic conditions similar to those in the locality of the project for at least one year.
 - 5. Select only plants which are typical of their species or variety; have normal habits of growth; are sound, healthy, vigorous, well-branched and densely-foliated when in leaf; are free of disease, insect pests, eggs or larvae; and have a healthy and well-developed root system.

LANDSCAPING
SECTION 32 9000
3595001

6. Select only container stock that has been grown in the containers in which delivered for at least six (6) months, but not over two (2) years. Provide samples to show that there are no root-bound conditions.
7. Do not use plants that are severely pruned or headed-back to meet size requirements.
8. Do not plant container-grown plants that have cracked or broken balls of earth when taken from the container. Remove canned stock carefully from cans after containers have been cut on two sides with tin snips or other approved cutter.
9. At any time prior to final acceptance, be prepared to replace any plants that are rejected by the Owner's Representative because of physical damage to the plant.
10. Do not remove container-grown stock from containers before time of planting.
11. Stake shrubs with one-inch by one-inch by eighteen-inch (1"x1"x18") stakes in such manner that the stakes are not visible, and tie to upright position if they lean and/or are not growing in a vertical position.
12. Furnish quantities necessary to complete the work as shown on the Drawings and, if necessary, make up for any discrepancies in the quantities given in the Plant List at no additional cost to Owner.

1.9 DELIVERY, STORAGE AND HANDLING

- A. Packaged Materials: Deliver packaged materials in original, unopened containers showing weight, certified analysis, name and address of manufacturer, and indication of conformance with state and federal laws if applicable.
- B. Coordinate a time for the Landscape Architect to inspect the plants upon their delivery to the project site.
- C. Bulk Materials:
 1. Do not dump or store bulk materials near structures, utilities, walkways or pavements, or on existing turf areas or plants.
 2. Provide erosion-control measures to prevent erosion or displacement of bulk materials, discharge of soil-bearing water runoff, and airborne dust reaching adjacent properties, water conveyance systems, or walkways.
 3. Accompany each delivery of bulk fertilizers and soil amendments with appropriate certificates.

1.10 FIELD CONDITIONS

- A. Planting Season Limits: Do not plant when grounds are wet or temperature is below 25° F. Do not proceed with any soil preparation and fertilization if all planting cannot be completed within Planting Season Limit.

1.11 INSPECTION REQUIREMENTS

- A. Landscape Architect reserves the right to examine and reject plant material both at place of growth and at site, before and after planting, for compliance with requirements of name, variety, size, and quality.
- B. Obtain verification from Project Inspector for the following at the appropriate times during construction and prior to further progression of work in this Section:
 - 1. Rough grading is to tolerances specified in Section 31 0000 – Earthwork.
 - 2. The placement of landscape backfill material is as specified in this Section.
 - 3. Prior to the commencement of planting operations specified in this Section, the coverage and operation of the sprinkler irrigation system are as specified in Section 32 8000 - IRRIGATION.
 - 4. Required Test: For each load of soil amendment delivered to the site, spread at least two cubic yards (2 cy) of material onto a paved surface approximately two inches (2") deep. Pass a magnetic rake over the material in two directions. If any metal is found, test the entire load in the same manner. Perform all testing in the presence of the Project Inspector.
 - 5. Soil amendments, fertilizer, and bark mulch and materials have been delivered to the site by the supplier, the invoices from the supplier indicate the project name and quantities delivered, and the Project Inspector has received copies of all such documents.
 - 6. Prior to planting, amendments and conditioners have been incorporated as per pre-planting recommendations, and planting areas have been made ready to receive planting.
- C. In case of failure to obtain any verification by the Project Inspector as required above, remove and replace work as necessary to obtain the verification at no additional cost to the Owner.

1.12 PROTECTION

- A. Provide protection for persons and property throughout progress of work. Use temporary barricades as required. Proceed with work in such manner as to minimize spread of dust and flying particles and to provide safe working conditions for personnel. Store materials and equipment where directed.
- B. Existing Construction: Execute work in an orderly and careful manner to protect paving, work of other trades, and other improvements.
- C. Existing Utilities: Provide protection for existing utilities within construction area. At no additional cost to Owner, repair any damages to utility lines that occur as a result of this work.

LANDSCAPING
SECTION 32 9000
3595001

- D. Landscaping: Protect landscape work and materials from damage due to landscape operations, operations by other contractors and trades, and trespassers. Maintain protection during installation and maintenance periods.

1.13 PLANTING SCHEDULE

- A. Install, establish, and maintain all lawn areas for a minimum of ninety (90) days prior to date of substantial completion. Coordinate schedule with other work and overall project schedule. Failure to install lawn areas by this date shall result in assessment of liquidated damages.
- B. Proceed with work in an orderly and timely manner to complete installation of landscaping within contract limits.

1.14 LANDSCAPE MAINTENANCE PERIOD REQUIREMENTS

- A. Beginning of Landscape Maintenance Period:
 - 1. General: Landscape Maintenance Period does not begin until all work is installed and either the sod has been placed, as determined by Landscape Architect, in writing.
 - 2. On-site Inspection: When all work is complete, request and hold a meeting to include the Landscape Architect, Project Inspector, Architect and Owner's Representative who must together authorize and determine the start date for the landscape maintenance period. Coordinate and give notice of the date and time of the on-site meeting to all parties at least forty-eight (48) hours in advance.
 - 3. Acceptability: In cases where the lawn has reached adequate fullness and germination in some areas but not all, and authorization has not been given to begin the maintenance period, proceed with mowing, trimming, spraying, etc., as necessary prior to the beginning of the maintenance period.
- B. Duration of Landscape Maintenance Period:
 - 1. The Landscape Maintenance Period shall continue for a minimum of ninety (90) calendar days. During this time, continuously maintain all areas involved until final acceptance of the work by the Owner's Representative. See Landscape Maintenance Period procedure in Article LANDSCAPE MAINTENANCE, in Part 3 of this Section.

1.15 GUARANTEE

- A. The guarantee period for lawn and plant material shall be the duration of the landscape maintenance period, from commencement until final acceptance of the work of this Section.
- B. During the guarantee period, repair and/or replace plants and lawn not in satisfactory growing condition, as determined by Owner's Representative, without additional cost to Owner. Plants are to be replaced in accordance with Article LANDSCAPE MAINTENANCE in Part 3 of this Section, using plants of the same kind and size specified in plant list.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Use material in new and perfect condition as specified. Any deviations or substitutions from the Specification and Drawings must first be approved by Owner's Representative in writing prior to use.

2.2 SOIL PREPARATION MATERIALS

- A. Topsoil: Fertile; friable; natural loam surface soil; reasonably free of subsoil, clay lumps, brush, weeds and other litter; and free of roots, stumps, stones/rocks, and other extraneous or toxic matter harmful to plant growth.
- B. Soil Amendment: One-percent nitrogen-impregnated bark product with a ninety-percent (90%) bark base and zero to one-quarter inch (0-1/4") particle size, or approved equivalent. Do not spread until testing requirements have been satisfied.
- C. Fertilizer/Soil Conditioner: Gro-Power Plus or approved equal.
- D. Fertilizer for Trees and Shrubs: Seven-gram Gro-Power Planting Tablets (12-8-8 NPK) or approved equal.
- E. Vitamin B-1: "Superthrive", "Liquinox Start", "Cal-Liquid", or approved equal.

2.3 MISCELLANEOUS LANDSCAPE MATERIALS

- A. Bark Mulch: Untreated, shredded cedar.
- B. Tree-staking System: As indicated on Drawings.
- C. Pre-Emergent Weed Control: Oxadiazon, "Treeflan", "Ronstar 2G", "Surflan" (Elano Products Company), or approved equal.

**LANDSCAPING
SECTION 32 9000
3595001**

2.4 PLANT MATERIAL:

- A. Nursery Plant Stock:
 - 1. As indicated on Drawings. Do not remove container-grown stock from containers until planting time. Plants shall be true to name.
 - 2. Healthy, shapely, well-rooted, not pot-bound, free from insect pests or plant diseases and properly "hardened off" before planting. Replace plants that are not alive or are not in satisfactory growing condition, as determined by the Landscape Architect, without additional cost to Owner. The Landscape Architect may reject plants before and/or after planting.
 - 3. Labeled. Label at least one tree and one shrub of each species with a securely-attached, waterproof tag bearing legible designation of botanical and common name.
- B. Lawn Sod: Eighty percent (80%) Perennial Ryegrass and twenty percent (20%) Kentucky Bluegrass.

PART 3 - EXECUTION

3.1 SITE CONDITIONS

- A. Examine the site, verify grade elevations, and observe conditions under which work is to be performed. Do not proceed with work until unsatisfactory conditions have been corrected in a manner acceptable to the Owner's Representative.
- B. Proceed with complete landscape work as rapidly as portions of the site become available, working within seasonal limitations for each kind of landscape work required.
- C. Determine location of underground utilities and perform work in a manner which will avoid possible damage. Hand-excavate, as required, to minimize possibility of damage to underground utilities. Maintain grade stakes set by others until removal is mutually agreed upon by parties concerned.
- D. When conditions detrimental to sod or plant growth are encountered, such as rubble fill, adverse drainage condition, or other obstructions, notify the Owner's Representative before planting.

3.2 SOIL TESTING

- A. Coordinate soil testing in an expeditious and timely manner as required for on-site topsoil materials. Contract with a soil laboratory and include cost of sampling and testing in contract price. Take one (1) sample for every 5,000 square feet of landscape area up to a maximum of six (6) samples under the direction of and in the presence of the Owner's Representative.

- B. Submit each sample, according to the quantity of soil required by testing laboratory, to a competent laboratory approved by the Owner's Representative.
- C. Provide analysis of soil samples for pH, salinity, ammonia, phosphate, potassium, calcium, magnesium, boron, and sodium levels. Provide appraisal of chemical properties, including particle size determination, and recommendations for types and quantities of amendments and fertilizers.

3.3 PREPARATION

- A. Clearing of Vegetation:
 - 1. If live perennial weeds exist on site at the beginning of work, spray with a non-selective systemic contact herbicide as recommended and applied by an approved licensed landscape pest control advisor and applicator. Leave sprayed plants intact for at least 15 days.
 - 2. Clear and remove existing weeds by mowing or grubbing off all plant parts at least one-quarter inch ($\frac{1}{4}$ ") inch below surface of soil over entire areas to be planted.
- B. Soil preparation:
 - 1. Loosen soil in all planting areas, and on slopes flatter than 3:1 gradient, to a depth of six to eight inches (6" - 8") below finish grade. All debris, foreign matter, and stones shall be removed prior to the placing of any fertilizers or conditioners. Soil preparation is for all shrub planting beds and sodded lawn areas.
 - 2. Conduct the required soil tests and instruct the lab to include a minimum of the following soil improvements in the recommendation on the soils report.
 - a. Soil Amendment: Two cubic yards (2 cy) per 1,000 square feet.
 - b. Gro-Power Plus: One hundred fifty pounds (150 lbs) per 1,000 square feet.
 - c. If the lab recommends less than six cubic yards (6 cy) of soil amendment, the excess bid amount shall be applied to the cost of any additional recommended soil improvements, or returned to the Owner as a credit
 - 3. Apply amendments as follows, using rates recommended by the soils testing laboratory (the rates of amendments shown below are for bidding purposes only):
 - a. Fertilizer/Soil Conditioner: Broadcast 150 pounds of Gro Power Plus per 1,000 square feet in all planting areas and rototill to a depth of six to eight inches (6" - 8"). Remove from the site any rock and debris brought to the surface by cultivations. "Cultipack" all areas to receive sod.
 - b. Apply soil amendment to all planting areas at the rate of six cubic yards (6 cy) per 1,000 sf and rototill into the top six to eight inches (6" – 8").
 - 4. Upon completion of finish grading, request an review and obtain approval of Landscape Architect prior to commencement of planting.

LANDSCAPING
SECTION 32 9000
3595001

C. Finish Grading for all Planting areas

1. Refer to Earthwork Specification Section for Rough Grading.
2. Grade to elevations and contours shown on Drawings. Fill low spots with landscape backfill material and grade to surface drain in manner indicated on Drawings.
3. Finish-grade so that the entire area within the contract lines has a natural and pleasing appearance as specified and as directed by Landscape Architect.
4. Adjust sprinkler heads one-half inch above finish grade in preparation to receive sod. Reset sprinkler heads flush to grade after turf has germinated.
5. Flag the sprinkler heads and valve markers.

D. Planting Pits for Trees:

1. Excavate pits with vertical sides and with bottom of excavation slightly raised at center to provide proper drainage.
2. Set container-grown stock in center of pit on earth pedestal. Separate roots and/or prune roots as directed by Landscape Architect. In hot weather, pre-wet pit. Loosen outside roots from sides and bottom of root ball. When set, place additional backfill around base and sides of root ball. Work each layer to settle backfill and eliminate voids and air pockets. Water after placing final layer of backfill.
3. Loosen hard subsoil in bottom of excavation. Extend excavation as required to insure proper drainage from plant pits.
4. Fill excavated planting pits with water to half the depth of pit. Pits should drain within four hours (4 hrs). If planting pits do not drain, notify Project Inspector immediately. Do not proceed with planting until Landscape Architect has resolved a method to provide drainage.

E. Planting Pits for Shrubs/Groundcover:

1. Excavate pits and trenches with vertical sides and with bottom of excavation slightly raised at center to provide proper drainage.
2. Loosen hard subsoil in bottom of excavation. Extend excavation as required to insure proper drainage from plant pits.
3. Fill excavated planting pits with water to half the depth of pit. Pits should drain within four hours (4 hrs). If planting pits do not drain, notify Project Inspector immediately. Do not proceed with planting until Landscape Architect has resolved a method to provide drainage.

3.4 PLANTING

A. Lawn Sod:

1. Cultivate all lawn areas to a depth of six inches (6"). If cultivation does not break lumps, pull a spike-toothed harrow over the area behind the tractor.
2. Give all lawn areas that are to be sodded a smooth finish to prevent pockets. Do not allow any abrupt changes of surface. Prior to installation of sod, roll the grade with a 200-pound water-ballast roller. Request that the lawn grade be inspected and approved by the Landscape Architect prior to sodding to determine its suitability for planting. Obtain such approval prior to commencing sodding operations.
3. Do not take heavy objects (except lawn rollers) over lawn areas after they have been prepared for planting.
4. Completely lay the sod within twelve hours (12 hrs) of delivery. Do not leave sod on pallets in the hot sun longer than necessary.
5. Unroll sod carefully. Lay sod tight without any visible open joints, and without overlapping; stagger end joints twelve inches (12") minimum. Do not stretch or overlap sod pieces. Do not place sod in pieces smaller than twenty-four inches (24") in length by width of roll.
6. When new sod is to match existing turf, cut the edge of the existing turf in a series of straight lines that will accept new sod rolls in full width of the sod roll. Make the transition of grade between existing turf and new sod to be seamless with no change in elevation.
7. Immediately after laying sod, roll lawn areas with a 200-pound water-ballast roller.
8. Trim sod to conform to lawn shapes designated in Drawings.
9. On slopes of six inches (6") per foot and steeper, lay sod perpendicular to slope and secure every row with wooden pegs at a maximum of two feet (2') on center. Drive pegs flush with soil portion of sod.
10. Ensure that finished appearance is that of one continuous lawn.
11. Do not lay whole lawn before watering. When a conveniently large area has been sodded, water lightly to prevent drying. Continue to lay sod and to water until installation is complete.
12. All sod areas must be approved by Landscape Architect.
13. Water the complete lawn surface thoroughly. Moisten soil at least eight inches (8") deep. Repeat sprinkling at regular intervals to keep sod moist at all times until rooted. After sod is established, decrease frequency and increase amount of water per application as necessary.

LANDSCAPING
SECTION 32 9000
3595001

B. Shrubs:

1. Lay out individual shrub locations and areas for multiple plantings. Stake the locations, outline the areas, and secure the Owner's Representative's acceptance before beginning the planting work. Make minor adjustments as requested.
2. Scarify root ball prior to planting. Plant in holes twice the diameter of the root ball and to a depth equal to the container's height. Place the shrub and/or groundcover so the top of the root ball is one inch (1") higher than the surrounding grade. Set container-grown stock in center of pit. In hot weather, pre-wet the pit. When set, place additional backfill around base and sides of root ball. Work each layer to settle backfill and eliminate voids and air pockets. Thoroughly compact lower half of backfill in plant pit. See staking or guying detail. Water after planting. Provide a berm or watering basin for each tree. Add Vitamin B-1, in the proper solution as recommended by the manufacturer, to the second watering of the basin.
3. Place fertilizer planting tablets in root zone and alongside each plant. Follow manufacturer's instructions for number of tablets to use for each container size.
4. See Drawings for additional information.
5. Grooming and Staking of Trees:
 - a. Prune, thin-out and shape trees in accordance with standard horticultural practice. Prune trees to retain required height and spread. Unless otherwise directed by Landscape Architect, do not cut tree leaders, and remove only injured or dead branches from flowering trees.
 - b. Paint cuts over one-half inch ($\frac{1}{2}$ ") in size with standard tree paint or compound, covering exposed, living tissue. Use paint that is waterproof, antiseptic, adhesive, elastic and free of kerosene, coal tar, creosote, and other substances harmful to plants. Do not use shellac.
 - c. Stake or guy trees immediately after planting, as indicated on Drawings.
6. Grooming of Shrubs:
 - a. Prune, thin-out and shape shrubs in accordance with standard horticultural practice. Prune shrubs to retain natural character and to accomplish their use in landscape design. The required plant size is its size after pruning.
 - b. Remove and replace excessively pruned or malformed new plants resulting from improper pruning.

- C.** Request review by the Landscape Architect after locating, but prior to planting all trees. Under the direction of the Landscape Architect, make slight adjustments to plant material location as necessary to reflect original intention of Drawings.

3.5 WEED CONTROL

- A. Apply pre-emergent weed control to all planting areas (except lawn) after completion of all planting and one complete watering. Follow manufacturer's directions. To prevent washing away of weed control, do not over-water after its application. Do not allow any weed control into lawn areas. Treat any existing noxious weeds, such as Johnson grass, with Roundup in successive treatments until all roots are destroyed, then remove all grass and roots. Notify Owner's Representative of time of installation for verification of application.

3.6 BARK MULCH

- A. Apply mulch at the rate of three inches (3") deep to all planting areas, exclusive of lawn, after the planting and weed control are completed. Twelve inches (12") from planter edges, taper full depth of mulch to meet adjacent grades. Do not place mulch within three inches (3") of trunk or stems.

3.7 CLEAN-UP

- A. During construction, keep the site free of rubbish and debris, and clean up the site promptly when notified to do so. Take care to prevent spillage on streets from hauling and immediately clean up any such spillage and/or debris deposited on streets due to the work of this Section.
- B. During all phases of the construction work, take all precautions to abate dust nuisance by clean-up, sweeping, sprinkling with water, or other means as necessary.
- C. Paving: Maintain cleanliness of paving areas and other public areas used by equipment, and immediately remove spillage; remove rubbish, debris, and other material resulting from landscaping work, leaving site in a safe and clean condition.

3.8 LANDSCAPE MAINTENANCE

- A. The Landscape Maintenance Period will begin when all the Landscape Maintenance Period Requirements have been met (See Part 1 of these Specifications).
- B. Cleaning: Maintain cleanliness on paving areas and other public areas used by equipment and immediately remove all spillage. Remove from project site all rubbish and debris found thereon and all material and debris resulting from landscaping work, leaving the site in a safe and clean condition.
- C. Maintenance:
 - 1. Sprinkler Irrigation System:
 - a. Check system weekly for proper operation. Flush lateral lines out after removing last sprinkler head or two at each end of lateral. Adjust all heads as necessary for unimpeded coverage.

**LANDSCAPING
SECTION 32 9000
3595001**

- b. Set and program automatic controllers for seasonal water requirements. Provide the Owner's Representative with keys to the controllers and instructions on how to turn off system in case of emergency.
 - c. Repair all damages to sprinkler irrigation system as part of the contract work. Make repairs within one watering period or one week, whichever is the least amount of time.
2. Turf Areas:
- a. Begin mowing turf when grass has reached a height of three inches (3") and cut to a height of one-half inches to two inches (1 ½" - 2"). Mow at least weekly after the first cut. Turf must be well-established and free of bare spots and weeds, to satisfaction of Landscape Architect, prior to final acceptance. Do not mow lawns when the soil is not able to support maintenance equipment. Repair wheel marks and ruts caused by the maintenance equipment at no additional cost to the Owner.
 - b. Pick up grass clippings and remove from the site and premises.
 - c. Trim edges at least twice monthly for neat appearance. Vacuum or blow clippings off walks.
 - d. Water the lawns at such frequency as weather conditions require to replenish soil moisture below the root zone. Normally, a total of one and one-half inches (1 ½") of water is needed weekly in hot weather.
 - e. Fertilize the lawn areas at the beginning of the Landscape Maintenance Period and at the completion of the Landscape Maintenance Period. Use a fertilizer with the following characteristics:
 - 1) Slow release, Best 16-6-8, or approved equal, at the rate of 6.25 lbs per 1,000 square feet from March through October.
 - 2) Calcium Nitrate (15-0-0) at the rate of 6.5 lbs per 1,000 square feet from November through February.
 - f. Broadcast fertilizer using a mechanical spreader; do not apply by hand-broadcasting. Sweep all fertilizer off hardscape into adjacent planters.
 - g. Weekly as needed and as directed, re-sod lawn areas with material that matches previously installed material. Use sod to repair any bare areas. Repair areas to receive sod as follows:
 - 1) Mark out areas to receive new sod repair.
 - 2) Cut straight lines that will accept sod the full width of the roll and a minimum of twenty-four inches (24") in length.
 - 3) Transition the grade between existing turf and new sod seamlessly, with no change in elevation.

3. Shrubs:
 - a. Water enough that moisture penetrates throughout root zone and only as frequently as necessary to maintain healthy growth.
 - b. Construct and/or remove water basins around each plant, depending on the time of the year and as directed.
 - c. Do not prune unless directed by the Landscape Architect.
 - d. Replace any dead, dying or vandalized plant material on a weekly basis throughout the Landscape Maintenance Period.
 4. Insecticide and Herbicide Application:
 - a. If needed, control weeds with selective herbicides and sprays. In areas where crabgrass has infested the lawn, apply pre-emergent herbicides such as Dacthal by Amvac, Balan, or Betasan by Gowan for control prior to crabgrass germination. Control insect pests if necessary.
 - b. Use only a licensed Pest Control Operator to apply herbicides and sprays and to maintain a log for applications indicating material, timing, and rate.
- D. Final Acceptance of the Landscape Maintenance Period: request on-site meeting forty-eight hours (48 hrs.) in advance with the Landscape Architect and Owner's Representative to determine the end of the Landscape Maintenance Period.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Domestic water piping system.
 - 2. Fire protection piping systems.
 - 3. Sewer piping system

1.2 RELATED REQUIREMENTS

- A. Section 01 5000, Temporary Facilities and Controls.
- B. Section 01 6116, Volatile Organic Compound (VOC) Restrictions, for VOC limits pertaining to adhesives, sealants, fillers, primers, and coatings.
- C. Section 01 8113, Sustainable Design Requirements, for CAL-Green [and Collaborative for High Performance Schools (CHPS)] general requirements and procedures.
- D. Section 31 0000, Earthwork.
- E. Section 31 2333, Trenching and Backfilling.
- F. Section 32 1600, Site Concrete.

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CAL Green), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- C. California Plumbing Code, (CPC), edition as noted on the Drawings.
- D. California State Health and Safety Code Section 116875, Lead Free Public Water Systems.
- E. Local Jurisdiction: Any work within the street, highway or right-of-way shall be performed in accordance with the requirement of the governmental agencies having jurisdiction, and shall not begin until all of those governing authorities have been notified.
- F. ASTM International (ASTM):
 - 1. D422-63: Test Method for Particle Size Analysis of Soil.
 - 2. D698-00: Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures, Using 5.5 lb (2.49 Kg) Rammer and 12 inch (304.8 mm) Drop.

3. D1556-00: Test Method for Density of Soil in Place by the Sand-Cone Method.
4. D1557-02: Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 10 lb. (4.54 Kg) Rammer and 18 inch (457 mm) Drop.
5. D3017-05: Test Methods for Moisture Content of Soils and Soil-Aggregate Mixture by Nuclear Methods (Shallow Depth).
6. D4318-05: Test Method for Liquid Limit, Plastic Limit, and Plasticity Limit.

G. CALTRANS Standard Specifications.

H. CAL-OSHA, Title 8, Section 1590 (e).

I. NFPA 13, 24 and 25, per CFC chapter 80 and CBC chapter 35.

1.4 ADMINISTRATIVE REQUIREMENTS

A. Submittal Procedures:

1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
3. Sustainable Design Submittals shall comply with the additional requirements of Section 01 8113, Sustainable Design Requirements.

1.5 ACTION SUBMITTALS

- A. Provide supplier's descriptive literature for all products to demonstrate compliance with specified attributes.
- B. Substitution: Provide all data of proposed material being submitted as a substitution. Provide comparison with specified product data and identify all differences. Failure to provide comparison will be reason for rejection.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For contractor / installer.
- B. Provide sieve analysis from accredited testing lab on pipe bedding material. Analysis shall have a current date not older than project contract signing date.
- C. Sustainable Design:
1. General:
 - a. Submit information necessary to establish and document compliance with the California Green Building Standards Code.
 - b. Sustainable design submittals are in addition to other submittals.
 2. The following information shall be provided:
 - a. Adhesives and Sealants: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.

- b. Paints and Coatings: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.

1.7 CLOSEOUT SUBMITTALS

- A. Guarantee: Submit subcontractor's guarantee.
- B. Water Sterilization Test Report.

1.8 QUALITY ASSURANCE

- A. Contractor / Installer shall have been in business for five (5) years providing/finishing similar size projects and complexity.
- B. Contractor shall be solely responsible for all subgrades built. Any repairs resulting from inadequate compaction or incorrect grades will be the responsibility of the contractor.
- C. The representatives of the Owner's testing lab will not act as supervisor of construction, nor will they direct construction operations. Neither the presence of the Owner's testing lab representatives nor the testing by the Owner's testing lab shall excuse the contractors or subcontractors for defects or deficiencies discovered in their work during or following completion of the project. Correcting inadequate compaction is the sole responsibility of the contractor.
- D. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the drawings to be salvaged and re-used.
 - 1. Sun damaged or discolored PVC pipe will be rejected.
- E. All materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.

1.9 FEES, PERMITS, AND UTILITY SERVICES

- A. Obtain and pay for permits and service charges required for installation of Work. Arrange for required inspections and secure written approvals from authorities having jurisdiction.
- B. Upon completion of work within right-of-way, provide copies of written final approval to the Architect.

1.10 DELIVERY, STORAGE AND HANDLING

- A. Transport, store and handle in strict accord with the local jurisdiction and manufacturer's written recommendations
- B. Deliver undamaged products to job in manufacturer's sealed containers and/or original bundles with tags and labels intact.

1.11 EXISTING SITE CONDITIONS

- A. Contractor shall acquaint himself with all site conditions. If unknown active utilities are encountered during work, notify Architect promptly for instructions. Failure to notify will make Contractor liable for damage to these utilities arising from Contractor's operations subsequent to discovery of such unknown active utilities.
- B. Existing civil, mechanical and electrical improvements are shown on respective site plans to the extent known. Should the Contractor encounter any deviation between actual conditions and those shown, he is to immediately notify the Architect before continuing work.

1.12 PROTECTION

- A. Adequate protection measures shall be provided to protect workmen and passers-by on and off the site. Adjacent property shall be fully protected throughout the operations. Blasting will not be permitted. Prevent damage to adjoining improvements and properties both above and below grade. Restore such improvements to original condition should damage occur. Replace trees and shrubs outside building area disturbed by operations.
- B. In accordance with generally accepted construction practices, the Contractor shall be solely and completely responsible for working conditions at the job site, including safety of all persons and property during performance of the work. This requirement shall apply continuously and shall not be limited to normal working hours.
- C. Any construction review of the Contractor's performance conducted by the Geotechnical Engineer is not intended to include review of the adequacy of the Contractor's safety measures, in, on, or near the construction site.
- D. Provide shoring, sheeting, sheet piles and or bracing to prevent caving, erosion or gullyng of sides of excavation.
- E. Surface Drainage: Provide for surface drainage during period of construction in manner to avoid creating nuisance to adjacent areas. The contractor shall make a reasonable effort on a daily basis to provide pumps and all equipment necessary to keep all excavations and the site free from water during entire progress of work, regardless of cause, source, or nature of water.
- F. Adjacent streets and sidewalks shall be kept free of mud, dirt or similar nuisances resulting from earthwork operations.
- G. The site and adjacent influenced areas shall be watered as required to suppress dust nuisance. Dust control measures shall be in accordance with the local jurisdiction.
- H. Trees: Carefully protect existing trees that are to remain. Provide temporary irrigation as necessary to maintain health of trees.

1.13 SEASONAL LIMITS

- A. No fill material shall be placed, spread or rolled during unfavorable weather conditions. When work is interrupted by rains, fill operations shall not be resumed until field tests indicate that moisture content and density of fill are satisfactory.

1.14 RECORD DRAWINGS

- A. Keep a daily record of all pipe placed in ground, verified by Project Inspector.
- B. Upon completion of this Contract, furnish one tracing showing all outside utility lines, piping, etc., installed under this Contract. Locate and dimension all work with reference to permanent landmarks.
- C. All symbols and designations used in preparing "RECORD" drawings shall match those used in Contract drawings.
- D. Properly identify on as-builts and provide dimensions for all stubs for future connections. Provide concrete markers 6" dia. 12" deep, flush with finish grade at the ends of all stubbed pipes.
- E. Provide record drawings per Section 01 3300.

PART 2 - PRODUCTS

2.1 DESIGN AND PERFORMANCE CRITERIA

- A. Sustainable Design:
 - 1. VOC emissions for field-applied adhesives, sealants, and sealant primers must comply with limits specified in Section 01 6116.
 - 2. VOC emissions for field-applied paints and coatings must comply with limits specified in Section 01 6116.

2.2 MATERIALS - GENERAL

- A. Provide each item listed herein or shown on drawings of quality noted or approved equal. All material shall be new, full weight, standard in all respects and in first-class condition. Insofar as possible, all materials used shall be of same brand or manufacture throughout for each class of material or equipment. Materials shall be of domestic manufacture and shall be tested within Continental United States.
- B. Grade or quality of materials desired is indicated by trade names or catalog numbers stated herein.
- C. Dimensions, sizes, and capacities shown are minimum and shall not be changed without permission of Architect.
- D. All materials in this section used for any public water system or domestic water for human consumption shall be lead free.

1. For the purposes of this section, "lead free" means not more than 0.2 percent lead when used with respect to solder and flux and not more than 8 percent when used with respect to pipes and pipe fittings.
2. All pipe, pipe or plumbing fitting or fixtures, solder, or flux shall be certified by an independent American National Standards Institute (ANSI) accredited third party, including, but not limited to, NSF International, as being in compliance with this section.

E. All materials used for fire system piping shall be UL and FM approved.

2.3 VALVE BOXES

- A. Provide at each valve or cock in ground a Christy, Brooks, or equal to Christy G05CT, concrete valve box with cover marked for service, domestic water shall be marked "Water" and fire supply shall be marked "Fire". Furnish extension handles for each size square nut valve, and provide "fork" handle for each size of "wheel handle" valve as required. Do not locate valve boxes in walk, or covered passages, curbs, or curb & gutters, unless necessary. If valve location is within concrete or asphalt paved surface valve box shall be as detailed on plans for such condition. Provide valve box extensions as required to set bottom of valve box to bottom of piping in which valve is installed. Provide Owner with set of special wrenches and/or tools as required for operation of valves.

2.4 PIPES AND FITTINGS

- A. Sanitary Sewer: PVC sewer pipe and fittings with Ring-Tite joints, ASTM D3034 SDR35.
- B. Domestic water Lines 3 1/2" and smaller: Type K copper tubing, hard temper, with wrought copper fittings. Schedule 80 PVC, ASTM D 1784, ASTM D 1785.
- C. Water lines 4" and larger: AWWA C-900 Class 150/DR18 with rubber gasket joints.
- D. Fire lines 4" and larger: AWWA C-900 Class 200/DR14 with rubber gasket joints.
- E. Solder: Lead Free. 95/5; 95% Tin / 5% Antimony.
- F. Ductile Iron Pipe; AWWA Class 51, Cement Lined
- G. Ductile Iron Pipe Fittings; AWWA C110, C153, Ebba Iron, Star Romac, Sigma, or approved equal.
- H. PVC Mechanical Fittings; Ebba Iron, Star; Romac; Sigma or approved equal.
- I. Ductile Iron Pipe/PVC C-900 Pipe Restrained Fittings; Ebba Iron # 3800 Mega Coupling, Ebba Iron 1100CH Split Restrained Harness for pipe couplings. StarGrip Series 4000.
- J. Ductile Iron Pipe/PVC C900, C905 Restrained Degreedand Blind Cap Fittings,;
- K. Mega Lug; Sigma; Romac; or an approved equal

- L. Mechanical Fitting Bolts; Bolts and nuts shall be carbon steel with a minimum 60,000 psi tensile strength conforming to ASTM A 307, Grade A. Bolts shall be standard ANSI B1.1 Class 2A course threads. Nuts shall conform to ASTM A 563 and be standard ANSI B1.1, Class 2A course thread. All bolts and nuts shall be zinc coated.
- M. Fasteners Anti-Rust Coatings; After assembly, coat all fasteners with an Asphaltic Bituminous coatings conforming to latest edition NFPA 24.
- N. Ductile Iron Pipe Wrap; 8 mil polyethylene pipe wrap conforming to ANSI/AWWA C105/A21.5 standards.
- O. Pipe Insulation; Pipe exposed to atmospheric conditions ½" thru 4" NPT; Johns Manville rigid fiberglass insulation, Micro Lok HP; Owens Corning Fiberglas SSL II; Conforming to ASTM C 612, Type 1A or type 1B.
- P. Aluminum field applied pipe insulation jacket; comply with ASTM B209, ASTM C1729, ASTM C1371 Manufacturers; Childers Metals; ITW Insulation Systems Aluminum Jacketing; or an approved equal.
 - 1. Finish shall be flat mill finish
 - 2. Factory Fabricated Fitting Covers; 45 and 90 degree elbows, tee's, valve covers, end caps, unions, shall be of the same thickness and finish of jacket.
 - 3. The fittings shall be composed of 2-pieces
 - 4. Adhesives; per the manufacturers requirements
 - 5. Joint Sealant; shall be silicone, and shall be aluminum in color.
- Q. Sewer Forced Main; HDPE, DR 11, color gray with green stripe by JM Eagle or approved equal.

2.5 SANITARY SEWER MANHOLES

- A. Shall be constructed as shown on plan details.

2.6 CLEANOUTS

- A. Cleanouts of same diameter as pipe up to 8" in size shall be installed in all horizontal soil and waste lines where indicated and at all points of change in direction. Cleanouts shall be located not less than 18" from building so as to provide sufficient space for rodding. No horizontal run over 100 feet shall be without cleanout whether shown on drawings or not.
- B. All cleanout boxes shall be traffic rated with labeled lid, Christy G05CT or approved equal. Lid shall be vandal proof with stainless steel screws

2.7 UNIONS

- A. Furnish and install one union at each threaded or soldered connection to equipment and 2 unions, one on each side of valves on pipes ½" to 3".

- B. Locate unions so that piping can be easily disconnected for removal of equipment or valve. Provide type specified in following schedule:

Type of Pipe Union

Steel Pipe: 150 lb. Screwed malleable ground joint, brass, brass-to-iron seat, black or galvanized to match pipe.

Copper tubing: Brass ground joint with sweat connections.

PVC Sch 80 pipe: PVC union, FIPT X FIPT

2.8 VALVES

- A. Provide valves as shown and other valves necessary to segregate branches or units. Furnish valves suitable for service intended. Valves shall be properly packed and lubricated. Valves shall be non-rising stem. Place unions adjacent to each threaded or sweat fitting valve. Install valves with bonnets vertical. All valves shall be lead free.
- B. Valves ½" thru 2"; shall be made of bronze, full size of pipe and lead free. Nibco S-113-FL Series; American G-300 Series; Matco 511 FL Series; Apollo 102T-FL Series. Brass valves of brass parts within valves will not be accepted.
- C. Valves, 2 ½" thru 3" shall be class 150; Shall be made of bronze, full size of pipe; Jenkins Fig. 2310 J; Lunkinheimer Fig. 2153; Crane Fig. 437; Stockham Fig. B-128.
- D. Valves, Flanged; 4" thru 12" Ductile Iron Resilient Wedge Gate Valve; Nibco F 609 RW; American 2500 Series; Kennedy 8561; Mueller 2360 Series.

2.9 TAPPING SLEEVE

- A. Shall be used on pipe sizes 6" thru 12" and shall be made with stainless steel material including stainless steel bolts. Flanges shall be ductile iron or high carbon steel. Gaskets shall seal full circumference of pipe. Shall be manufactured for operating pressure of 200 psi, and shall pass test pressure of 300 psi. Romac SST series; Smithblair 662; Mueller H304; Ford "FAST" tapping sleeve.

2.10 SERVICE SADDLES

- A. Shall be used on pipe size 2" thru 4". Body shall be made from ductile iron with epoxy coating or bronze. Cascade Style CSC-1; A.Y. McDonald model 3891 AWWA/3892 FNPT; Smith-Blair #317; Ford S70, S71, S90, (style B).

2.11 TRACER WIRE

- A. No. 10 THW solid copper wire. Solder all joints

PART 3 - EXECUTION

3.1 DRAWINGS AND COORDINATION

- A. General arrangement and location of piping, etc., are shown on Drawings or herein specified. Install work in accord therewith, except for minor changes that may be necessary on account of other work or existing conditions. Before excavation, carefully examine other work that may conflict with this work. Install this work in harmony with other craft and at proper time to avoid delay of work.
- B. Verify invert elevations at points of connection to existing systems prior to any excavation. If invert elevations differ from that shown on drawings, notify Architect immediately.
- C. In advance of construction, work out minor changes if conflicts occur with electrical or mechanical. Relocate services to suit actual conditions and work of other trades to avoid conflict therewith. Any adjustments or additional fittings to make adjustments shall not be cause for additional costs to the owner.
- D. Execute any work or apparatus shown on drawings and not mentioned in specifications, or vice versa. Omission from Drawings or Specifications of any minor details of construction, installation, materials, or essential specialties does not relieve Contractor of furnishing same in place complete.
- E. Graded pipes shall take precedence. If conflict should occur while placing the domestic water and fire service piping, the contractor shall provide any and all fittings necessary to route the water lines over such conflicting pipes at no additional costs to the owner.

3.2 ACCESS

- A. Continuously check for clearance and accessibility of equipment or materials specified herein to be placed. No allowance of any kind shall be made for negligence on part of Contractor to foresee means of installing his equipment or materials into proper position.

3.3 EXCAVATING AND BACKFILLING

- A. Excavation and Bedding:
 - 1. General: Trench straight and true to line and grade with bottom smooth and free of irregularities or rock points. Trench width to be a minimum of 12" wider than outside diameter of pipe. Follow manufacturer's recommendations for use of each kind and type of pipe.
 - 2. Bedding: Provide a bedding as noted on drawing details for the full length of the pipe. Bedding shall have a minimum thickness beneath the pipe of 4" or 1/8 the outside diameter of the pipe, which ever is greater. Provide bell holes and depressions for pipe joints only of size required to properly make joint.
 - 3. If the trenches for the site utilities falls within areas to be lime treated, the piping shall be installed prior to any lime treatment operations, providing the elevation of the piping is below the treatment section.

UTILITIES
SECTION 33 0000
3595001000

- a. If trenching is necessary in areas that have been previously lime treated the contractor shall backfill the trench with class 2 aggregate base, with minimum section equal to the lime treated section and compacted to 95%.

B. Laying of Pipe:

- 1. General: Inspect pipe prior to placing. Sun damaged pipe will be rejected. Set aside any defective or damaged material. Do not place pipe in water nor place pipe when trenches or weather are unsuitable. Lay pipe bell up grade, true to line and grade.
 - a. Sewer pipe shall be laid in strict conformity to the prescribed line and grade, with grade bars set and each pipe length checked to the grade line. Three consecutive points on the same rate of slope shall be used at all times to detect any variation from a straight grade. In any case of discrepancy, work shall be stopped and the discrepancy immediately reported to the Owner's Representatives. In addition, when requested by the Owner's Representative, a string line shall be used in the bottom of the trench to insure a straight alignment of the sewer pipe between manholes. The maximum deviation from grade shall not be in excess of 1/4 inch. In returning the pipe to grade, no more than 1/4" depression shall result.
 - b. The Contractor shall expose the end of existing pipe to be extended, for verification of alignment and elevation, prior to trenching for any pipe which may be affected. All costs of such excavation and backfill shall be included in the price paid for the various items of work.
 - c. A temporary plug, mechanical type shall be installed on sewer pipe at the point of connection to existing facilities. If connecting to a public facility the plug shall conform to the requirements of the local jurisdiction. This plug shall remain in place until the completion of the balling and flushing operation.
- 2. Bell and Spigot Joints: Lubricate inside of bells and outside of spigots with soap solution. Wedge joints tight. Bell of bell and spigot pipe to be pointed up grade.

C. Backfilling:

- 1. General: Do not start backfill operations until required testing has been accomplished.
- 2. Compaction and Grading: Remainder of backfill shall be in accordance with Section 31 2333 – TRENCHING AND BACKFILLING.
- 3. If trenching in area previously lime or cement treated backfill top of trench section, same depth as lime or cement treatment with Class 2 Aggregate Base compacted to 95% minimum relative compaction.

3.4 INSTALLATION OF WATER PIPING

- A. Immediately cap or plug ends of, and opening in, pipe and fittings to exclude dirt until final connections made. Use reducing fittings where any change in pipe size occurs. Bushings shall not be used.

- B. General: Should existing conditions or other work prevent the running of pipes or the setting of equipment at the points indicated by drawings, changes as authorized by the Architect shall be made without additional cost to the Owner.
- C. All bolts used on mechanical fittings shall be thoroughly coated with an asphaltic bituminous coating conforming to 2019 NFPA (National Fire Protection Association) 10.3.5.2 and 10.8.3.5, CBC chapter 35 and CFC chapter 80.
- D. All buried metal shall be incased with 8 mil polyethylene wrap so that no soil is in contact with metal. Ends of polyethylene wrap shall be taped to provide seal with pipe.
- E. Do not install water lines in same trench with non-metallic sewer lines unless bottom of water pipe at all points is at least 12" above top of sewer line and water line is placed on solid shelf excavated at one side of common trench with a minimum of 12 inch horizontal separation.
- F. Under no circumstance shall a fitting be located directly under a structural footing without prior approval from the Architect.
- G. In locations where existing domestic pipe is rerouted, the new pipe shall be assembled using restrained fittings at all joints including factory pipe joints. Tapped restrained blind flanges shall be temporarily installed at each end of the assembled pipes until testing and chlorination is completed and approved.

3.5 CLOSING IN OF UNINSPECTED WORK

- A. Do not allow or cause work installed to be covered up or enclosed before it has been inspected, tested, and approved. Should work be enclosed or covered up before it has been approved, uncover work at own expense. After it has been inspected, tested and approved, make repairs necessary to restore work of other contractors to condition in which it was found at time of cutting.

3.6 CARE AND CLEANING

- A. Repair or replace broken, damaged, or otherwise defective parts, materials, and work. Leave entire work in new condition satisfactory to Architect. At completion, carefully clean and adjust equipment, fixtures and trim that are installed as part of this work. Leave systems and equipment in satisfactory new operating condition.
- B. Drain and flush piping to remove grease and foreign matter.
- C. Sewer piping shall be balled and flushed.
- D. Clean out and remove surplus materials and debris resulting from the work, including surplus excavated material.
- E. Flush fire service piping in the presence of the project inspector. Flushing shall be continued for a sufficient time as necessary to ensure all foreign material has been removed. Flow rate shall be equal to site fire flow requirements.

3.7 SEWER INTERNAL INSPECTIONS

- A. Upon completion of construction and prior to final inspection, the Contractor shall clean the entire new pipeline of all dirt and debris. Any dirt or debris in previously existing pipes or ditches in the area, which resulted from the new installation, shall also be removed. Pipes shall be cleaned by the controlled balling and flushing method. Temporary plugs shall be installed and maintained during cleaning operations at points of connection to existing facilities to prevent water, dirt, and debris from entering the existing facility.

3.8 TEST OF PIPING

- A. Pressure Test piping at completion of roughing-in, in accord with following schedule, and show no loss in pressure or visible leaks after minimum duration or four (4) hours at test pressures indicated.
- B. Chlorination tests shall be performed after all fixtures and any required mechanical devices are installed and the entire system is complete and closed up.
- C. In cases where new domestic water piping is assembled for re-routing of existing domestic water pipe, the contractor shall perform the following testing prior to connecting the new water pipe to the existing system.
 - 1. The pipe shall be pressure tested and per the test schedule.
 - 2. The pipe shall be pressure tested down within the trench.
 - 3. The contractor shall dig a temporary ditch below the existing pipe to drain to a sump that is lower than the bottom of the trench and to the side of the trench. The sump shall be 30% larger than the total volume of water within the testing pipe assembly.
 - 4. After pressure testing and chlorination has taken place and accepted, the contractor shall drain the pipe into the sump and pump the sump out as it is filling.
 - 5. The temporary test fittings at each end of the pipe assembly shall be removed and the final restrained couplings installed.
 - 6. The existing piping shall be cut and the water within the pipe shall drain below the pipe to the temporary sump. Pump the sump as it is being filled up. Take extreme caution not to contaminate the existing pipe with any contaminants within the trench.
 - 7. Before making the final coupling connections, the restrained couplings at each end of the new pipe shall be thoroughly swabbed inside the fitting with a solution of chlorine mixed with water at a rate of 1 part chlorine to 4 parts potable water.
 - 8. After final connections are made, a visual inspection shall be made after fittings are wiped off. If after 1 hr, no noticeable drips are noted the pipe can be backfilled.
 - 9. The contractor shall flush all water piping affected by chlorination until it is within acceptable levels approved by certified testing lab.

TEST SCHEDULE

<u>System Tested</u>	<u>Test Pressure PSIG Test With</u>
Public Water Mains	Per local jurisdiction requirements.
Private Domestic Water Piping:	150 Lbs. Water 4 hrs.
Fire Protection Piping:	200 Lbs. Water pressure, 4 hrs duration with no pressure loss.
Sanitary Sewer Piping:	Sewer system shall be tested for leakage per local jurisdiction requirements.

- D. Testing equipment, materials, and labor shall be furnished by contractor.

3.9 WATER SYSTEM STERILIZATION

- A. Public Water Mains: Shall be flushed and disinfected per the local jurisdiction requirements
- B. Clean and disinfect all site water systems connected to the domestic water systems in accordance with AWWA Standard C651 and as required by the local Building and Health Department Codes, and EPA.
 - 1. Clean and disinfect industrial water system in addition to the domestic water system.
 - 2. Disinfect existing piping systems as required to provide continuous disinfection upstream to existing valves. At Contractors option, valves may be provided to isolate the existing piping system from the new piping system.
- C. Domestic water sterilization shall be performed by a licensed “qualified applicator” as required by CAL-EPA Pesticide Enforcement Branch for disinfecting and sterilizing drinking water.
- D. Disinfecting Agent: Chlorine product that is a registered product with Cal-EPA for use in California potable water lines, such as Bacticide, CAL-EPA Registration No. 37982-20001.
- E. Contractor to provide a 1” service valve connected to the system at a point within 2’-0” of its junction with the water supply line. After sterilization is complete Contractor to provide cap at valve.
- F. Sterilization Procedure to be as follows:
 - 1. Flush pipe system by opening all outlets and letting water flow through the system until clear water flows from all outlets.

UTILITIES
SECTION 33 0000
3595001000

2. Inject disinfecting agent to provide a minimum chlorine residual concentration of at least 50 parts per million (ppm) of free chlorine at each outlet.
 3. Provide sign at all outlets which reads "Water Sterilization in Progress – Do not operate". Remove signs at conclusion of test.
 4. Close all outlets and valves, including valve connecting to water supply line and 1" service valve. Retain treated water in pipe for a minimum of twenty-four hours. Should chlorine residual at pipe extremities be less than 50 PPM at this time, pipe shall be re-chlorinated. As an option, the water systems may be filled with a water-chlorine solution containing a minimum of 200 PPM of chlorine and allowed to stand for three hours.
 5. After chlorination, flush lines of chlorinated water and refill from domestic supply. Continue flushing until residual chlorine is less than or equal to 0.2 ppm, or a residual the same as that of the test water.
- G. Chemical and bacteriological tests shall be conducted by a state-certified laboratory and approved by the local authorities having jurisdiction.
- H. Submit written report to Health Department as required by State Regulations. Provide a copy of report to Architect prior to completion of project.
- I. The costs of sterilization and laboratory testing shall be paid for by the contractor.

3.10 CLEANING

- A. Upon completion of work of this Section promptly remove from the working area all scraps, debris and surplus material of this Section.

END OF SECTION

s:\master specifications\division 33 - utilities\33 0000_utilities.docx
Formatting Updated: 9-13-21

PART 1 - GENERAL

1.1 SUMMARY

- A. Summary Includes:
 - 1. Storm drainage piping systems.

1.2 RELATED REQUIREMENTS

- A. Section 01 5000, Construction Facilities and Controls.
- B. Section 01 6116, Volatile Organic Compound (VOC) Restrictions, for VOC limits pertaining to adhesives, sealants, fillers, primers, and coatings.
- C. Section 01 8113, Sustainable Design Requirements, for CAL-Green general requirements and procedures
- D. Section 31 0000, Earthwork.
- E. Section 31 2333, Trenching and Backfilling.
- F. Section 32 1200, Asphalt Concrete Paving.
- G. Section 32 1600, Site Concrete

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CAL Green), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- C. California Plumbing Code, (CPC), edition as noted on the Drawings.
- D. Local Jurisdiction: Any work within the street, highway or right-of-way shall be performed in accordance with the requirement of the governmental agencies having jurisdiction, and shall not begin until all of those governing authorities have been notified.
- E. ASTM International (ASTM):
 - 1. D 422-63 Test Method for Particle Size Analysis of Soil.
 - 2. D698-00 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures, Using 5.5 lb (2.49 Kg) Rammer and 12 inch (304.8 mm) Drop.
 - 3. D1556-00 - Test Method for Density of Soil in Place by the Sand-Cone Method.
 - 4. D1557-02 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 10 lb. (4.54 Kg) Rammer and 18 inch (457 mm) Drop.

STORM DRAINAGE UTILITIES
SECTION 33 4000
3595001000

5. D 3017-05 Test Methods for Moisture Content of Soils and Soil-Aggregate Mixture by Nuclear Methods (Shallow Depth).
6. D 4318-05 Test Method for Liquid Limit, Plastic Limit, and Plasticity Limit.

F. CALTRANS Standard Specifications.

G. CAL-OSHA, Title 8, Section 1590 (e).

1.4 ADMINISTRATIVE REQUIREMENTS

A. Submittal Procedures:

1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
3. Sustainable Design Submittals shall comply with the additional requirements of Section 01 8113, Sustainable Design Requirements.

1.5 ACTION SUBMITTALS

- A. Provide supplier's descriptive literature for all products to demonstrate compliance with specified attributes.
- B. Substitution: Provide all data of proposed material being submitted as a substitution. Provide comparison with specified product data and identify all differences. Failure to provide comparison will be reason for rejection.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: Contractor / installer.
- B. Provide sieve analysis from accredited testing lab on pipe bedding material. Analysis shall have a current date not older than project contract signing date.
- C. Sustainable Design:
1. General:
 - a. Submit information necessary to establish and document compliance with the California Green Building Standards Code.
 - b. Sustainable design submittals are in addition to other submittals.
 2. The following information shall be provided:
 - a. Adhesives and Sealants: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.
 - b. Paints and Coatings: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.

1.7 CLOSEOUT SUBMITTALS

- A. Guarantee: Submit subcontractor's guarantee.

1.8 QUALITY ASSURANCE

- A. Contractor / Installer shall have been in business for five (5) years providing/finishing similar size projects and complexity.
- B. Contractor shall be solely responsible for all subgrades built. Any repairs resulting from inadequate compaction are the responsibility of the contractor.
- C. The representatives of the Owner's testing lab will not act as supervisor of construction, nor will they direct construction operations. Neither the presence of the Owner's testing lab representatives nor the testing by the Owner's testing lab shall excuse the contractors or subcontractors for defects discovered in their work during or following completion of the project. Correcting inadequate compaction is the sole responsibility of the contractor.
- D. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.
 - 1. Sun damaged or discolored PVC pipe will be rejected.
- E. All materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.

1.9 DELIVERY, STORAGE AND HANDLING

- A. Transport, store and handle in strict accord with the local jurisdiction and manufacturer's written recommendations
- B. Deliver undamaged products to job in manufacturer's sealed containers and/or original bundles with tags and labels intact.

1.10 EXISTING SITE CONDITIONS

- A. Contractor shall acquaint himself with all site conditions. If unknown active utilities are encountered during work, notify Architect promptly for instructions. Failure to notify will make Contractor liable for damage to these utilities arising from Contractor's operations subsequent to discovery of such unknown active utilities.
- B. Existing civil, mechanical and electrical improvements are shown on respective site plans to the extent known. Should the Contractor encounter any deviation between actual conditions and those shown, he is to immediately notify the Architect before continuing work.

1.11 PROTECTION

- A. Adequate protection measures shall be provided to protect workmen and passers-by on and off the site. Adjacent property shall be fully protected throughout the operations.

STORM DRAINAGE UTILITIES
SECTION 33 4000
3595001000

Blasting will not be permitted. Prevent damage to adjoining improvements and properties both above and below grade. Restore such improvements to original condition should damage occur. Replace trees and shrubs outside building area disturbed by operations.

- B. In accordance with generally accepted construction practices, the Contractor shall be solely and completely responsible for working conditions at the job site, including safety of all persons and property during performance of the work. This requirement shall apply continuously and shall not be limited to normal working hours.
- C. Any construction review of the Contractor's performance conducted by the Geotechnical Engineer is not intended to include review of the adequacy of the Contractor's safety measures, in, on, or near the construction site.
- D. Provide shoring, sheeting, sheet piles and/or bracing to prevent caving, erosion or gullyng of sides of excavation.
- E. Surface Drainage: Provide for surface drainage during period of construction in manner to avoid creating nuisance to adjacent areas. The contractor shall make a reasonable effort on a daily basis to provide pumps and all equipment necessary to keep all excavations and the site free from water during entire progress of work, regardless of cause, source, or nature of water.
- F. Adjacent streets and sidewalks shall be kept free of mud, dirt or similar nuisances resulting from earthwork operations.
- G. The site and adjacent influenced areas shall be watered as required to suppress dust nuisance. Dust control measures shall be in accordance with the local jurisdiction.
- H. Trees: Carefully protect existing trees that are to remain.

1.12 SEASONAL LIMITS

- A. No fill material shall be placed, spread or rolled during unfavorable weather conditions. When work is interrupted by rains, fill operations shall not be resumed until field tests indicate that moisture content and density of fill are satisfactory.

1.13 TESTING

- A. General: Refer to Section 01 4523 – Testing and Inspection Services, and Structural Tests and Inspections List, DSA-103.
- B. Geotechnical Engineer: Owner is retaining a Geotechnical Engineer to determine compliance of fill with Specifications, and to direct adjustments in fill operations. Costs of Geotechnical Engineer will be borne by Owner; except those costs incurred for re-tests or re-inspection will be paid by Owner and backcharged to Contractor.

1.14 RECORD DRAWINGS

- A. Keep a daily record of all pipe placed in ground, verified by Project Inspector.

STORM DRAINAGE UTILITIES
SECTION 33 4000
3595001000

- B. Upon completion of this Contract, furnish one tracing showing all outside utility lines, piping, etc., installed under this Contract. Locate and dimension all work with reference to permanent landmarks.
- C. All symbols and designations used in preparing "RECORD" drawings shall match those used in Contract drawings.
- D. Properly identify all stubs for future connections, as to location and use, by setting of concrete marker at finished grade in the manner suitable to Architect.

PART 2 - PRODUCTS

2.1 DESIGN AND PERFORMANCE CRITERIA

- A. Sustainable Design:
 - 1. VOC emissions for field-applied adhesives, sealants, and sealant primers must comply with limits specified in Section 01 6116.
 - 2. VOC emissions for field-applied paints and coatings must comply with limits specified in Section 01 6116.

2.2 MATERIALS

- A. Pipe: Use one of the following, unless noted on the Drawings otherwise.
 - 1. Polyvinyl Chloride Pipe (PVC): SDR35 conforming to ASTM D3034 with elastomeric joints conforming to ASTM D3212 for pipe to 12". Sun damaged pipe will be rejected.
 - 2. High density polyethylene pipe (HDPE): The pipe shall be corrugated exterior/smooth interior pipe. 12" to 60" maximum diameter shall conform to AASHTO M294, water tight per ASTM D3212 with water tight gasket fittings.
- B. Perforated Pipe (for subdrains): Shall be ADS N12 pipe, 3 hole, ASTM F 405, AASHTO M 252; PCV ASTM D3034 SDR-35 storm drain pipe
- C. Manhole: Shall be as shown on the drawing details.
- D. Drop Inlet: Shall be as shown on the drawing details.
- E. Curb Inlet: Shall be as shown on the drawing details.
- F. Mortar: For pipe connections to concrete drainage structures, conform to ASTM C270 type N mortar. Place within one half hour after adding water.
- G. Crushed Rock: Imported washed crushed rock. Minimum 100% passing 3/4 inch sieve.
- H. Trench drain: Polycast, Polydrain or equal and as shown on drawings.
- I. Area Drains: Shall be as shown on the drawing details.

STORM DRAINAGE UTILITIES
SECTION 33 4000
3595001000

- J. Floor Drains: Shall be as shown on the drawing details.
- K. Clean-outs: Shall be as shown on the drawing details.
- L. Planter drains: Shall be as detailed on the drawing details.
- M. Filter Fabric: Mirafi 140N.

PART 3 - EXECUTION

3.1 INSPECTION LAYOUT AND PREPARATION

- A. Prior to installation of the work of this Section, carefully inspect and verify by field measurements that installed work of all other trades is complete to the point where this installation may properly commence
- B. Layout all work, establish grades, locate existing underground utilities, set markers and stakes, setup and maintain barricades and protection facilities; all prior to beginning actual earthwork operations. Layout and staking shall be done by a licensed Land Surveyor or Professional Civil Engineer.
- C. Verify that specified items may be installed in accordance with the approved design.
- D. In event of discrepancy, immediately notify Owner and the Architect. Do not proceed in discrepant areas until discrepancies have been fully resolved.

3.2 EXCAVATION AND BACKFILLING

- A. General: Installation shall be in strict conformance with referenced standards, the manufacturer's written directions, as shown on the drawings and as herein specified.
- B. Verify invert elevations at points of connection to existing systems prior to any excavation. If invert elevations differ from that shown on drawings, notify Architect immediately.
- C. Excavation and Bedding:
 - 1. General: Trench straight and true to line and grade with bottom smooth and free of irregularities or rock points. Trench width in accordance with pipe manufacturer's recommendations and as per the drawings. Follow manufacturer's recommendations for use of each kind and type of pipe.
 - 2. Bedding: Provide bedding as detailed on plans for the full length of the pipe. Bedding shall have a minimum thickness beneath the pipe of 4" or 1/8 the outside diameter of the pipe, whichever is greater. Provide bell holes and depressions for pipe joints only of size required to properly make joint.
 - 3. If the trenches for the site drainage fall within areas to be lime treated, the piping shall be installed prior to any lime treatment operations.
 - a. If additional piping is added to previously lime treated areas, the contractor shall backfill the trench with class 2 aggregate base and compact to 95%.

STORM DRAINAGE UTILITIES
SECTION 33 4000
3595001000

D. Laying of Pipe:

1. General: Inspect pipe prior to placing. Set aside any defective or damaged material. Do not place pipe in water nor place pipe when trenches or weather are unsuitable. Lay pipe upgrade, true to line and grade.
2. Bell and Spigot Joints: Lubricate inside of bells and outside of spigots with soap solution or as recommended by manufacture. Wedge joints tight. Bell of bell and spigot pipe to be pointed upgrade.
3. Pipe shall be bedded uniformly throughout its length.
4. Pipe elevation shall be within 0.02 feet of design elevation as shown on plans.
5. Off Site Work: All work beyond the property lines shall be done in strict conformance with the requirements of the governing agency.

E. Backfilling:

1. General: Do not start backfill operations until required testing has been accomplished.
2. Trenches and Excavations: Backfill with material as detailed on plans, filling both sides of the pipe at the same time, carefully tamping to hold pipe in place without movement. Refer to Section 31 2333 – TRENCHING AND BACKFILLING for fill above this layer.

F. Grouting of Pipes: Grout pipes smooth and water tight at drop inlet, manholes, and curb inlets. Grout back side of hood at curb inlets all grouting shall be smooth and consistent.

G. Off Site Work: All work beyond the property lines shall be done in strict conformance with the requirements of the local agency.

H. Cutting and Patching: Remove and replace existing surface features per applicable specification section (i.e. asphaltic concrete or concrete paving) where pipe is installed in areas of existing improvements.

3.3 TOLERANCES

A. Storm Drain structure grates

1. In landscape and lawn areas $\pm 0.05'$.
2. In sidewalk and asphalt pavement $\pm 0.025'$.
3. In curb and gutter application $\pm 0.0125'$.

B. Cleanout Boxes and Lids

1. In landscape areas; 0.10 higher than surrounding finish grade, $\pm 0.05'$.
2. In sidewalks and asphalt pavement; Flush with surrounding finish grade, $\pm 0.025'$.

3.4 DEWATERING

A. Contractor to provide trench dewatering as necessary, no matter what the source is, at no additional cost to the owner.

STORM DRAINAGE UTILITIES
SECTION 33 4000
3595001000

3.5 FLUSHING

- A. The Contractor shall thoroughly ball and flush the storm drain system to remove all dirt and debris. Discharge water to an approved location.

3.6 CLEANING

- A. Upon completion of work of this Section promptly remove from the working area all scraps, debris and surplus material of this Section.
- B. Clean the dirt, rocks, and debris from the drop inlets and storm drain manholes.

END OF SECTION

**Villalovoz Elementary School - TK
Portable Classroom Building**

1550 Cypress Dr., Tracy, CA 95376

3595001

Tracy Unified School District

1875 W Lowell Ave., Tracy, CA 95376



February 14, 2024

Villalovoz Elementary School - TK Portable Classroom Building
Tracy Unified School District
Tracy, California

February 14, 2024

HMC # 3595001

DSA Appl. #02-122131
DSA File #39-73




Warren Consulting Engineers
Civil Engineer





Optimized Energy & Facilities Consulting
Electrical Engineer





MTW Group
Landscape Architect



TABLE OF CONTENTS

DIVISION 00 - PROCUREMENT AND CONTRACTING REQUIREMENTS - NOT USED

DIVISION 01 - GENERAL REQUIREMENTS

SECTION	01 1100 - Summary of Work
	01 2513 - Product Options and Substitutions
	01 2600 - Changes in the Work
	01 2900 - Application for Payment and Conditional and Unconditional Waiver and Release Forms
	01 3119 - Project Meetings
	01 3213 - Scheduling of Work
	01 3300 - Submittal Procedures (Including Submittal Transmittal, Substitution Request, RFI, Electronic Data Request, Megger Grounding Test Certificate, Certification of Chlorination and Sterilization, Certification of Compliance for Building Materials)
	01 3513.23 - Site Standards
	01 3543 - Environmental Procedures
	01 4100 - Regulatory Requirements
	01 4213 - Abbreviations and Acronyms
	01 4216 - Definitions
	01 4219 - References
	01 4300 - Materials and Equipment
	01 4523 - Testing and Inspection Services
	01 4500 - Quality Control
	01 5000 - Temporary Facilities and Controls
	01 5013 - Construction Waste Management and Disposal
	01 5213 - Field Offices
	01 6116 - Volatile Organic Compound (VOC) Restrictions
	01 6600 - Product Delivery Storage and Handling
	01 7329 - Cutting and Patching
	01 7600 - Alteration Project Procedures
	01 7700 - Contract Closeout and Final Cleaning
	01 7823 - Operation and Maintenance Data
	01 7836 - Warranties (Including Contractor Standard Warranty Form, Subcontractor Standard Warranty Form, Special Extended Warranty Form)
	01 7839 - Record Documents
	01 8113 - Sustainable Design Requirements

DIVISION 02 - EXISTING CONDITIONS - NOT USED

DIVISION 03 - CONCRETE - NOT USED

DIVISION 04 - MASONRY - NOT USED

DIVISION 05 - METALS - NOT USED

DIVISION 06 - WOOD, PLASTICS, AND COMPOSITES - NOT USED

DIVISION 07 - THERMAL AND MOISTURE PROTECTION

SECTION	07 9200 - Joint Sealants
---------	--------------------------

DIVISION 08 - OPENINGS - NOT USED

DIVISION 09 - FINISHES

SECTION	09 9100 - Painting
---------	--------------------

TABLE OF CONTENTS

DIVISION 10 - SPECIALTIES

SECTION	10 1116 - Markerboards
	10 1400 - Signage
	10 2813 - Toilet Accessories
	10 4416 - Fire Extinguishers and Cabinets

DIVISION 11 - EQUIPMENT - NOT USED

DIVISION 12 - FURNISHINGS

SECTION	12 2113 - Horizontal Louver Blinds
	12 3216 - Manufactured Plastic-Laminate-Clad Casework
	12 3623 - Plastic-Laminate-Clad Countertops

DIVISION 13 - SPECIAL CONSTRUCTION - NOT USED

DIVISION 14 - CONVEYING EQUIPMENT - NOT USED

DIVISION 21 - FIRE SUPPRESSION - NOT USED

DIVISION 22 - PLUMBING - NOT USED

DIVISION 23 - HEATING, VENTILATING AND AIR CONDITIONING (HVAC) - NOT USED

DIVISION 26 - ELECTRICAL

SECTION	26 0100 - Electrical Basic Requirements
	26 0533 - Raceway and Boxes for Electrical Systems
	26 2716 - Cabinets and Enclosures
	26 2800 - Circuit Protective Devices
	26 6116 - Fire Alarm

DIVISION 27 - COMMUNICATIONS

SECTION	27 1000 - Data Communications
	27 5123 - Sound and Communications

DIVISION 28 - ELECTRONIC SAFETY AND SECURITY

SECTION	28 3100 - Intrusion Alarm System
---------	----------------------------------

DIVISION 31 - EARTHWORK

SECTION	31 0000 - Earthwork
	31 2333 - Trenching and Backfilling

DIVISION 32 - EXTERIOR IMPROVEMENTS

SECTION	32 1200 - Asphalt Concrete Paving
	32 1600 - Site Concrete
	32 3113 - Chain Link Fences and Gates
	32 8000 - Irrigation
	32 9000 - Landscaping

TABLE OF CONTENTS

DIVISION 33 - UTILITIES

SECTION	33 0000 - Utilities
	33 4000 - Storm Drainage Utilities

"All rights reserved. This Project Manual or any part hereof may not be duplicated without the written consent of Rainforth Grau Architects except in the form of excerpts or quotations for the purpose of review."

SUMMARY OF WORK

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Site Access Conditions and Requirements;
- B. Special Conditions.

1.02 SUMMARY OF WORK COVERED BY CONTRACT DOCUMENTS

- A. The Work of this Contract consists of the following at Villalovoz Elementary School:
 - (1) Selective demolition and construction for preparation of the site to receive 1 - 36'x40' relocatable building, including associated civil, architectural and electrical work as indicated in the drawings.

1.03 CONTRACTS

- A. Perform the Work under a single, fixed-price Contract.

1.04 WORK BY OTHERS

- A. Construction of 1 - 36'x40' classroom building by portable manufacturer

1.05 CODES, REGULATIONS, AND STANDARDS

- A. The codes, regulations, and standards adopted by the state and federal agencies having jurisdiction shall govern minimum requirements for this Project. Where codes, regulations, and standards conflict with the Contract Documents, these conflicts shall be brought to the immediate attention of the District and the Architect.
- B. Codes, regulations, and standards shall be as published effective as of date of bid opening, unless otherwise specified or indicated.

1.06 PROJECT RECORD DOCUMENTS

- A. Contractor shall maintain on Site one set of the following record documents; Contractor shall record actual revisions to the Work:
 - (1) Contract Drawings.
 - (2) Specifications.

- (3) Addenda.
 - (4) Change Orders and other modifications to the Contract.
 - (5) Reviewed shop drawings, product data, and samples.
 - (6) Field test records.
 - (7) Inspection certificates.
 - (8) Manufacturer's certificates.
- B. Contractor shall store Record Documents separate from documents used for construction. Provide files, racks, and secure storage for Record Documents and samples.
 - C. Contractor shall record information concurrent with construction progress.
 - D. Specifications: Contractor shall legibly mark and record at each product section of the Specifications the description of the actual product(s) installed, including the following:
 - (1) Manufacturer's name and product model and number.
 - (2) Product substitutions or alternates utilized.
 - (3) Changes made by Addenda and Change Orders and written directives.

1.07 EXAMINATION OF EXISTING CONDITIONS

- A. Contractor shall be held to have examined the Project Site and acquainted itself with the conditions of the Site and of the streets or roads approaching the Site.
- B. Prior to commencement of Work, Contractor shall survey the Site and existing buildings and improvements to observe existing damage and defects such as cracks, sags, broken, missing or damaged glazing, other building elements and Site improvements, and other damage.
- C. Should Contractor observe cracks, sags, and other damage to and defects of the Site and adjacent buildings, paving, and other items not indicated in the Contract Documents, Contractor shall immediately report same to the District and the Architect.

1.08 CONTRACTOR'S USE OF PREMISES

- A. If unoccupied and only with District's prior written approval, Contractor may use the building(s) at the Project Site without limitation for its operations, storage, and office facilities for the performance of the Work. If the District chooses to beneficially occupy any building(s), Contractor must obtain the District's written approval for Contractor's use of spaces and types of operations to be performed within the building(s) while so occupied. Contractor's access to the building(s) shall be limited to the areas indicated.

- B. If the space at the Project Site is not sufficient for Contractor's operations, storage, office facilities and/or parking, Contractor shall arrange and pay for any additional facilities needed by Contractor.
- C. Contractor shall not interfere with use of or access to occupied portions of the building(s) or adjacent property.
- D. Contractor shall maintain corridors, stairs, halls, and other exit-ways of building clear and free of debris and obstructions at all times.
- E. No one other than those directly involved in the demolition and construction, or specifically designated by the District or the Architect shall be permitted in the areas of work during demolition and construction activities.
- F. The Contractor shall install the construction fence and maintain that it will be locked when not in use. Keys to this fencing will be provided to the District.

1.09 PROTECTION OF EXISTING STRUCTURES AND UTILITIES

- A. The Drawings show above-grade and below-grade structures, utility lines, and other installations that are known or believed to exist in the area of the Work. Contractor shall locate these existing installations before proceeding with excavation and other operations that could damage same; maintain them in service, where appropriate; and repair damage to them caused by the performance of the Work. Should damage occur to these existing installations, the costs of repair shall be at the Contractor's expense and made to the District's satisfaction.
- B. Contractor shall be alert to the possibility of the existence of additional structures and utilities. If Contractor encounters additional structures and utilities, Contractor will immediately report to the District for disposition of same as indicated in the General Conditions.

1.10 UTILITY SHUTDOWNS AND INTERRUPTIONS

- A. Contractor shall give the District a minimum of three (3) days written notice in advance of any need to shut off existing utility services or to effect equipment interruptions. The District will set exact time and duration for shutdown, and will assist Contractor with shutdown. Work required to re-establish utility services shall be performed by the Contractor.
- B. Contractor shall obtain District's written approval as indicated in the General Conditions in advance of deliveries of material or equipment or other activities that may conflict with District's use of the building(s) or adjacent facilities.

1.11 STRUCTURAL INTEGRITY

- A. Contractor shall be responsible for and supervise each operation and work that could affect structural integrity of various building elements, both permanent and temporary.
- B. Contractor shall include structural connections and fastenings as indicated or required for complete performance of the Work.

PART 2 – PRODUCTS Not Used.

PART 3 – EXECUTION Not Used.

END OF DOCUMENT

PRODUCT OPTIONS AND SUBSTITUTIONS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. Instructions to Bidders;
- B. General Conditions, including, without limitation, Substitutions For Specified Items; and
- C. Special Conditions.

1.02 SUBSTITUTIONS OF MATERIALS AND EQUIPMENT

- A. Catalog numbers and specific brands or trade names followed by the designation "or equal" are used in conjunction with material and equipment required by the Specifications to establish the standards of quality, utility, and appearance required. Substitutions which are equal in quality, utility, and appearance to those specified may be reviewed subject to the provisions of the General Conditions.
- B. Wherever more than one manufacturer's product is specified, the first-named product is the basis for the design used in the work and the use of alternative-named manufacturers' products or substitutes may require modifications in that design. If such alternatives are proposed by Contractor and are approved by the District and/or the Architect, Contractor shall assume all costs required to make necessary revisions and modifications of the design resulting from the substitutions requested by the Contractor.
- C. When materials and equipment are specified by first manufacturer's name and product number, second manufacturer's name and "or approved equal," supporting data for the second product, if proposed by Contractor, shall be submitted in accordance with the requirements for substitutions. The District's Board has found and determined that certain item(s) shall be used on this Project based on the purpose(s) indicated pursuant to Public Contract Code section 3400(c). These findings, as well as the products and brand or trade names, have been identified in the Notice to Bidders.
- D. The Contractor will not be allowed to substitute specified items unless the request for substitution is submitted as follows:
 - (1) District must receive any notice of request for substitution of a specified item a minimum of ten (10) calendar days prior to bid opening.

- (2) Within 35 days after the date of the Notice of Award, the Contractor shall submit data substantiating the request(s) for all substitution(s) containing sufficient information to assess acceptability of product or system and impact on Project, including, without limitation, the requirements specified in the Special Conditions and the technical Specifications. Insufficient information shall be grounds for rejection of substitution.
- E. If the District and/or Architect, in reviewing proposed substitute materials and equipment, require revisions or corrections to be made to previously accepted Shop Drawings and supplemental supporting data to be resubmitted, Contractor shall promptly do so. If any proposed substitution is judged by the District and/or Architect to be unacceptable, the specified material or equipment shall be provided.
- F. Samples may be required. Tests required by the District and/or Architect for the determination of quality and utility shall be made at the expense of Contractor, with acceptance of the test procedure first given by the District.
- G. In reviewing the supporting data submitted for substitutions, the District and/or Architect will use for purposes of comparison all the characteristics of the specified material or equipment as they appear in the manufacturer's published data even though all the characteristics may not have been particularly mentioned in the Contract Documents. If more than two (2) submissions of supporting data are required, the cost of reviewing the additional supporting data shall be borne by Contractor, and the District will deduct the costs from the Contract Price. The Contractor shall be responsible for any re-design costs occasioned by District's acceptance and/or approval of any substitute.
- H. The Contractor shall, in the event that a substitute is less costly than that specified, credit the District with one hundred percent (100%) of the net difference between the substitute and the originally specified material. In this event, the Contractor agrees to execute a deductive Change Order to reflect that credit. In the event Contractor furnishes a material, process, or article more expensive than that specified, the difference in the cost of that material, process, or article so furnished shall be borne by Contractor.
- I. In no event shall the District be liable for any increase in Contract Price or Contract Time due to any claimed delay in the evaluation of any proposed substitute or in the acceptance or rejection of any proposed substitute.

PART 2 – PRODUCTS Not Used.

PART 3 – EXECUTION Not Used.

END OF DOCUMENT

DOCUMENT 01 26 00

CHANGES IN THE WORK

CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE PROVISIONS IN THE AGREEMENT, GENERAL CONDITIONS, AND SPECIAL CONDITIONS, IF USED, RELATED TO CHANGES AND/OR REQUESTS FOR CHANGES.

END OF DOCUMENT

DOCUMENT 01 29 00

**APPLICATION FOR PAYMENT AND
CONDITIONAL AND UNCONDITIONAL WAIVER AND RELEASE FORMS**

**CONTRACTOR SHALL COMPLY WITH ALL PROVISIONS IN THE GENERAL
CONDITIONS RELATED TO APPLICATIONS FOR PAYMENT AND/OR PAYMENTS.**

**CONDITIONAL WAIVER AND RELEASE
ON PROGRESS PAYMENT
(CIVIL CODE SECTION 8132)**

NOTICE: THIS DOCUMENT WAIVES THE CLAIMANT'S LIEN, STOP PAYMENT NOTICE, AND PAYMENT BOND RIGHTS EFFECTIVE ON RECEIPT OF PAYMENT. A PERSON SHOULD NOT RELY ON THIS DOCUMENT UNLESS SATISFIED THAT THE CLAIMANT HAS RECEIVED PAYMENT.

Name of Claimant: _____

Name of Customer: _____

Job Location: _____

Owner: _____

Through Date: _____

Conditional Waiver and Release

This document waives and releases lien, stop payment notice, and payment bond rights the claimant has for labor and service provided, and equipment and material delivered, to the customer on this job through the Through Date of this document. Rights based upon labor or service provided, or equipment or material delivered, pursuant to a written change order that has been fully executed by the parties prior to the date that this document is signed by the claimant, are waived and released by this document, unless listed as an Exception below. This document is effective only on the claimant's receipt of payment from the financial institution on which the following check is drawn:

Maker of Check: _____

Amount of Check: \$_____

Check Payable to: _____

Exceptions

This document does not affect any of the following:

- (1) Retentions.
- (2) Extras for which the claimant has not received payment.
- (3) The following progress payments for which the claimant has previously given a conditional waiver and release but has not received payment:

Date(s) of waiver and release: _____

Amount(s) of unpaid progress payment(s): \$_____

TRACY UNIFIED SCHOOL DISTRICT

**APPLICATION FOR PAYMENT AND
CONDITIONAL AND UNCONDITIONAL
WAIVER AND RELEASE FORMS
DOCUMENT 01 29 00-2**

- (4) Contract rights, including (A) a right based on rescission, abandonment, or breach of contract, and (B) the right to recover compensation for work not compensated by the payment.

Claimant's Signature: _____

Claimant's Title: _____

Date of Signature: _____

**UNCONDITIONAL WAIVER AND RELEASE
ON PROGRESS PAYMENT
(CIVIL CODE SECTION 8134)**

NOTICE TO CLAIMANT: THIS DOCUMENT WAIVES AND RELEASES LIEN, STOP PAYMENT NOTICE, AND PAYMENT BOND RIGHTS UNCONDITIONALLY AND STATES THAT YOU HAVE BEEN PAID FOR GIVING UP THOSE RIGHTS. THIS DOCUMENT IS ENFORCEABLE AGAINST YOU IF YOU SIGN IT, EVEN IF YOU HAVE NOT BEEN PAID. IF YOU HAVE NOT BEEN PAID, USE A CONDITIONAL WAIVER AND RELEASE FORM.

Name of Claimant: _____

Name of Customer: _____

Job Location: _____

Owner: _____

Through Date: _____

Unconditional Waiver and Release

This document waives and releases lien, stop payment notice, and payment bond rights the claimant has for labor and service provided, and equipment and material delivered, to the customer on this job through the Through Date of this document. Rights based upon labor or service provided, or equipment or material delivered, pursuant to a written change order that has been fully executed by the parties prior to the date that this document is signed by the claimant, are waived and released by this document, unless listed as an Exception below. The claimant has received the following progress payment: \$_____

Exceptions

This document does not affect any of the following:

- (1) Retentions.
- (2) Extras for which the claimant has not received payment.
- (3) Contract rights, including (A) a right based on rescission, abandonment, or breach of contract, and (B) the right to recover compensation for work not compensated by the payment.

Claimant's Signature: _____

Claimant's Title: _____

Date of Signature: _____

**CONDITIONAL WAIVER AND RELEASE
ON FINAL PAYMENT
(CIVIL CODE SECTION 8136)**

NOTICE: THIS DOCUMENT WAIVES THE CLAIMANT'S LIEN, STOP PAYMENT NOTICE, AND PAYMENT BOND RIGHTS EFFECTIVE ON RECEIPT OF PAYMENT. A PERSON SHOULD NOT RELY ON THIS DOCUMENT UNLESS SATISFIED THAT THE CLAIMANT HAS RECEIVED PAYMENT.

Name of Claimant: _____

Name of Customer: _____

Job Location: _____

Owner: _____

Conditional Waiver and Release

This document waives and releases lien, stop payment notice, and payment bond rights the claimant has for labor and service provided, and equipment and material delivered, to the customer on this job. Rights based upon labor or service provided, or equipment or material delivered, pursuant to a written change order that has been fully executed by the parties prior to the date that this document is signed by the claimant, are waived and released by this document, unless listed as an Exception below. This document is effective only on the claimant's receipt of payment from the financial institution on which the following check is drawn:

Maker of Check:

Amount of Check: \$_____

Check Payable to: _____

Exceptions

This document does not affect any of the following: _____

Disputed claims for extras in the amount of: \$_____

Claimant's Signature: _____

Claimant's Title: _____

Date of Signature: _____

**UNCONDITIONAL WAIVER AND RELEASE
ON FINAL PAYMENT**
(CIVIL CODE SECTION 8138)

NOTICE TO CLAIMANT: THIS DOCUMENT WAIVES AND RELEASES LIEN, STOP PAYMENT NOTICE, AND PAYMENT BOND RIGHTS UNCONDITIONALLY AND STATES THAT YOU HAVE BEEN PAID FOR GIVING UP THOSE RIGHTS. THIS DOCUMENT IS ENFORCEABLE AGAINST YOU IF YOU SIGN IT, EVEN IF YOU HAVE NOT BEEN PAID. IF YOU HAVE NOT BEEN PAID, USE A CONDITIONAL WAIVER AND RELEASE FORM.

Name of Claimant: _____

Name of Customer: _____

Job Location: _____

Owner: _____

Unconditional Waiver and Release

This document waives and releases lien, stop payment notice, and payment bond rights the claimant has for all labor and service provided, and equipment and material delivered, to the customer on this job. Rights based upon labor or service provided, or equipment or material delivered, pursuant to a written change order that has been fully executed by the parties prior to the date that this document is signed by the claimant, are waived and released by this document, unless listed as an Exception below. The claimant has been paid in full.

Exceptions

This document does not affect any of the following: _____

Disputed claims for extras in the amount of: \$_____

Claimant's Signature: _____

Claimant's Title: _____

Date of Signature: _____

PROJECT MEETINGS

PART 1 – GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions; and
- B. Special Conditions.

1.02 PROGRESS MEETINGS:

- A. Contractor shall schedule and hold regular weekly progress meetings after a minimum of one week's prior written notice of the meeting date and time to all Invitees as indicated below.
- B. Location: Contractor's field office.
- C. The Contractor shall notify and invite the following entities ("Invitees"):
 - (1) District Representative.
 - (2) Contractor.
 - (3) Contractor's Project Manager.
 - (4) Contractor's Superintendent.
 - (5) Subcontractors, as appropriate to the agenda of the meeting.
 - (6) Suppliers, as appropriate to the agenda of the meeting.
 - (7) Construction Manager, if any.
 - (8) Architect
 - (9) Engineer(s), if any and as appropriate to the agenda of the meeting.
 - (10) Others, as appropriate to the agenda of the meeting.
- D. The District's and/or the Architect's Consultants will attend at their discretion, in response to the agenda.
- E. The District representative, the Construction Manager, and/or another District Agent shall take and distribute meeting notes to attendees and other concerned parties. If exceptions are taken to anything in the meeting notes,

those exceptions shall be stated in writing to the District within five (5) working days following District's distribution of the meeting notes.

1.03 PRE-INSTALLATION/PERFORMANCE MEETING:

- A. Contractor shall schedule a meeting prior to the start of each of the demolition work phases. Contractor shall invite all Invitees to this meeting, and others whose work may affect or be affected by the quality of the demolition work.
- B. Contractor shall review in detail prior to this meeting, the manufacturer's requirements and specifications, applicable portions of the Contract Documents, Shop Drawings, and other submittals, and other related work. At this meeting, invitees shall review and resolve conflicts, incompatibilities, or inadequacies discovered or anticipated.
- C. Contractor shall review in detail Project conditions, schedule, requirements for performance, application, installation, and quality of completed Work, and protection of adjacent Work and property.
- D. Contractor shall review in detail means of protecting the completed Work during the remainder of the construction period.

PART 2 - PRODUCTS Not Used.

PART 3 - EXECUTION Not Used.

END OF DOCUMENT

SCHEDULING OF WORK

PART 1 – GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions;
- B. Special Conditions;
- C. Summary of Work; and
- D. Submittals.

1.02 SECTION INCLUDES

- A. Scheduling of Work under this Contract shall be performed by Contractor in accordance with requirements of this Section.
 - (1) Development of schedule, cost and resource loading of the schedule, monthly payment requests, and project status reporting requirements of the Contract shall employ computerized Critical Path Method ("CPM") scheduling ("CPM Schedule").
 - (2) CPM Schedule shall be cost loaded based on Schedule of Values as approved by District.
 - (3) Submit schedules and reports as specified in the General Conditions.
- B. Upon Award of Contract, Contractor shall immediately commence development of Initial and Original CPM Schedules to ensure compliance with CPM Schedule submittal requirements.

1.03 CONSTRUCTION SCHEDULE

- A. Within ten (10) days of issuance of the issuance Notice to Proceed and before request for first progress payment, the Contractor shall prepare and submit to the Project Manager a construction progress schedule conforming to the Milestone Schedule below.
- B. The Construction Schedule shall be continuously updated, and an updated schedule shall be submitted with each application for progress payment. Each revised schedule shall indicate the work actually accomplished during the previous period and the schedule for completion of the remaining work.

C. Milestone Schedule:

ACTIVITY DESCRIPTION

REQUIRED COMPLETION

CONSTRUCTION STARTS

05-26-2022

PHASE 1 DEMOLITION

PHASE 2 DEMOLITION

FINAL PROJECT COMPLETION

1.04 QUALIFICATIONS

- A. Contractor shall employ experienced scheduling personnel qualified to use the latest version of [i.e., Primavera Project Planner]. Experience level required is set forth below. Contractor may employ such personnel directly or may employ a consultant for this purpose.
- (1) The written statement shall identify the individual who will perform CPM scheduling.
 - (2) Capability and experience shall be verified by description of construction projects on which individual has successfully applied computerized CPM.
 - (3) Required level of experience shall include at least two (2) projects of similar nature and scope with value not less than three fourths ($\frac{3}{4}$) of the Total Bid Price of this Project. The written statement shall provide contact persons for referenced projects with current telephone and address information.
- B. District reserves the right to approve or reject Contractor's scheduler or consultant at any time. District reserves the right to refuse replacing of Contractor's scheduler or consultant, if District believes replacement will negatively affect the scheduling of Work under this Contract.

1.05 GENERAL

- A. Progress Schedule shall be based on and incorporate milestone and completion dates specified in Contract Documents.
- B. Overall time of completion and time of completion for each milestone shown on Progress Schedule shall adhere to times in the Contract, unless an earlier (advanced) time of completion is requested by Contractor and agreed to by District. Any such agreement shall be formalized by a Change Order.
- (1) District is not required to accept an early completion schedule, i.e., one that shows an earlier completion date than the Contract Time.
 - (2) Contractor shall not be entitled to extra compensation in event agreement is reached on an earlier completion schedule and Contractor completes its Work, for whatever reason, beyond completion date shown in its early completion schedule but within the Contract Time.

- (3) A schedule showing the work completed in less than the Contract Time, and that has been accepted by District, shall be considered to have Project Float. The Project Float is the time between the scheduled completion of the work and the Completion Date. Project Float is a resource available to both District and the Contractor.
- C. Ownership Project Float: Neither the District nor Contractor owns Project Float. The Project owns the Project Float. As such, liability for delay of the Completion Date rests with the party whose actions, last in time, actually cause delay to the Completion Date.
 - (1) For example, if Party A uses some, but not all of the Project Float and Party B later uses remainder of the Project Float as well as additional time beyond the Project Float, Party B shall be liable for the time that represents a delay to the Completion Date.
 - (2) Party A would not be responsible for the time since it did not consume the entire Project Float and additional Project Float remained; therefore, the Completion Date was unaffected by Party A.
- D. Progress Schedule shall be the basis for evaluating job progress, payment requests, and time extension requests. Responsibility for developing Contract CPM Schedule and monitoring actual progress as compared to Progress Schedule rests with Contractor.
- E. Failure of Progress Schedule to include any element of the Work, or any inaccuracy in Progress Schedule, will not relieve Contractor from responsibility for accomplishing the Work in accordance with the Contract. District's acceptance of schedule shall be for its use in monitoring and evaluating job progress, payment requests, and time extension requests and shall not, in any manner, impose a duty of care upon District, or act to relieve Contractor of its responsibility for means and methods of construction.
- F. Software: Use [i.e, District Project Planner for Windows, latest version]. Such software shall be compatible with Windows operating system. Contractor shall transmit contract file to District on compact disk at times requested by District.
- G. Transmit each item under the form approved by District.
 - (1) Identify Project with District Contract number and name of Contractor.
 - (2) Provide space for Contractor's approval stamp and District's review stamps.
 - (3) Submittals received from sources other than Contractor will be returned to the Contractor without District's review.

1.06 INITIAL CPM SCHEDULE

- A. Initial CPM Schedule submitted for review at the pre-construction conference shall serve as Contractor's schedule for up to ninety (90) calendar days after the Notice to Proceed.

- B. Indicate detailed plan for the Work to be completed in first ninety (90) days of the Contract; details of planned mobilization of plant and equipment; sequence of early operations; procurement of materials and equipment. Show Work beyond ninety (90) calendar days in summary form.
- C. Initial CPM Schedule shall be time scaled.
- D. Initial CPM Schedule shall be cost and resource loaded. Accepted cost and resource loaded schedule will be used as basis for monthly progress payments until acceptance of the Original CPM Schedule. Use of Initial CPM Schedule for progress payments shall not exceed ninety (90) calendar days.
- E. District and Contractor shall meet to review and discuss the Initial CPM Schedule within seven (7) calendar days after it has been submitted to District.
 - (1) District's review and comment on the schedule shall be limited to Contract conformance (with sequencing, coordination, and milestone requirements).
 - (2) Contractor shall make corrections to schedule necessary to comply with Contract requirements and shall adjust schedule to incorporate any missing information requested by District. Contractor shall resubmit Initial CPM Schedule if requested by District.
- F. If, during the first ninety (90) days after Notice to Proceed, the Contractor is of the opinion that any of the Work included on its Initial CPM Schedule has been impacted, the Contractor shall submit to District a written Time Impact Evaluation ("TIE") in accordance with Article 1.12 of this Section. The TIE shall be based on the most current update of the Initial CPM Schedule.

1.07 ORIGINAL CPM SCHEDULE

- A. Submit a detailed proposed Original CPM Schedule presenting an orderly and realistic plan for completion of the Work in conformance with requirements as specified herein.
- B. Progress Schedule shall include or comply with following requirements:
 - (1) Time scaled, cost and resource (labor and major equipment) loaded CPM schedule.
 - (2) No activity on schedule shall have duration longer than fifteen (15) work days, with exception of submittal, approval, fabrication and procurement activities, unless otherwise approved by District.
 - (a) Activity durations shall be total number of actual work days required to perform that activity.
 - (3) The start and completion dates of all items of Work, their major components, and milestone completion dates, if any.

- (4) District furnished materials and equipment, if any, identified as separate activities.
- (5) Activities for maintaining Project Record Documents.
- (6) Dependencies (or relationships) between activities.
- (7) Processing/approval of submittals and shop drawings for all material and equipment required per the Contract. Activities that are dependent on submittal acceptance or material delivery shall not be scheduled to start earlier than expected acceptance or delivery dates.
 - (a) Include time for submittals, re-submittals and reviews by District. Coordinate with accepted schedule for submission of Shop Drawings, samples, and other submittals.
 - (b) Contractor shall be responsible for all impacts resulting from re-submittal of Shop Drawings and submittals.
- (8) Procurement of major equipment, through receipt and inspection at jobsite, identified as separate activity.
 - (a) Include time for fabrication and delivery of manufactured products for the Work.
 - (b) Show dependencies between procurement and construction.
- (9) Activity description; what Work is to be accomplished and where.
- (10) The total cost of performing each activity shall be total of labor, material, and equipment, excluding overhead and profit of Contractor. Overhead and profit of the General Contractor shall be shown as a separate activity in the schedule. Sum of cost for all activities shall equal total Contract value.
- (11) Resources required (labor and major equipment) to perform each activity.
- (12) Responsibility code for each activity corresponding to Contractor or Subcontractor responsible for performing the Work.
- (13) Identify the activities which constitute the controlling operations or critical path. No more than twenty-five (25%) of the activities shall be critical or near critical. Near critical is defined as float in the range of one (1) to (10) days.
- (14) Twenty (20) workdays for developing punch list(s), completion of punch-list items, and final clean up for the Work or any designated portion thereof. No other activities shall be scheduled during this period.
- (15) Interface with the work of other contractors, District, and agencies such as, but not limited to, utility companies.

- (16) Show detailed Subcontractor Work activities. In addition, furnish copies of Subcontractor schedules upon which CPM was built.
 - (a) Also furnish for each Subcontractor, as determined by District, submitted on Subcontractor letterhead, a statement certifying that Subcontractor concurs with Contractor's Original CPM Schedule and that Subcontractor's related schedules have been incorporated, including activity duration, cost and resource loading.
 - (b) Subcontractor schedules shall be independently derived and not a copy of Contractor's schedule.
 - (c) In addition to Contractor's schedule and resource loading, obtain from electrical, mechanical, and plumbing Subcontractors, and other Subcontractors as required by District, productivity calculations common to their trades, such as units per person day, feet of pipe per day per person, feet of wiring per day per person, and similar information.
 - (d) Furnish schedule for Contractor/Subcontractor CPM schedule meetings which shall be held prior to submission of Original CPM schedule to District. District shall be permitted to attend scheduled meetings as an observer.
- (17) Activity durations shall be in Work days.
- (18) Submit with the schedule a list of anticipated non-Work days, such as weekends and holidays. The Progress Schedule shall exclude in its Work day calendar all non-Work days on which Contractor anticipates critical Work will not be performed.
- C. Original CPM Schedule Review Meeting: Contractor shall, within sixty (60) days from the Notice to Proceed date, meet with District to review the Original CPM Schedule submittal.
 - (1) Contractor shall have its Project Manager, Project Superintendent, Project Scheduler, and key Subcontractor representatives, as required by District, in attendance. The meeting will take place over a continuous one (1) day period.
 - (2) District's review will be limited to submittal's conformance to Contract requirements including, but not limited to, coordination requirements. However, review may also include:
 - (a) Clarifications of Contract Requirements.
 - (b) Directions to include activities and information missing from submittal.
 - (c) Requests to Contractor to clarify its schedule.

- (3) Within five (5) days of the Schedule Review Meeting, Contractor shall respond in writing to all questions and comments expressed by District at the Meeting.

1.08 ADJUSTMENTS TO CPM SCHEDULE

- A. Adjustments to Original CPM Schedule: Contractor shall have adjusted the Original CPM Schedule submittal to address all review comments from original CPM Schedule review meeting and resubmit network diagrams and reports for District's review.
 - (1) District, within ten (10) days from date that Contractor submitted the revised schedule, will either:
 - (a) Accept schedule and cost and resource loaded activities as submitted, or
 - (b) Advise Contractor in writing to review any part or parts of schedule which either do not meet Contract requirements or are unsatisfactory for District to monitor Project's progress, resources, and status or evaluate monthly payment request by Contractor.
 - (2) District may accept schedule with conditions that the first monthly CPM Schedule update be revised to correct deficiencies identified.
 - (3) When schedule is accepted, it shall be considered the "Original CPM Schedule" which will then be immediately updated to reflect the current status of the work.
 - (4) District reserves right to require Contractor to adjust, add to, or clarify any portion of schedule which may later be discovered to be insufficient for monitoring of Work or approval of partial payment requests. No additional compensation will be provided for such adjustments, additions, or clarifications.
- B. Acceptance of Contractor's schedule by District will be based solely upon schedule's compliance with Contract requirements.
 - (1) By way of Contractor assigning activity durations and proposing sequence of Work, Contractor agrees to utilize sufficient and necessary management and other resources to perform work in accordance with the schedule.
 - (2) Upon submittal of schedule update, updated schedule shall be considered "current" CPM Schedule.
 - (3) Submission of Contractor's schedule to District shall not relieve Contractor of total responsibility for scheduling, sequencing, and pursuing Work to comply with requirements of Contract Documents, including adverse effects such as delays resulting from ill-timed Work.

- C. Submittal of Original CPM Schedule, and subsequent schedule updates, shall be understood to be Contractor's representation that the Schedule meets requirements of Contract Documents and that Work shall be executed in sequence indicated on the schedule.
- D. Contractor shall distribute Original CPM Schedule to Subcontractors for review and written acceptance, which shall be noted on Subcontractors' letterheads to Contractor and transmitted to District for the record.

1.09 MONTHLY CPM SCHEDULE UPDATE SUBMITTALS

- A. Following acceptance of Contractor's Original CPM Schedule, Contractor shall monitor progress of Work and adjust schedule each month to reflect actual progress and any anticipated changes to planned activities.
 - (1) Each schedule update submitted shall be complete, including all information requested for the Original CPM Schedule submittal.
 - (2) Each update shall continue to show all Work activities including those already completed. These completed activities shall accurately reflect "as built" information by indicating when activities were actually started and completed.
- B. A meeting will be held on approximately the twenty-fifth (25th) of each month to review the schedule update submittal and progress payment application.
 - (1) At this meeting, at a minimum, the following items will be reviewed: Percent (%) complete of each activity; Time Impact Evaluations for Change Orders and Time Extension Request; actual and anticipated activity sequence changes; actual and anticipated duration changes; and actual and anticipated Contractor delays.
 - (2) These meetings are considered a critical component of overall monthly schedule update submittal and Contractor shall have appropriate personnel attend. At a minimum, these meetings shall be attended by Contractor's General Superintendent and Scheduler.
 - (3) Contractor shall plan on the meeting taking no less than four (4) hours.
- C. Within five (5) working days after monthly schedule update meeting, Contractor shall submit the updated CPM Schedule update.
- D. Within five (5) work days of receipt of above noted revised submittals, District will either accept or reject monthly schedule update submittal.
 - (1) If accepted, percent (%) complete shown in monthly update will be basis for Application for Payment by the Contractor. The schedule update shall be submitted as part of the Contractor's Application for Payment.

- (2) If rejected, update shall be corrected and resubmitted by Contractor before the Application for Payment is submitted.
- E. Neither updating, changing or revising of any report, curve, schedule, or narrative submitted to District by Contractor under this Contract, nor District's review or acceptance of any such report, curve, schedule or narrative shall have the effect of amending or modifying in any way the Completion Date or milestone dates or of modifying or limiting in any way Contractor's obligations under this Contract.

1.10 SCHEDULE REVISIONS

- A. Updating the Schedule to reflect actual progress shall not be considered revisions to the Schedule. Since scheduling is a dynamic process, revisions to activity durations and sequences are expected on a monthly basis.
- B. To reflect revisions to the Schedule, the Contractor shall provide District with a written narrative with a full description and reasons for each Work activity revised. For revisions affecting the sequence of work, the Contractor shall provide a schedule diagram which compares the original sequence to the revised sequence of work. The Contractor shall provide the written narrative and schedule diagram for revisions two (2) working days in advance of the monthly schedule update meeting.
- C. Schedule revisions shall not be incorporated into any schedule update until the revisions have been reviewed by District. District may request further information and justification for schedule revisions and Contractor shall, within three (3) days, provide District with a complete written narrative response to District's request.
- D. If the Contractor's revision is still not accepted by District, and the Contractor disagrees with District's position, the Contractor has seven (7) calendar days from receipt of District's letter rejecting the revision to provide a written narrative providing full justification and explanation for the revision. The Contractor's failure to respond in writing within seven (7) calendar days of District's written rejection of a schedule revision shall be contractually interpreted as acceptance of District's position, and the Contractor waives its rights to subsequently dispute or file a claim regarding District's position.
- E. At District's discretion, the Contractor can be required to provide Subcontractor certifications of performance regarding proposed schedule revisions affecting said Subcontractors.

1.11 RECOVERY SCHEDULE

- A. If the Schedule Update shows a completion date twenty-one (21) calendar days beyond the Contract Completion Date, or individual milestone completion dates, the Contractor shall submit to District the proposed revisions to recover the lost time within seven (7) calendar days. As part of this submittal, the Contractor shall provide a written narrative for each revision made to recapture the lost time. If the revisions include sequence changes, the Contractor shall provide a schedule diagram comparing the original sequence to the revised sequence of work.

- B. The revisions shall not be incorporated into any schedule update until the revisions have been reviewed by District.
- C. If the Contractor's revisions are not accepted by District, District and the Contractor shall follow the procedures in paragraph 1.09.C, 1.09.D and 1.09.E above.
- D. At District's discretion, the Contractor can be required to provide Subcontractor certifications for revisions affecting said Subcontractors.

1.12 TIME IMPACT EVALUATION ("TIE") FOR CHANGE ORDERS, AND OTHER DELAYS

- A. When Contractor is directed to proceed with changed Work, the Contractor shall prepare and submit within fourteen (14) calendar days from the Notice to Proceed a TIE which includes both a written narrative and a schedule diagram depicting how the changed Work affects other schedule activities. The schedule diagram shall show how the Contractor proposes to incorporate the changed Work in the schedule and how it impacts the current schedule-update critical path. The Contractor is also responsible for requesting time extensions based on the TIE's impact on the critical path. The diagram must be tied to the main sequence of schedule activities to enable District to evaluate the impact of changed Work to the scheduled critical path.
- B. Contractor shall be required to comply with the requirements of Paragraph 1.09.A for all types of delays such as, but not limited to, Contractor/Subcontractor delays, adverse weather delays, strikes, procurement delays, fabrication delays, etc.
- C. Contractor shall be responsible for all costs associated with the preparation of TIEs, and the process of incorporating them into the current schedule update. The Contractor shall provide District with four (4) copies of each TIE.
- D. Once agreement has been reached on a TIE, the Contract Time will be adjusted accordingly. If agreement is not reached on a TIE, the Contract Time may be extended in an amount District allows, and the Contractor may submit a claim for additional time claimed by contractor.

1.13 TIME EXTENSIONS

- A. The Contractor is responsible for requesting time extensions for time impacts that, in the opinion of the Contractor, impact the critical path of the current schedule update. Notice of time impacts shall be given in accord with the General Conditions.
- B. Where an event for which District is responsible impacts the projected Completion Date, the Contractor shall provide a written mitigation plan, including a schedule diagram, which explains how (e.g., increase crew size, overtime, etc.) the impact can be mitigated. The Contractor shall also include a detailed cost breakdown of the labor, equipment, and material the Contractor would expend to mitigate District-caused time impact. The Contractor shall submit its mitigation plan to District within fourteen (14)

calendar days from the date of discovery of the impact. The Contractor is responsible for the cost to prepare the mitigation plan.

- C. Failure to request time, provide TIE, or provide the required mitigation plan will result in Contractor waiving its right to a time extension and cost to mitigate the delay.
- D. No time will be granted under this Contract for cumulative effect of changes.
- E. District will not be obligated to consider any time extension request unless the Contractor complies with the requirements of Contract Documents.
- F. Failure of the Contractor to perform in accordance with the current schedule update shall not be excused by submittal of time extension requests.
- G. If the Contractor does not submit a TIE within the required fourteen (14) calendar days for any issue, it is mutually agreed that the Contractor does not require a time extension for said issue.

1.14 SCHEDULE REPORTS

- A. Submit four (4) copies of the following reports with the Initial CPM Schedule, the Original CPM Schedule, and each monthly update.
- B. Required Reports:
 - (1) Two activity listing reports: one sorted by activity number and one by total Project Float. These reports shall also include each activity's early/late and actual start and finish dates, original and remaining duration, Project Float, responsibility code, and the logic relationship of activities.
 - (2) Cost report sorted by activity number including each activity's associated cost, percentage of Work accomplished, earned value- to date, previous payments, and amount earned for current update period.
 - (3) Schedule plots presenting time-scaled network diagram showing activities and their relationships with the controlling operations or critical path clearly highlighted.
 - (4) Cash flow report calculated by early start, late start, and indicating actual progress. Provide an exhibit depicting this information in graphic form.
 - (5) Planned versus actual resource (i.e., labor) histogram calculated by early start and late start.
- C. Other Reports:

In addition to above reports, District may request, from month to month, any two of the following reports. Submit four (4) copies of all reports.

- (1) Activities by early start.
 - (2) Activities by late start.
 - (3) Activities grouped by Subcontractors or selected trades.
 - (4) Activities with scheduled early start dates in a given time frame, such as fifteen (15) or thirty (30) day outlook.
- D. Furnish District with report files on compact disks containing all schedule files for each report generated.

1.15 PROJECT STATUS REPORTING

- A. In addition to submittal requirements for CPM scheduling identified in this Section, Contractor shall provide a monthly project status report (i.e., written narrative report) to be submitted in conjunction with each CPM Schedule as specified herein. Status reporting shall be in form specified below.
- B. Contractor shall prepare monthly written narrative reports of status of Project for submission to District. Written status reports shall include:
- (1) Status of major Project components (percent (%) complete, amount of time ahead or behind schedule) and an explanation of how Project will be brought back on schedule if delays have occurred.
 - (2) Progress made on critical activities indicated on CPM Schedule.
 - (3) Explanations for any lack of work on critical path activities planned to be performed during last month.
 - (4) Explanations for any schedule changes, including changes to logic or to activity durations.
 - (5) List of critical activities scheduled to be performed next month.
 - (6) Status of major material and equipment procurement.
 - (7) Any delays encountered during reporting period.
 - (8) Contractor shall provide printed report indicating actual versus planned resource loading for each trade and each activity. This report shall be provided on weekly and monthly basis.
 - (a) Actual resource shall be accumulated in field by Contractor, and shall be as noted on Contractor's daily reports. These reports will be basis for information provided in computer-generated monthly and weekly printed reports.
 - (b) Contractor shall explain all variances and mitigation measures.

- (9) Contractor may include any other information pertinent to status of Project. Contractor shall include additional status information requested by District at no additional cost.
- (10) Status reports, and the information contained therein, shall not be construed as claims, notice of claims, notice of delay, or requests for changes or compensation.

1.16 WEEKLY SCHEDULE REPORT

At the Weekly Progress Meeting, the Contractor shall provide and present a time-scaled three (3) week look-ahead schedule that is based and correlated by activity number to the current schedule (i.e., Initial, Original CPM, or Schedule Update).

1.17 DAILY CONSTRUCTION REPORTS

On a daily basis, Contractor shall submit a daily activity report to District for each workday, including weekends and holidays when worked. Contractor shall develop the daily construction reports on a computer-generated database capable of sorting daily Work, manpower, and man-hours by Contractor, Subcontractor, area, sub-area, and Change Order Work. Upon request of District, furnish computer disk of this data base. Obtain District's written approval of daily construction report data base format prior to implementation. Include in report:

- A. Project name and Project number.
- B. Contractor's name and address.
- C. Weather, temperature, and any unusual site conditions.
- D. Brief description and location of the day's scheduled activities and any special problems and accidents, including Work of Subcontractors. Descriptions shall be referenced to CPM scheduled activities.
- E. Worker quantities for its own Work force and for Subcontractors of any tier.
- F. Equipment, other than hand tools, utilized by Contractor and Subcontractors.

1.18 PERIODIC VERIFIED REPORTS

Contractor shall complete and verify construction reports on a form prescribed by the Division of the State Architect and file reports on the first day of February, May, August, and November during the preceding quarter year; at the completion of the Contract; at the completion of the Work; at the suspension of Work for a period of more than one (1) month; whenever the services of Contractor or any of Contractor's Subcontractors are terminated for any reason; and at any time a special verified report is required by the Division of the State Architect. Refer to section 4-336 and section 4-343 of Part 1, Title 24 of the California Code of Regulations.

PART 2 – PRODUCTS Not Used.

PART 3 - EXECUTION Not Used.

END OF DOCUMENT

SUBMITTALS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Contractor's Submittals and Schedules, Drawings and Specifications;
- B. Special Conditions.

1.02 SECTION INCLUDES:

- A. Definitions:
 - (1) Shop Drawings and Product Data are as indicated in the General Conditions and include, but are not limited to, fabrication, erection, layout and setting drawings, formwork and falsework drawings, manufacturers' standard drawings, descriptive literature, catalogues, brochures, performance and test data, wiring and control diagrams. In addition, there are other drawings and descriptive data pertaining to materials, equipment, piping, duct and conduit systems, and methods of construction as may be required to show that the materials, equipment or systems and all positions conform to the requirement of the Contract Documents, including, without limitation, the Drawings.
 - (2) "Manufactured" applies to standard units usually mass-produced; "fabricated" means specifically assembled or made out of selected materials to meet design requirements. Shop Drawings shall establish the actual detail of manufactured or fabricated items, indicated proper relation to adjoining work and amplify design details of mechanical and electrical equipment in proper relation to physical spaces in the structure.
 - (3) Manufacturer's Instructions: Where any item of Work is required by the Contract Documents to be furnished, installed, or performed, at a minimum, in accordance with a specified product manufacturer's instructions, the Contractor shall procure and distribute copies of these to the District, the Architect, and all other concerned parties and shall furnish, install, or perform the work, at a minimum, in accordance with those instructions.
- B. Samples, Shop Drawings, Product Data, and other items as specified, in accordance with the following requirements:
 - (1) Contractor shall submit all Shop Drawings, Product Data, and Samples to the District, the Architect, the Project Inspector, and the Construction Manager.

Contractor to review section
01 3300 as well as this
document

- (2) Contractor shall comply with all time frames herein and in the General Conditions and, in any case, shall submit required information in sufficient time to permit proper consideration and action before ordering any materials or items represented by such Shop Drawings, Product Data, and/or Samples.
- (3) Contractor shall allow sufficient time so that no delay occurs due to required lead time in ordering or delivery of any item to the Site. Contractor shall be responsible for any delay in progress of Work due to its failure to observe these requirements.
- (4) Time for completion of Work shall not be extended on account of Contractor's failure to promptly submit Shop Drawings, Product Data, and/or Samples.
- (5) Reference numbers on Shop Drawings shall have Architectural and/or Engineering Contract Drawings reference numbers for details, sections, and "cuts" shown on Shop Drawings. These reference numbers shall be in addition to any numbering system that Contractor chooses to use or has adopted as standard.
- (6) When the magnitude or complexity of submittal material prevents a complete review within the stated time frame, Contractor shall make this submittal in increments to avoid extended delays.
- (7) Contractor shall certify on submittals for review that submittals conform to Contract requirements. Also certify that Contractor-furnished equipment can be installed in allocated space. In event of any variance, Contractor shall specifically state in transmittal and on Shop Drawings, portions vary and require approval of a substitute. Submittals shall not be used as a means of requesting a substitution.
- (8) Unless specified otherwise, sampling, preparation of samples, and tests shall be in accordance with the latest standard of the American Society for Testing and Materials.
- (9) Upon demand by Architect or District, Contractor shall submit samples of materials and/or articles for tests or examinations and consideration before Contractor incorporates same in Work. Contractor shall be solely responsible for delays due to sample(s) not being submitted in time to allow for tests. Acceptance or rejection will be expressed in writing. Work shall be equal to approved samples in every respect. Samples that are of value after testing will remain the property of Contractor.

C. Submittal Schedule:

- (1) Contractor shall prepare its proposed submittal schedule that is coordinated with the proposed construction schedule and submit both to the District within ten (10) days after the date of the Notice to Proceed. Contractor's proposed schedules shall become the Project Construction Schedule and the Project Submittal Schedule after each is approved by the District.

Contractor to review section
01 3300 as well as this
document

- (2) Contractor is responsible for all lost time should the initial submittal be rejected, marked "revise and resubmit", etc.
- (3) All Submittals shall be forwarded to the District by the date indicated on the approved Submittal Schedule, unless an earlier date is necessary to maintain the Construction Schedule, in which case those Submittals shall be forwarded to the District so as not to delay the Construction Schedule.
- (4) Contractor may be assessed \$100 a day for each day it is late in submitting a shop drawing or sample. No extensions of time will be granted to Trade Contractor or any Subcontractor because of its failure to have shop drawings and samples submitted in accordance with the Schedule.

1.03 SHOP DRAWINGS:

- A. Contractor shall submit one reproducible transparency and six (6) opaque reproductions. The District will review and return the reproducible copy and one (1) opaque reproduction to Contractor.
- B. Before commencing installation of any Work, the Contractor shall submit and receive approval of all drawings, descriptive data, and material list(s) as required to accomplish Work.
- C. Review of Shop Drawings is regarded as a service to assist Contractor and in all cases original Contract Documents shall take precedence as outlined under General Conditions.
- D. No claim for extra time or payment shall be based on work shown on Shop Drawings unless the claim is (1) noted on Contractor's transmittal letter accompanying Shop Drawings and (2) Contractor has complied with all applicable provisions of the General Conditions, including, without limitation, provisions regarding changes and payment, and all required written approvals.
- E. District shall not review Shop Drawings for quantities of materials or number of items supplied.
- F. District's and/or Architect's review of Shop Drawing will be general. District and/or Architect review does not relieve Contractor of responsibility for dimensions, accuracy, proper fitting, construction of Work, furnishing of materials, or Work required by Contract Documents and not indicated on Shop Drawings. The District's and/or Architect's review of Shop Drawings is not to be construed as approving departures from Contract Documents.
- G. Review of Shop Drawings and Schedules does not relieve Contractor from responsibility for any aspect of those Drawings or Schedules that is a violation of local, County, State, or Federal laws, rules, ordinances, or rules and regulations of commissions, boards, or other authorities or utilities having jurisdiction.
- H. Before submitting Shop Drawings for review, Contractor shall check Shop Drawings of its subcontractors for accuracy, and confirm that all Work

Contractor to review section
01 3300 as well as this
document

contiguous with and having bearing on other work shown on Shop Drawings is accurately drawn and in conformance with Contract Documents.

- I. Submitted drawings and details must bear stamp of approval of Contractor:
 - (1) Stamp and signature shall clearly certify that Contractor has checked Shop Drawings for compliance with Drawings.
 - (2) If Contractor submits a Shop Drawing without an executed stamp of approval, or whenever it is evident (despite stamp) that Drawings have not been checked, the District and/or Architect will not consider them and will return them to the Contractor for revision and resubmission. In that event, it will be deemed that Contractor has not complied with this provision and Contractor shall bear risk of all delays to same extent as if it had not submitted any Shop Drawings or details.
- J. Submission of Shop Drawings (in either original submission or when resubmitted with correction) constitutes evidence that Contractor has checked all information thereon and that it accepts and is willing to perform Work as shown.
- K. Contractor shall pay for cost of any changes in construction due to improper checking and coordination. Contractor shall be responsible for all additional costs, including coordination. Contractor shall be responsible for costs incurred by itself, the District, the Architect, the Project Inspector, the Construction Manager, any other Subcontractor or contractor, etc., due to improperly checked and/or coordination of submittals.
- L. Shop Drawings must clearly delineate the following information:
 - (1) Project name and address.
 - (2) Specification number and description.
 - (3) Architect's name and project number.
 - (4) Shop Drawing title, number, date, and scale.
 - (5) Names of Contractor, Subcontractor(s) and fabricator.
 - (6) Working and erection dimensions.
 - (7) Arrangements and sectional views.
 - (8) Necessary details, including complete information for making connections with other Work.
 - (9) Kinds of materials and finishes.
 - (10) Descriptive names of materials and equipment, classified item numbers, and locations at which materials or equipment are to be installed in the Work. Contractor shall use same reference identification(s) as shown on Contract Drawings.

Contractor to review section
01 3300 as well as this
document

- M. Contractor shall prepare composite drawings and installation layouts when required to solve tight field conditions.
 - (1) Shop Drawings shall consist of dimensioned plans and elevations and must give complete information, particularly as to size and location of sleeves, inserts, attachments, openings, conduits, ducts, boxes, structural interferences, etc.
 - (2) Contractor shall coordinate these composite Shop Drawings and installation layouts in the field between itself and its Subcontractor(s) for proper relationship to the Work, the work of other trades, and the field conditions. The Contractor shall check and approve all submittal(s) before submitting them for final review.

1.04 PRODUCT DATA OR NON REPRODUCIBLE SUBMITTALS:

- A. Contractor shall submit manufacturer's printed literature in original form. Any fading type of reproduction will not be accepted. Contractor must submit a minimum of six (6) each, to the District. District shall return one (1) to the Contractor, who shall reproduce whatever additional copies it requires for distribution.
- B. Contractor shall submit six (6) copies of a complete list of all major items of mechanical, plumbing, and electrical equipment and materials in accordance with the approved Submittal Schedule, except as required earlier to comply with the approved Construction Schedule. Other items specified are to be submitted prior to commencing Work. Contractor shall submit items of like kind at one time in a neat and orderly manner. Partial lists will not be acceptable.
- C. Submittals shall include manufacturer's specifications, physical dimensions, and ratings of all equipment. Contractor shall furnish performance curves for all pumps and fans. Where printed literature describes items in addition to that item being submitted, submitted item shall be clearly marked on sheet and superfluous information shall be crossed out. If highlighting is used, Contractor shall mark all copies.
- D. Equipment submittals shall be complete and include space requirements, weight, electrical and mechanical requirements, performance data, and supplemental information that may be requested.
- E. Imported Materials Certification must be submitted at least ten (10) days before material is delivered.

1.05 SAMPLES:

- A. Contractor shall submit for approval Samples as required and within the time frame in the Contract Documents. Materials such as concrete, mortar, etc., which require on-site testing will be obtained from Project Site.
- B. Contractor shall submit four (4) samples except where greater or lesser number is specifically required by Contract Documents including, without limitation, the Specifications.

Contractor to review section
01 3300 as well as this
document

- (1) Samples must be of sufficient size and quality to clearly illustrate functional characteristics, with integrally related parts and attachment devices.
 - (2) Samples must show full range of texture, color, and pattern.
- C. Contractor shall make all Submittals, unless it has authorized Subcontractor(s) to submit and Contractor has notified the District in writing to this effect.
- D. Samples to be shipped prepaid or hand-delivered to the District.
- E. Contractor shall mark samples to show name of Project, name of Contractor submitting, Contract number and segment of Work where representative Sample will be used, all applicable Specifications Sections and documents, Contract Drawing Number and detail, and ASTM or FS reference, if applicable.
- F. Contractor shall not deliver any material to Site prior to receipt of District's and/or Architect's completed written review and approval. Contractor shall furnish materials equal in every respect to approved Samples and execute Work in conformance therewith.
- G. District's and/or Architect's review, acceptance, and/or approval of Sample(s) will not preclude rejections of any material upon discovery of defects in same prior to final acceptance of completed Work.
- H. After a material has been approved, no change in brand or make will be permitted.
- I. Contractor shall prepare its Submittal Schedule and submit Samples of materials requiring laboratory tests to specified laboratory for testing not less than ninety (90) days before such materials are required to be used in Work.
- J. Samples which are rejected must be resubmitted promptly after notification of rejection and be marked "Resubmitted Sample" in addition to other information required.
- K. Field Samples and Mock-Ups are to be removed by Contractor at District's direction:
 - (1) Size: As Specified.
 - (2) Furnish catalog numbers and similar data, as requested.

1.06 REVIEW AND RESUBMISSION REQUIREMENTS:

- A. The District will arrange for review of Sample(s), Shop Drawing(s), Product Data, and other submittal(s) by appropriate reviewer and return to Contractor as provided below within twenty-one (21) days after receipt or within twenty-one (21) days after receipt of all related information necessary for such review, whichever is later.
- B. One (1) copy of product or materials data will be returned to Contractor with the review status.

Contractor to review section
01 3300 as well as this
document

- C. Samples to be incorporated into the Work will be returned to Contractor, together with a written notice designating the Sample with the appropriate review status and indicating errors discovered on review, if any. Other Samples will not be returned, but the same notice will be given with respect thereto, and that notice shall be considered a return of the Sample.
- D. Contractor shall revise and resubmit any Sample(s), Shop Drawing(s), Product Data, and other submittal(s) as required by the reviewer. Such resubmittals will be reviewed and returned in the same manner as original Sample(s), Shop Drawing(s), Product Data, and other submittal(s), within fourteen (14) days after receipt thereof or within fourteen (14) days after receipt of all related information necessary for such review. Such resubmittal shall not delay the Work.
- E. Contractor may proceed with any of the Work covered by Sample(s), Shop Drawing(s), Product Data, and other submittal(s) upon its return if designated as no exception taken, or revise as noted, provided the Contractor proceeds in accordance with the District and/or the Architect's notes and comments.
- F. Contractor shall not begin any of the work covered by a Sample(s), Shop Drawing(s), Product Data, and other submittal(s), designated as revise and resubmit or rejected, until a revision or correction thereof has been reviewed and returned to Contractor.
- G. Sample(s), Shop Drawing(s), Product Data, and other submittal(s) designated as revise and resubmit or rejected and requiring resubmittal, shall be revised or corrected and resubmitted to the District no later than fourteen (14) days or a shorter period as required to comply with the approved Construction Schedule, after its return to Contractor.
- H. Neither the review nor the lack of review of any Sample(s), Shop Drawing(s), Product Data, and other submittal(s) shall waive any of the requirements of the Contract Documents, or relieve Contractor of any obligation thereunder.
- I. District's and/or Architect's review of Shop Drawings does not relieve the Contractor of responsibility for any errors that may exist. Contractor is responsible for the dimensions and design of adequate connections and details and for satisfactory construction of all the Work.

PART 2 – PRODUCTS Not Used.

PART 3 - EXECUTION Not Used.

END OF DOCUMENT

Villalovoz ES TK Portable Classroom Bldg
Tracy Unified School District

SUBMITTAL NO.:

Architect's Project # 3595001
DSA File/Apl. # 39-73/122131

DATE: _____
Re-Submittal of Original No.: _____

1. SUBMITTAL TRANSMITTAL

Attention: Affifa Kadhim



Contractor: Company _____
Contact: Name _____
Sub Contractor: _____
Contact: _____

Please submit only one trade per submittal! Description of submitted materials:

Quantity submitted	Specification Section		Description of contents (e.g. product data, shop drawings, samples)
	Section #	Section Title	

Contractor Statement: (read and acknowledge)

This submittal has been reviewed and approved with respect to the means, methods, techniques, and procedures of construction, safety precautions, and program incidentals thereto. This submittal complies with the contract documents and comprises no variations thereto, unless accompanied by a substitution request.

By: _____
Name

Date: _____

2. RE-TRANSMITTAL TO CONTRACTOR:

Distribution: Contractor, Owner, Project Inspector, RGA, Other

- | | | |
|--|--|---|
| <input type="checkbox"/> NO EXCEPTIONS TAKEN | <input type="checkbox"/> REJECTED | <input type="checkbox"/> FURNISH AS CORRECTED |
| <input type="checkbox"/> SUBMIT SPECIFIED ITEM | <input type="checkbox"/> REVISE AND RESUBMIT | <input type="checkbox"/> NO ACTION REQUIRED |

Corrections or comments made on the shop drawings during this review do not relieve the Contractor from compliance with requirements of the Drawings and Specifications. This general check is only for the review of conformance with the design concept of the project and general compliance with the information given in the Contract Documents. The Contractor is responsible for confirming and correlating all quantities and dimensions, selecting fabrication processes and techniques of construction, coordinating his work with that of all the other trades, and performing his work in a safe and satisfactory manner.

Rainforth Grau Architects

By: _____ Date: _____

Additional Comments:

See Specification Section 01 3300 for use of this form

Villalovoz ES TK Portable Classroom Bldg
Tracy Unified School District

**SUBSTITUTION
REQUEST NO.:**

Architect's Project # 3595001
DSA File/Appl. # 39-73/122131

Date: _____

1. SUBSTITUTION REQUEST

Attention: Affifa Kadhim

Contractor: Company _____

Contact: Name _____



Please submit only one product per request!

Sub Contractor: _____

Include with a specified product Submittal

Contact: _____

2. PROPOSED SUBSTITUTIONS: The undersigned requests consideration of the following substitution:

Specified Item: _____ Page No.: _____ Paragraph No.: _____

Proposed Item: _____

3. REASON FOR REQUEST:

4. REQUIREMENTS FOR SUBSTITUTIONS:

Attached data includes product description, specifications, drawings, photographs, performance and test data adequate for evaluation of request; applicable portions of data are clearly identified. Attached data also includes a description of changes to Contract Documents, which proposed substitution will require for its proper installation.

The undersigned certifies that the following paragraphs, unless modified by attachments, are correct:

1. The proposed substitution does not affect dimensions shown on drawings and does not require design changes in the Contract Documents.
2. The undersigned will pay for changes to the building design, including engineering design, detailing and construction costs caused by the requested substitution.
3. The proposed substitution will have no adverse effect on the work, the schedule or specified warranty requirements.
4. Maintenance and service parts will be readily available for the proposed substitution.

The undersigned further states that the function, appearance and quality of the proposed substitution are equivalent or superior to the specified item.

Signature - Contractor/Subcontractor

Date

5. TRANSMITTAL TO CONTRACTOR:

Distribution: Contractor, Owner, Project Inspector, RGA, Other

☐ **ACCEPTED**

☐ **ACCEPTED AS NOTED**

☐ **REJECTED**

Rainforth Grau Architects

By: _____

Date: _____

Comments:

Villalovoz ES TK Portable Classroom Bldg
Tracy Unified School District

RFI NO.:

Architect's Project # 3595001
DSA File/Apl. # 39-73/122131

Date: _____

1. REQUEST FOR INFORMATION

Attention: Affifa Kadhim

From:

Contractor:

Company

Contact:

Name

Sub Contractor:

Contact:



Identify related specific references within the Contract Documents and supporting information:

Dwg./Document No.: _____

Building/Site Location: _____

2. Existing Condition (source / reason for the request):

3. Recommended Contractor Action(s) for resolution:

4. Project Inspector Acknowledgment:

Date Reviewed: _____

5. Owner / A/E Resolution(s):

Date of Response: _____ By: _____

Attachments: _____

Extra Work Involved in the Above Described Change?

Yes ☐

No ☐

Distribution: Contractor, Owner, Project Inspector, RGA, Other
See Specification Section 01300 for use of this form

Villalovoz ES TK Portable Classroom Bldg
Tracy Unified School District

**E-DATA
REQUEST NO.:**

Architect's Project # 3595001
DSA File/Appl. # 39-73/122131

Date: _____

1. ELECTRONIC DATA REQUEST

Attention: Affifa Kadhim

From: Contractor: Company

Contact: Name

Sub Contractor:

Contact: _____



2. DATA REQUESTED - Provide list of specific drawings requested (include sheet numbers):

3. REASON FOR REQUEST - Provide clear explanation of why information is desired and for what purpose it will be utilized:

4. ACKNOWLEDGEMENT OF RESPONSIBILITY:

The electronic data files requested are distributed for reference only. Transferring such files can alter, delete or change original information. Accuracy of the data cannot be guaranteed as correct or complete and the Contractor accepts full responsibility for any and all inaccuracies, regardless of cause.

The hard copy documents, including addenda and subsequent written changes to the documents, represent the complete work of the contract and all electronic files should be cross-referenced and verified from that information as electronic files may not contain all contract information. It is the Contractor's responsibility to make any changes or revisions necessary.

This electronic data is furnished without guarantee of compatibility with your hardware or software. It is the Contractor's responsibility to notify the Architect in the event a compatibility problem or disk defect is encountered and a replacement disk is necessary.

This electronic data, in its present form, remains the property of Rainforth Grau Architects and shall not be used for any other purpose than to provide background information for the project noted above. It is not to be released to any other party without the written consent of Rainforth Grau Architects.

Accepted by: _____
Signature - Contractor/Subcontractor

Representing: _____
Contractor/Subcontractor Company Name

MEGGER GROUNDING TEST CERTIFICATE

This certifies that a Megger Grounding Test for the **Villalovoz Elementary School - TK Portable Classroom Building** for the **Tracy Unified** School District, of **San Joaquin** County, California was conducted on the _____ day of _____, **2024**, per CCR Title 24, Sections 200 H and J. The undersigned verifies that the resistance to ground was 25 ohms or less, as required, and is found to be acceptable.

Project Name: _____

DSA File No.: _____ DSA Application No.: _____

Address: _____

General Contractor's Signature: _____

Electrical Contractor's Signature: _____

Testing Agency's Signature: _____

District Inspector's Signature: _____

SEPARATE CERTIFICATE IS REQUIRED FOR EACH SITE

CERTIFICATION OF CHLORINATION AND STERILIZATION

This certifies that _____ chlorinated the domestic hot and cold water plumbing lines for the **Villalovoz Elementary School - TK Portable Classroom Building, Tracy Unified** School District. The lines were first flushed and chlorine was injected in the main water line on _____, **2024**. A minimum chlorine residual of 50 ppm was measured at each outlet. The lines were tagged, secured and the make-up water was shut off. On _____, **2024**, (a minimum of 24 hours later) the chlorine residual was retested and found to contain a minimum of 50 ppm. The plumbing lines were then thoroughly flushed with fresh water until the chlorine residual was not greater than 0.2 ppm at all outlets. A Bacteriological Examination report has been provided.

District Inspector Signature: _____

Date _____

Name of Chlorination and Testing Firm: _____

Authorized Representative Signature: _____

Date _____

Name of General Contractor: _____

Authorized Representative Signature: _____

Date _____

CERTIFICATION OF COMPLIANCE FOR BUILDING MATERIALS

This is to certify, in accordance with the Environmental Protection Agency requirements, that the materials and equipment used in the construction of the **Villalovoz Elementary School - TK Portable Classroom Building** for the **Tracy Unified** School District of **San Joaquin** County, California, are asbestos free and are, therefore, not subject to monitoring for asbestos contamination.

Project Name: _____

Address: _____

Contractor: _____

Address: _____

Signature: _____

Title: _____

Date: _____

SEPARATE CERTIFICATE IS REQUIRED FOR EACH SITE

SITE STANDARDS

PART 1 – GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including without limitation, Site Access, Conditions, and Regulations;
- B. Special Conditions;
- C. Drug-Free Workplace Certification;
- D. Tobacco-Free Environment Certification;
- E. Criminal Background Investigation/Fingerprinting Certification;
- F. Temporary Facilities and Controls.

1.02 REQUIREMENTS OF THE DISTRICT:

- A. Drug-Free Schools and Safety Requirements:
 - (1) All school sites and other District Facilities have been declared "Drug-Free Zones." No drugs, alcohol and/or smoking are allowed at any time in any buildings and/or grounds on District property. No students, staff, visitors, or contractors are to use drugs on these sites.
 - (2) Smoking and the use of tobacco products by all persons is prohibited on or in District property. District property includes school buildings, school grounds, school-owned vehicles and vehicles owned by others while on District property. Contractor shall post: "Non-Smoking Area" in a highly visible location in each work area, staging area, and parking area. Contractor may designate a smoking area outside of District property within the public right-of-way, provided that this area remains quiet and unobtrusive to adjacent neighbors. This smoking area is to be kept clean at all times.
 - (3) Contractor shall ensure that no alcohol, firearms, weapons, or controlled substances enter or are used at the Site. Contractor shall immediately remove from the Site and terminate the employment of any employee(s) found in violation of this provision.
- B. Language: Profanity or other unacceptable and/or loud language will not be tolerated, "Cat calls" or other derogatory language toward students, staff, volunteers, parents or public will not be allowed.

C. Disturbing the Peace (Noise and Lighting):

- (1) Contractor shall observe the noise ordinance of the Site at all times including, without limitation, all applicable local, city, and/or state laws, ordinances, and/or regulations regarding noise and allowable noise levels.
- (2) The use of radios, etc., shall be controlled to keep all sound at a level that cannot be heard beyond the immediate area of use. District reserves the right to prohibit the use of radios at the Site, except for mobile phones or other handheld communication radios.
- (3) If portable lights are used after dark, all light must be located so as not to direct light into neighboring property.

D. Traffic:

- (1) Driving on the Premises shall be limited to periods when students and public are not present. If driving or deliveries must be made during the school hours, two (2) or more ground guides shall lead the vehicle across the area of travel. In no case shall driving take place across playgrounds or other pedestrian paths during recess, lunch, and/or class period changes. The speed limit on-the Premises shall be five (5) miles per hour (maximum) or less if conditions require.
- (2) All paths of travel for deliveries, including without limitation, material, equipment, and supply deliveries, shall be reviewed and approved by District in advance. Any damage will be repaired to the pre-damaged condition by the Contractor.
- (3) District shall designate a construction entry to the Site. If Contractor requests, District determines it is required, and to the extent possible, District shall designate a staging area so as not to interfere with the normal functioning of school facilities. Location of gates and fencing shall be approved in advance with District and at Contractor's expense.
- (4) Parking areas shall be reviewed and approved by District in advance. No parking is to occur under the drip line of trees or in softscape areas that could otherwise be damaged.

- E. All of the above shall be observed and complied with by the Contractor and all workers on the Site. Failure to follow these directives could result in individual(s) being suspended or removed from the work force at the discretion of the District. The same rules and regulations shall apply equally to delivery personnel, inspectors, consultants, and other visitors to the Site.

PART 2 - PRODUCTS Not Used.

PART 3 - EXECUTION Not Used.

END OF DOCUMENT

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Special environmental, sustainable, and “green” building practices related to indoor air quality, resource efficiency supplementing the Pollutant Control requirements specified under Section 01 8113.10, Sustainable Design Requirements, and to ensure healthy indoor air quality in final Project.
- B. Contractor is required to comply with sustainable building practices during construction and when considering materials for substitutions. Refer to Article “Design Requirements.”

1.2 RELATED REQUIREMENTS

- A. Section 01 6116, Volatile Organic Compound (VOC) Restrictions.
- B. Section 01 50 13, Construction Waste Management and Disposal.
- C. Section 01 8113, Sustainable Design Requirements.

1.3 ADMINISTRATIVE REQUIREMENTS

- A. Submittal Procedures:
 - 1. Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
 - 2. Sustainable Design Submittals shall comply with the additional requirement of Section 01 8113, Sustainable Design Requirements.
 - 3. Closeout Submittals shall be submitted in accordance with document 01 7700, Closeout Procedures.

1.4 DESIGN REQUIREMENTS

- A. Owner has established general environmental goals for design and for construction of the Project.
 - 1. In addition to the Contractor, the Contractor’s construction team, including subcontractors, suppliers, and manufacturers, are encouraged to participate where possible to realize the Owner’s environmental goals.
 - 2. Intent is for environmental goals to be achieved in a manner which ultimately provides a safe and healthy environment for building occupants with minimal impact on the local, regional and global environment.
- B. Environmental Goals:
 - 1. Refer to specific Specifications Sections for more detailed construction requirements related to specific materials and systems.

ENVIRONMENTAL PROCEDURES
SECTION 01 3543
3595001

1.5 INFORMATIONAL SUBMITTALS

A. Indoor Air Quality (IAQ) Data:

1. Environmental Issues: Submit emission test data produced by acceptable testing laboratory, listed in this Specification Article "Quality Assurance," for materials as required in each specific Specification Section.
 - a. Laboratory reports shall contain emissions test data on Volatile Organic Compounds (VOCs) including Total Volatile Organic Compounds (TVOC), specific individual VOCs, formaldehyde and other aldehydes as described in this Section.
 - b. Identify VOCs emitted by each material as required in these Specifications, and demonstrate compliance with the California Green Building Standards Code, edition current as of the date of this Contract.
 - c. Specific test conditions and requirements are set forth in the Specifications. For required tests, submit documentation of sample acquisition, handling, and test specimen preparation, as well as test conditions, methods, and procedures. The tests consist of a 10-day conditioning period followed by a 96-hour test period.
 - 1) Samples collected during the test period at 24, 48, and 96-hours shall be analyzed for TVOC and formaldehyde.
 - 2) VOC samples collected at 96 hours shall be identified and quantified for compounds that are found on the list of Chemicals of Concern. The Chemicals of Concern list is based on the California OEHHA list as of September 2002 (The most recent list shall be used for this Specification as published at:
 - a) http://www.oehha.org/air/chronic_rels/allChrels.html.
2. Cleaning and Maintenance Products: Provide data on manufacturers' recommended maintenance, cleaning, refinishing and disposal procedures for materials and products. These procedures are for final Contractor cleaning of the project prior to Substantial Completion and for provided materials and products as required by the specific Specification Sections.
 - a. Where chemical products are recommended for these procedures, provide documentation to indicate that no component present in the cleaning product at more than 1 percent of the total mass of the cleaning product is a carcinogen or reproductive toxicant as identified in the Chemicals of Concern list referenced above.
 - b. Avoid cleaning products containing alpha-pinene, d-limonene or other unsaturated carbon double bond alkenes due to chemical reactions with ozone to form aldehydes, acidic aerosols, and ultra-fine particulate matter in indoor air.

B. Certificates:

1. Prior to Final Completion, submit a certificate signed by corporate office holder of Contractor, subcontractor, supplier, vendor, installer or manufacturer primarily responsible for the manufacturing of the product, indicating materials provided are essentially the same, and contain essentially the same components as products and materials tested.

2. Comply with requirements specified in Specification Section 01 7700, Closeout Procedures.

1.6 CLOSEOUT SUBMITTALS

- A. Submit data relating to Environmental Issues.
 1. Submit environmental product certifications, in two forms:
 - a. Two CD-ROMs organized by CSI Division Format.
 - b. Three three-ring binders organized by CSI Division Format with Table of Contents and with dividers for each Division.

1.7 QUALITY ASSURANCE

- A. Environmental Project Management and Coordination: Contractor to identify one person on Contractor's staff to be responsible for environmental issues compliance and coordination.
 1. Experience: Environmental project manager shall have experience relating to sustainable building construction.
 2. Responsibilities: Carefully review the Contract Documents for environmental issues, coordinate work of trades, subcontractors, and suppliers; instruct workers relating to environmental issues; and oversee Project Environmental Goals.
 3. Meetings: Discuss Environmental Goals at following meetings.
 - a. Pre-construction meeting.
 - b. Pre-installation meetings.
 - c. Regularly scheduled job-site meetings.
 - d. Special sustainability issues meetings.
- B. Environmental Issues Criteria: Comply with requirements listed in the Specification Sections.
- C. Acceptable Indoor Air Emissions Testing Laboratories:
 1. Selection of testing laboratories shall include assessment of prior experience in conducting indoor source emissions tests.
 2. The proposed laboratory shall be an independent company or organization not related to the manufacturer of the products to be tested.
 3. Submit documentation on proposed laboratory for review and approval by Owner.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Packaging: Deliver materials in recyclable or in reusable packaging such as cardboard, wood, paper, or reusable blankets, which will be reclaimed by supplier or manufacturer for recycling.
 1. Minimize packaging materials to maximum extent possible while still ensuring protection of materials during delivery, storage, and handling.

ENVIRONMENTAL PROCEDURES

SECTION 01 3543

3595001

2. Unacceptable Packaging Materials: Polyurethane, polyisocyanate, polystyrene, polyethylene, and similar plastic materials such as “foam” plastics and “shrink-fit” plastics.
 3. Reusable Blankets: Deliver and store materials in reusable blankets and mats reclaimed by the manufacturers or suppliers for reuse where the reclamation program exists or where a program can be developed for such reuse.
 4. Pallets: Where pallets are used, suppliers shall be responsible to ensure pallets are removed from site for reuse or for recycling.
 5. Corrugated Cardboard and Paper: Where paper products are used, recycle as part of the construction waste management recycling program, or return to the material’s manufacturer for use by the manufacturer or supplier.
 6. Sealants, Paint, Primers, Adhesives, and Coating Containers: Return to the supplier or manufacturer for reuse where such program is available.
- B. Comply with the additional requirements specified in Section 01 7419, Construction Waste Management and Disposal.

1.9 FIELD CONDITIONS

- A. No smoking will be permitted in indoor Project site locations, in accordance with California Labor Code (Section 400-6413.5).
- B. Environmental Product Certification:
1. Include certification that indicates cleaning materials comply with requirements of these Specifications.
- C. Construction Ventilation and Preconditioning:
1. Temporary Construction Ventilation: Maintain sufficient temporary ventilation of areas where materials are being used that emit VOCs. Maintain ventilation continuously during installation, and until emissions dissipate following installation. If continuous ventilation is not possible utilizing the building’s HVAC system(s) then ventilation shall be supplied using open windows and temporary fans, sufficient to provide no less than three air changes per hour.
 - a. Period after installation shall be sufficient to dissipate odors and elevated concentrations of VOCs. Where no specific period is stated in these Specifications, a time period of 72 hours shall be used.
 - b. Ventilate areas directly to outside; ventilation to other enclosed areas is not acceptable.
 2. During dust producing activities, including drywall installation and finishing, turn ventilation system off, and openings in supply and return HVAC system shall be protected from dust infiltration. Provide temporary ventilation as required.
 3. Preconditioning: Prior to installation, allow products which have odors and significant VOC emissions to off-gas in dry, well-ventilated space for 14 calendar days to allow for reasonable dissipation of odors and emissions prior to delivery to Project site and installation.
 - a. Condition products without containers and packaging to maximize off-gassing of VOCs

- b. Condition products in ventilated warehouse or other building. Comply with substitution requirements for consideration of other locations.
- D. Protection:
 - 1. Moisture Stains: Materials with evidence of moisture damage, including stains, are not acceptable, including both stored and installed materials; immediately remove from site and properly dispose.
 - a. Take special care to prevent an accumulation of moisture on installed materials and within packaging during delivery, storage, and handling to prevent development of molds and mildew on packaging and on products
 - b. Immediately remove from site and properly dispose of materials showing signs of mold and signs of mildew, including materials with moisture stains.
 - c. Replace moldy materials with new, undamaged materials.
 - 2. Ducts: Seal ducts during transportation, delivery, and construction to prevent accumulation of construction dust and construction debris inside of ducts.

PART 2 - PRODUCTS

2.1 SUBSTITUTIONS

- A. Requests for substitutions shall comply with requirements specified in Specification Section 01 3300, Submittals, and with the following additional information required where environmental issues are specified:
 - 1. Indicate how each proposed substitution complies with requirements for VOCs.
 - 2. Owner, in consultation with Architect reserve the right to reject proposed substitutions where data for VOCs is not provided or where emissions of individual VOCs are higher than for the specified materials.
 - 3. Comply with the specified recycled content and other environmental requirements.

PART 3 - EXECUTION

3.1 FIELD QUALITY CONTROL

- A. Sequencing:
 - 1. On-Site Application: Where odorous and/or high VOC emitting products are applied on-site, apply prior to installation of porous and fibrous materials. Where this is not possible, protect porous materials with polyethylene vapor retarders.
 - 2. Complete interior finish material installation no less than 14 days prior to Substantial Completion to allow for Building Flush Out as described in Paragraph 3.1B.
- B. Building Flush Out: Just prior to Substantial Completion, flush out building air continuously using maximum tempered outside air, or maximum amount of outside air while achieving reasonable indoor temperature, for at least 14 calendar days. Continuously is defined as 24 hours per day, 7 days a week. If interruptions of more

ENVIRONMENTAL PROCEDURES
SECTION 01 3543
3595001

than a few hours are required for testing and balancing purposes, extend flush out period accordingly in order to achieve the minimum 14 calendar day building flush out period.

1. When Contractor is required to perform touch-up work, provide temporary construction ventilation during installation and extend building flush-out by a minimum of 4 calendar days after touch-up installation is complete with maximum tempered outside air for 24 hours per day.
2. If construction schedule permits, extend flush-out period beyond minimum building flush out period for an additional 15 days.
3. Return ventilation system to normal operation following flush-out period to minimize energy consumption.

3.2 CLEANING

- A. Clean interior and exterior surfaces exposed to view; remove temporary labels, stains, and foreign substances; polish transparent and glossy surfaces using cleaning and maintenance products that conform to standards as described in Part 1 of this Section.
- B. Clean equipment and fixtures to sanitary condition using cleaning and maintenance products that conform to standards as described in Part 1 of this Section.
- C. Products used for cleaning shall comply with Proposition 65 and the additional restrictions for volatile organic compounds specified in Section 01 6116.
- D. Vacuum carpeted and soft surfaces with high efficiency particulate arrestor (HEPA) vacuum.
- E. If ducts were not sealed during construction, and contain dust or dirt, clean ducts using HEPA vacuum immediately prior to Substantial Completion and prior to using ducts to circulate air. Oil film on sheet metal shall be removed before shipment to site. Ducts shall be inspected to confirm that no oil film is present. Remove oil film.
- F. Replace air filters, both pre and final filters, just prior to Substantial Completion.
- G. Remove and properly dispose of recyclable materials using construction waste management program described in Section 01 7419, Construction Waste Management and Disposal.

3.3 PROTECTION

- A. Protect interior materials from water intrusion or penetration where interior products are not intended for wet applications and are exposed to moisture.
- B. Protect installed products using methods that do not support growth of mold and mildew.
 1. Immediately remove from site materials with mold or mildew.

END OF SECTION

REGULATORY REQUIREMENTS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Obtaining of Permits, Licenses and Registrations and Work to Comply with All Applicable Laws and Regulations;
- B. Special Conditions; and
- C. Quality Control.

1.02 DESCRIPTION:

This section covers the general requirements for regulatory requirements pertaining to the Work and is supplementary to all other regulatory requirements mentioned or referenced elsewhere in the Contract Documents.

1.03 REQUIREMENTS OF REGULATORY AGENCIES:

- A. All statutes, ordinances, laws, rules, codes, regulations, standards, and the lawful orders of all public authorities having jurisdiction over the Work, are hereby incorporated into these Contract Documents as if repeated in full herein and are intended to be included in any reference to Code or Building Code, unless otherwise specified, including, without limitation, the references in the list below. Contractor shall make available at the Site copies of all the listed documents applicable to the Work as the District and/or Architect may request, including, without limitation, applicable portions of the California Code of Regulations ("CCR").
 - (1) California Building Standards Administrative Code, Part 1, Title 24, CCR.
 - (2) California Building Code (CBC), Part 2, Title 24, CCR; (International Building Code volumes 1-2 and California Amendments).
 - (3) California Electrical Code (CEC), Part 3, Title 24, CCR; (National Electrical Code and California Amendments).
 - (4) California Mechanical Code (CMC), Part 4, Title 24, CCR; (Uniform Mechanical Code and California Amendments).
 - (5) California Plumbing Code (CPC), Part 5, Title 24, CCR; (Uniform Plumbing Code and California Amendments).

- (6) California Fire Code (CFC), Part 9, Title 24, CCR; (International Fire Code and California Amendments).
- (7) California Green Building Standards Code (CALGreen), Part 11, Title 24, CCR.
- (8) California Referenced Standards Code, Part 12, Title 24, CCR.
- (9) State Fire Marshal Regulations, Public Safety, Title 19, CCR.
- (10) Partial List of Applicable National Fire Protection Association (NFPA) Standards:
 - (a) NFPA 13 - Automatic Sprinkler System.
 - (b) NFPA 14 - Standpipes Systems.
 - (c) NFPA 17A - Wet Chemical System
 - (d) NFPA 24 - Private Fire Mains.
 - (e) (California Amended) NFPA 72 - National Fire Alarm Codes.
 - (f) NFPA 253 - Critical Radiant Flux of Floor Covering System.
 - (g) NFPA 2001 - Clean Agent Fire Extinguishing Systems.
- (11) California Division of the State Architect interpretation of Regulations ("DSA IR"), including, without limitation:
 - (a) DSA IR A-6 — Construction Change Document Submittal and Approval Processes.
 - (b) DSA IR A-7 — Project Inspector Certification and Approval.
 - (c) DSA IR A-8 — Project Inspector and Assistant Inspector Duties and Performance.
 - (d) DSA IR A-12 — Assistant Inspector Approval.
- (12) DSA Procedures ("DSA PR")
 - (a) DSA PR 13-01 – Construction Oversight Process
 - (b) DSA PR 13-02 – Project Certification Process

B. This Project shall be governed by applicable regulations, including, without limitation, the State of California's Administrative Regulations for the Division of the State Architect-Structural Safety (DSA/SS), Chapter 4, Part 1, Title 24, CCR, and the most current version on the date the bids are opened and as it pertains to school construction including, without limitation:

- (1) Test and testing laboratory per Section 4-335. District shall pay for the testing laboratory.
- (2) Special inspections per Section 4-333(c).
- (3) Deferred Approvals per section 4-317(g).
- (4) Verified reports per Sections 4-336 & 4-343(c).
- (5) Duties of the Architect & Engineers shall be per Sections 4-333(a) and 4-341.
- (6) Duties of the Contractor shall be per Section 4-343.
- (7) Duties of Project Inspector shall be per Section 4-334.
- (8) Addenda and Construction Change Documents per Section 4-338.

Contractor shall keep and make available all applicable parts of the most current version of Title 24 referred to in the plans and specifications at the Site during construction.

C. Items of deferred approval shall be clearly marked on the first sheet of the Architect's and/or Engineer's approved Drawings. All items later submitted for approval shall be per Title 24 requirements to the DSA.

- (1) Contractor shall submit the following to Architect for review and endorsement:
 - (a) Product information on proposed material/system supplier.
 - (b) Drawings, specifications, and calculations prepared, signed, and stamped by an architect or engineer licensed in the State of California for that portion of the Work.
 - (c) All other requirements as may be required by DSA.
- (2) Cost of preparing and submitting documentation per DSA Deferred Approval requirements including required modifications to Drawings and Specifications, whether or not indicated in the Contract Documents, shall be borne by Contractor.
- (3) Contractor shall not begin fabrication and installation of deferred approval items without first obtaining DSA approval of Drawings and Specifications.
- (4) Schedule of Work Subject to DSA Deferred Approval: Window wall systems exceeding 10 feet in span.

PART 2 – PRODUCTS Not Used.

PART 3 – EXECUTION Not Used.

END OF DOCUMENT

ABBREVIATIONS AND ACRONYMS

PART 1 – GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions including without limitation, Definitions;
- B. Special Conditions.

1.02 DOCUMENT INCLUDES:

- A. Abbreviations used throughout the Contract Documents.
- B. Reference to a technical society, organization, or body is by abbreviation, as follows:

1.	AA	The Aluminum Association
2.	AASHTO	American Association of State Highway and Transportation Officials
3.	ABPA	Acoustical and Board Products Association
4.	ACI	American Concrete Institute
5.	AGA	American Gas Association
6.	AGC	Associated General Contractors of America
7.	AHC	Architectural Hardware Consultant
8.	AHRI	Air Conditioning, Heating, Refrigeration Institute
9.	AI	Asphalt Institute
10.	AIA	American Institute of Architects
11.	AISC	American Institute of Steel Construction
12.	AISI	American Iron and Steel Institute
13.	AMCA	Air Movement and Control Association
14.	ANSI	American National Standards Institute
15.	APA	APA – The Engineered Wood Association
16.	ASCE	American Society of Civil Engineers
17.	ASHRAE	American Society of Heating, Refrigeration and Air Conditioning Engineers
18.	ASME	American Society of Mechanical Engineers
19.	ASTM	American Society of Testing and Materials International
20.	AWPA	American Wood Protection Association
21.	AWPI	American Wood Preservers Institute
22.	AWS	American Welding Society
23.	AWSC	American Welding Society Code
24.	AWI	Architectural Woodwork Institute
25.	AWWA	American Water Works Association
26.	BIA	The Brick Industry Association

27.	CCR	California Code of Regulations
28.	CLFMI	Chain Link Fence Manufacturers Institute
29.	CRA	California Redwood Association
30.	CRSI	Concrete Reinforcing Steel Institute
31.	CS	Commercial Standards
32.	CSI	Construction Specifications Institute
33.	CTI	Cooling Technology Institute
34.	FGIA	Fenestration and Glazing Industry Alliance
35.	FGMA	Flat Glass Manufacturers' Association
36.	FIA	Factory Insurance Association
37.	FM	Factory Mutual Global
38.	FS/FED SPEC	Federal Specification
39.	FTI	Facing Title Institute
40.	GA	Gypsum Association
41.	IAPMO	International Association of Plumbing and Mechanical Officials
42.	ICC	International Code Council
43.	IEEE	Institute of Electrical and Electronics Engineers
44.	IES	Illuminating Engineering Society
45.	MCAC	Mason Contractors Association of California
46.	MIMA	Mineral Wool Insulation Manufacturers Association
47.	MLMA	Metal Lath Manufacturers Association
48.	MS/MIL SPEC	Military Specifications
49.	NAAMM	National Association of Architectural Metal Manufacturers
50.	NBHA	National Builders Hardware Association
51.	NCMA	National Concrete Masonry Association
52.	NCSEA	National Council of Structural Engineers Associations
53.	NEC	National Electrical Code
54.	NEMA	National Electrical Manufacturers Association
55.	NIST	National Institute of Standards and Technology
56.	NSI	Natural Stone Institute
57.	NTMA	National Terrazzo and Mosaic Association, Inc.
58.	ORS	Office of Regulatory Services (California)
59.	OSHA	Occupational Safety and Health Act
60.	PCI	Precast/Prestressed Concrete Institute
61.	PCA	Portland Cement Association
62.	PCA	Painting Contractors Association
63.	PDI	Plumbing Drainage Institute
64.	PEI	Porcelain Enamel Institute, Inc.
65.	PG&E	Pacific Gas & Electric Company
66.	PS	Product Standards
67.	SDI	Steel Door Institute; Steel Deck Institute
68.	SJI	Steel Joist Institute
69.	SSPC	Society for Protective Coatings
70.	TCNA	Tile Council of North America, Inc.
71.	TPI	Truss Plate Institute
72.	UBC	Uniform Building Code
73.	UL	Underwriters Laboratories Code

74.	UMC	Uniform Mechanical Code
75.	USDA	United States Department of Agriculture
76.	VI	Vermiculite Institute
77.	WCLIB	West Coast Lumber Inspection Bureau
78.	WDMA	Window and Door Manufacturers Association
79.	WEUSER	Western Electric Utilities Service Engineering Requirements
80.	WIC	Woodwork Institute of California

PART 2 - PRODUCTS Not Used.

PART 3 - EXECUTION Not Used.

END OF DOCUMENT

DEFINITIONS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions including without limitation, Definitions;
- B. Special Conditions.

1.02 QUALITY ASSURANCE

- A. For products or workmanship specified by association, trade, or Federal Standards, Contractor shall comply with requirements of the standard, except when more rigid requirements are specified in the Contract Documents, or are required by applicable codes.
- B. Contractor shall conform to current reference standard publication date in effect on the date of bid opening.
- C. Contractor shall obtain copies of standards unless specifically required not to by the Contract Documents.
- D. Contractor shall maintain a copy of all standards at jobsite during submittals, planning, and progress of the specific Work, until final completion, unless specifically required not to by the Contract Documents.
- E. Should specified reference standards conflict with Contract Documents, Contractor shall request clarification from the District and/or the Architect before proceeding.
- F. The contractual relationship of the parties to the Contract shall not be altered from the contractual relationship as indicated in the Contract Documents by mention or inference otherwise in any referenced document.
- G. Governing Codes shall be as shown in the Contract Documents including, without limitation, the Specifications.

END OF DOCUMENT

REFERENCES**PART 1 - GENERAL****1.01 SCHEDULE OF REFERENCES:**

The following information is intended only for the general assistance of the Contractor, and the District does not represent that all of the information is current. It is the Contractor's responsibility to verify the correct information for each of the entities listed.

AA	The Aluminum Association 1400 Crystal Drive, Suite 430 Arlington, VA 22202 www.aluminum.org	703/358-2960
AABC	Associated Air Balance Council 2401 Pennsylvania Avenue NW, Suite 330 Washington, DC 20037 www.aabc.com	202/737-0202
AASHTO	American Association of State Highway and Transportation Officials 555 12th St. NW - Suite 1000 Washington, DC 20004 www.transportation.org	202/624-5800
AATCC	American Association of Textile Chemists and Colorists P.O. Box 12215 Research Triangle Park, NC 27709-2215 www.aatcc.org	919/549-8141
ACA	American Coatings Association 901 New York Ave., NW, Suite 300 West Washington, DC 20001 www.paint.org	202/462-6272
ACI	American Concrete Institute 38800 Country Club Dr. Farmington Hills, MI 48331-3439 www.concrete.org	248/848-3800
ACPA	American Concrete Pipe Association 5605 N. MacArthur Blvd., Suite 340 Irving, TX 75038 www.concrete-pipe.org	972/506-7216

ADC	Air Duct Council 1901 N. Roselle Road, Suite 800 Schaumburg, IL 60195 www.flexibleduct.org	847/706-6750
AF&PA	American Forest and Paper Association 1101 K Street, NW, Suite 700 Washington, DC 20005 www.afandpa.org	202/463-2700
AGA	American Gas Association 400 North Capitol Street, NW, Suite 450 Washington, DC 20001 www.aga.org	202/824-7000
AGC	Associate General Contractors of America 2300 Wilson Blvd., Suite 300 Arlington, VA 22201 www.agc.org	703/548-3118
AHA	American Hardboard Association 1210 West Northwest Highway Palatine, IL 60067 http://domensino.com/AHA/default.htm	847/934-8800
AI	Asphalt Institute 2696 Research Park Drive Lexington, KY 40511-8480 www.asphaltinstitute.org	859/288-4960
AIA	The American Institute of Architects 1735 New York Ave., NW Washington, DC 20006-5292 www.aia.org	202/626-7300
AISC	American Institute of Steel Construction 130 East Randolph Street, Suite 2000 Chicago, IL 60601 www.aisc.org	312.670.2400
AISI	American Iron and Steel Institute 25 Massachusetts Ave., NW, Suite 800 Washington, DC 20001 www.steel.org	202/452-7100
AITC	American Institute of Timber Construction 1010 South 336th Street, #210 Federal Way, WA 98003-7394 https://www.plib.org/aitc/	253/835-3344

ALI	Associated Laboratories, Inc. P.O. Box 152837 Dallas, TX 75315 www.assoc-labs.com	214/565-0593
ALSC	American Lumber Standards Committee, Inc. 7470 New Technology Way, Suite F Frederick, MD 21703 www.alsc.org	301/972-1700
AMCA	Air Movement and Control Association International, Inc. 30 W. University Drive Arlington Heights, IL 60004 www.amca.org	847/394-0150
AMPP (formerly SSPC)	Association for Materials Protection and Performance (merger of Society for Protective Coatings and National Association of Corrosion Engineers International) (formerly Steel Structures Painting Council) 800 Trumbull Drive Pittsburgh, PA 15205 www.sspc.org	412/281-2331 877/281-7772
ANLA	AmericanHort (merger of American Nursery & Landscape Association and OFA – The Association of Horticultural Professionals) 2130 Stella Court Columbus, OH 43215 www.americanhort.org	614/487-1117
ANSI	American National Standards Institute 1899 L Street, NW, 11th Floor Washington, DC 20036 www.ansi.org	202/293-8020
APA	APA-The Engineered Wood Association 7011 S. 19th Street Tacoma, WA 98466-5333 www.apawood.org	253/565-6600

APA	Architectural Precast Association 325 John Knox Rd, Suite L-103 Tallahassee, FL 32303 www.archprecast.org	850/205-5637
APCIA	American Property Casualty Insurance Association (merger of American Insurance Association (formerly the National Board of Fire Underwriters) with the Property Casualty Insurers Association of America) 555 12th St, NW, Suite 550 Washington DC 20004 www.apci.org	202/828-7100
AHRI	Air Conditioning and Refrigeration Institute (now Air-Conditioning, Heating, & Refrigeration Institute) 2311 Wilson Blvd, Suite 400 Arlington, VA 22201 www.ahrinet.org	703/524-8800
ARMA	Asphalt Roofing Manufacturers Association 2331 Rock Spring Road Forest Hill, MD 21050 www.asphaltroofing.org	443/640-1075
ASA	The Acoustical Society of America Suite 300 1305 Walt Whitman Road Melville, NY 11747-4300 https://acousticalsociety.org/	516/576-2360
ASCE	American Society of Civil Engineers 1801 Alexander Bell Drive Reston, VA 20191 www.asce.org	800/548-2723 703/295-6300
ASHRAE	American Society of Heating, Refrigerating and Air Conditioning Engineers 180 Technology Parkway Peachtree Corners, GA 30092 www.ashrae.org	800/527-4723 404/636-8400
ASLA	American Society of Landscape Architects 636 Eye Street, NW Washington, DC 20001-3736 www.asla.org	202/898-2444
ASME	American Society of Mechanical Engineers Two Park Avenue New York, NY 10016-5990 www.asme.org	800/834-2763

ASPE	American Society of Plumbing Engineers 6400 Shafer Court, Suite 350 Rosemont, IL 60018 http://aspe.org	847/296-0002
ASQ	American Society for Quality P.O. Box 3005 Milwaukee, WI 53201-3005 or 600 North Plankinton Avenue Milwaukee, WI 53203 http://asq.org	800/248-1946 414/272-8575
ASSE	American Society of Sanitary Engineering 18927 Hickory Creek Dr., Suite 220 Mokena, IL 60448 www.asse-plumbing.org	708/995-3019
ASTM	ASTM International 100 Barr Harbor Drive PO Box C700 West Conshohocken, PA, 19428-2959 www.astm.org	610/832-9500
AWCI	Association of the Wall and Ceiling Industry 513 West Broad Street, Suite 210 Falls Church, VA 22046 www.awci.org	703/538-1600
AWPA	American Wood Protection Association (formerly American Wood Preservers Institute) P.O. Box 361784 Birmingham, AL 35236-1784 www.awpa.com	205/733-4077
AWS	American Welding Society 8669 NW 36 Street, Suite 130 Miami, FL 33166 www.aws.org	800/443-9353 305/443-9353
AWI	Architectural Woodwork Institute 46179 Westlake Drive, Suite 120 Potomac Falls, VA 20165-5874 www.awinet.org	571/323-3636
AWWA	American Water Works Association 6666 West Quincy Avenue Denver, CO 80235 www.awwa.org	800/926-7337 303/794-7711

BHMA	Builders Hardware Manufacturers Association 355 Lexington Avenue, 15th Floor New York, NY 10017 www.buildershardware.com	212/297-2122
BIA	The Brick Industry Association 12007 Sunrise Valley Drive, Suite 430 Reston, VA 20191 www.gobrick.com	703/620-0010
CGA	Compressed Gas Association 8484 Westpark Drive, Suite 220 McLean, VA 22102 www.cganet.com	703/788-2700
CISCA	Ceilings & Interior Systems Construction Association 1010 Jorie Blvd, Suite 30 Oak Brook, IL 60523 www.cisca.org	630/584-1919
CISPI	Cast Iron Soil Pipe Institute 2401 Fieldcrest Dr. Mundelein, IL 60060 www.cispi.org	224/864-2910
CLFMI	Chain Link Fence Manufacturers Institute 10015 Old Columbia Road, Suite B-215 Columbia, MD 21046 chainlinkinfo.org	301/596-2583
CPA	Composite Panel Association 19465 Deerfield Avenue, Suite 306 Leesburg, VA 20176 www.compositepanel.org	703/724-1128
CPSC	Consumer Product Safety Commission 4330 East-West Highway Bethesda, MD 20814 www.cpsc.gov	800/638-2772
CRA	California Redwood Association 818 Grayson Road, Suite 201 Pleasant Hill, CA 94523 www.calredwood.org	925/935-1499

CRI	Carpet and Rug Institute 100 S. Hamilton Street Dalton, GA 30722-2048 www.carpet-rug.org	706/278-3176
CRSI	Concrete Reinforcing Steel Institute 933 N. Plum Grove Road Schaumburg, IL 60173-4758 www.crsi.org	847/517-1200
CSI	The Construction Specifications Institute 123 North Pitt St, Suite 450 Alexandria, VA 22314 www.csinet.org	800/689-2900
CTIOA	Ceramic Tile Institute of America 12061 Jefferson Blvd. Culver City, CA 90230-6219 www.ctioa.org	310/574-7800
DHA	Decorative Hardwoods Association (formerly Hardwood Plywood & Veneer Association) 42777 Trade West Dr. Sterling, VA 20166 https://www.decorativehardwoods.org/	703/435-2900
DHI	Door and Hardware Institute (formerly National Builders Hardware Association) 2001 K Street NW, 3rd Floor North Washington, DC 20006 www.dhi.org	202/367-1134
DIPRA	Ductile Iron Pipe Research Association P.O. Box 190306 Birmingham, AL 35219 www.dipra.org	205/402-8700
DOC	U.S. Department of Commerce 1401 Constitution Ave., NW Washington, DC 20230 www.commerce.gov	202/482-2000
DOT	U.S. Department of Transportation 1200 New Jersey Avenue, SE Washington, DC 20590 www.dot.gov	855/368-4200
EJMA	Expansion Joint Manufacturers Association, Inc. 25 North Broadway Tarrytown, NY 10591 www.ejma.org	914/332-0040

EPA	Environmental Protection Agency Ariel Rios Building 1200 Pennsylvania Avenue, N.W. Washington, DC 20460 www.epa.gov	202/272-0167
FCICA	Floor Covering Installation Contractors Association 800 Roosevelt Rd., Bldg. C, Suite 312 Glen Ellyn, IL 60137 www.fcica.com	630/672-3702
FGIA	Fenestration and Glazing Industry Alliance 1900 E Golf Rd, Suite 1250 Schaumburg, IL 60173 https://fgiaonline.org/	847/303-5664
FM Global	Factory Mutual Insurance Company Amy Daley Global Practice Leader – Education, Public Entities, Health Care FM Global 270 Central Avenue Johnston, RI 02919-4949 www.fmglobal.com	401/275-3000 401/275-3029
FS	General Services Administration (GSA) Index of Federal Specifications, Standards and Commercial Item Descriptions 470 East L'Enfant Plaza, SW, Suite 8100 Washington, DC 20407 www.gsa.gov	202/619-8925
GA	The Gypsum Association 962 Wayne Ave., Suite 620 Silver Spring, MD 20910 www.gypsum.org	301/277-8686
HMA	Hardwood Manufacturers Association One Williamsburg Place, Suite 108 Warrendale, PA 15086 http://hmamembers.org	412/244-0440

IAPMO	International Association of Plumbing and Mechanical Officials (formerly the Western Plumbing Officials Association) 4755 E. Philadelphia St. Ontario, CA 91761 www.iapmo.org	909/472-4100
ICC	International Code Council 500 New Jersey Avenue, NW, 6th Floor Washington, DC 20001 www.iccsafe.org	888/422-7233
IEEE	Institute of Electrical and Electronics Engineers 3 Park Avenue, 17th Floor New York, NY 10016-5997 www.ieee.org	212/419-7900
IES	Illuminating Engineering Society 120 Wall Street, Floor 17 New York, NY 10005-4001 www.ies.org	212/248-5000
ITRK	Intertek Testing Services 3933 US Route 11 Cortland, NY 13045 www.intertek.com	607/753-6711
MCAA	Mechanical Contractors Association of America 1385 Piccard Drive Rockville, MD 20850 www.mcaa.org	301/869-5800
MMPA (formerly WMMPA)	Moulding & Millwork Producers Association (formerly Wood Moulding & Millwork Producers Association) 507 First Street Woodland, CA 95695 www.wmmpa.com	530/661-9591 800/550-7889
MSS	Manufacturers Standardization Society (MSS) of the Valve and Fittings Industry, Inc. 127 Park Street, NE Vienna, VA 22180-4602 http://mss-hq.org	703/281-6613
NAAMM	National Association of Architectural Metal Manufacturers 800 Roosevelt Rd. Bldg. C, Suite 312 Glen Ellyn, IL 60137 www.naamm.org	630/942-6591

NAIMA	North American Insulation Manufacturers Association P.O. Box 1906 Alexandria, VA 22313 https://insulationinstitute.org/	703/684-0084
NALP	National Association of Landscape Professionals (formerly Professional Landcare Network) 12500 Fair Lakes Circle, Suite 200 Fairfax, VA 22033 https://www.landscapeprofessionals.org/	703/736-9666
NAPA	National Asphalt Pavement Association 6406 Ivy Lane, Suite 350 Greenbelt, MD 20770-1441 www.asphaltpavement.org	888/468-6499 301/731-4748
NCSPA	National Corrugated Steel Pipe Association 14070 Proton Road, Suite 100 Dallas, TX 75244 www.ncspa.org	972/850-1907
NCMA	National Concrete Masonry Association 13750 Sunrise Valley Drive Herndon, VA 20171-4662 www.ncma.org	703/713-1900
NEBB	National Environmental Balancing Bureau 8575 Grovemont Circle Gaithersburg, MD 20877 www.nebb.org	301/977-3698
NECA	National Electrical Contractors Association 1201 Pennsylvania Ave. NW Washington, D.C., 20004 www.necanet.org	202/991-6300
NEMA	National Electrical Manufacturers Association 1300 North 17th Street N, Suite 900 Rosslyn, VA 22209 www.nema.org	703/841-3200
NEII	National Elevator Industry, Inc. 5537 SW Urish Road Topeka, KS 66610 https://nationalelevatorindustry.org/	703/589-9985
NFPA	National Fire Protection Association 1 Batterymarch Park Quincy, MA 02169-7471 www.nfpa.org	800/344-3555 855/274-8525

NGA (formerly GANA)	National Glass Association (merged with Glass Association of North America) 1945 Old Gallows Road Suite 750 Vienna, VA 22182 www.glass.org	866/342-5642 Ext 127
NHLA	National Hardwood Lumber Association PO Box 34518 Memphis, TN 38184 www.nhla.com	901/377-1818
NIA	National Insulation Association 516 Herndon Pkwy., Ste. D Herndon, VA 20170 www.insulation.org	703/464-6422
NRCA	National Roofing Contractors Association 10255 W. Higgins Road, Suite 600 Rosemont, IL 60018-5607 www.nrca.net	847/299-9070
NSF	NSF International 789 N. Dixboro Road Ann Arbor, MI 48113-0140 www.nsf.org	800/673-6275 734/769-8010
NSI	Natural Stone Institute (formerly Marble Institute of America) 380 E. Lorain St. Oberlin, OH 44074 https://www.naturalstoneinstitute.org/	440/250-9222
NTMA	National Terrazzo and Mosaic Association 209 N. Crockett Street, Suite 2 PO Box 2605 Fredericksburg, TX 78624 www.ntma.com	800/323-9736
OSHA	Occupational Safety and Health Act U.S. Department of Labor Occupational Safety & Health Administration 200 Constitution Ave., NW Washington, DC 20210 www.osha.gov	800/321-OSHA (6742)

PCA	Portland Cement Association 5420 Old Orchard Road Skokie, IL 60077 or 200 Massachusetts Ave NW, Suite 200 Washington, DC 20001 www.cement.org	847/966-6200 202/408-9494
PCA	Painting Contractors Association (formerly Painting and Decorating Contractors of America) 2316 Millpark Drive Maryland Heights, MO 63043 https://www.pcapainted.org/	800/322-7322
PCI	Precast/Prestressed Concrete Institute 8770 W. Bryn Mawr Ave., Suite 1150 Chicago, IL 60631 www.pci.org	312/786-0300
PDI	Plumbing & Drainage Institute 800 Turnpike Street, Suite 300 North Andover, MA 01845 http://pdionline.org	978/557-0720 800/589-8956
PEI	Porcelain Enamel Institute, Inc. P.O. Box 920220 Norcross, GA 30010 www.porcelainenamel.com	770/676-9366
PG&E	Pacific Gas & Electric Company P.O. Box 997300 Sacramento, CA 95899-7300 www.pge.com	800/743-5000
PLIB	Pacific Lumber Inspection Bureau (formerly West Coast Lumber Inspection Bureau) 1010 South 336th Street, Suite 210 Federal Way, WA 98003-7394 https://www.plib.org/	253/835-3344
RFCI	Resilient Floor Covering Institute 115 Broad Street, Suite 201 La Grange, GA 30240 www.rfci.com	706/882-3833
SDI	Steel Deck Institute P.O. Box 426 Glenshaw, PA 15116 www.sdi.org	412/487-3325

SDI	Steel Door Institute 30200 Detroit Road Westlake, OH 44145 www.steeldoor.org	440/899-0010
SJI	Steel Joist Institute 140 West Evans Street, Suite 203 Florence, SC 29501 http://steeljoist.org	843/407-4091
SMA	Stucco Manufacturers Association 5753 E Santa Ana Cyn Rd, #G-156 Anaheim, CA 92807 www.stuccomfgassoc.com	714/473-9579
SMACNA	Sheet Metal and Air Conditioning Contractors' National Association 4201 Lafayette Center Drive Chantilly, VA 20151-1219 www.smacna.org	703/803-2980
SPI	SPI: The Plastics Industry Trade Association, Inc. 1425 K St. NW, Suite 500 Washington, DC 20005 www.plasticsindustry.org	202/974-5200
TCA	The Tile Council of North America 100 Clemson Research Blvd. Anderson, SC 29625 www.tcnatile.com	864/646-8453
TPI	Truss Plate Institute 2670 Crain Highway, Suite 203 Waldorf, MD 20601 www.tpinst.org	240/587-5582
TPI	Turfgrass Producers International 444 E. Roosevelt Road #346 Lombard, IL 60148 www.turfgrasssod.org	800/405-8873 847/649-5555
TCIA	Tree Care Industry Association (formerly the National Arborist Association) 670 N Commercial Street, Suite 201 Manchester, NH 03101 www.tcia.org	603/314-5380 800/733-2622

TVI	The Vermiculite Institute c/o The Schundler Company 10 Central Street Nahant, MA 01908 www.vermiculiteinstitute.org	732/287-2244
UL	Underwriters Laboratories Inc. 333 Pfingsten Road Northbrook, IL 60062-2096 www.ul.com	847/272-8800 877/854-3577
UNI	Uni-Bell PVC Pipe Association 201 E. John Carpenter Freeway, Suite 750 Irving, TX 75062 www.uni-bell.org	972/243-3902
USDA	U.S. Department of Agriculture 1400 Independence Ave., S.W. Washington, DC 20250 www.usda.gov	202/720-2791
WA	Wallcoverings Association 35 E Wacker Dr., Suite 850 Chicago, IL 60601 www.wallcoverings.org	312/224-2574
WCMA	Window Covering Manufacturers Association 355 Lexington Avenue 15th Floor New York, NY 10017 www.wcmanet.org	212/297-2122
WDMA	Window & Door Manufacturers Association 2001 K Street NW, 3rd Floor North Washington, D.C. 20006 www.wdma.com	202/367-1157
WI	Woodwork Institute 1455 Response Road, Suite 110 Sacramento, CA 95815 www.wicnet.org	916/372-9943
WRI	Wire Reinforcement Institute 942 Main Street, Suite 300 Hartford, CT 06103 www.wirereinforcementinstitute.org	860/240-9545
WWCA	Western Wall & Ceiling Contractors Association 1910 N. Lime St. Orange, CA 92865 www.wwcca.org	714/221-5520

WWPA	Western Wood Products Association (formerly Redwood Inspection Service) 1500 SW First Ave., Suite 870 Portland, OR 97201 www.wwpa.org	503/224-3930
------	--	--------------

PART 2 - PRODUCTS Not Used.

PART 3 - EXECUTION Not Used.

END OF DOCUMENT

MATERIALS AND EQUIPMENT

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Purchase of Materials and Equipment;
- B. Special Conditions;
- C. Imported Materials Certification.

1.02 MATERIAL AND EQUIPMENT

- A. Only items approved by the District and/or Design Professional shall be used.
- B. Contractor shall submit lists of products and other product information in accordance with the Contract Documents, including, without limitation, the provisions regarding the submittals.

1.03 MATERIAL AND EQUIPMENT COLORS

- A. The District and/or Architect will provide a schedule of colors.
- B. No individual color selections will be made until after approval of all pertinent materials and equipment and after receipt of appropriate samples in accordance with the Contract Documents, including, without limitation, the provisions regarding the submittals.
- C. Contractor shall request priority in writing for any item requiring advance ordering to maintain the approved Construction Schedule.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. Contractor shall deliver manufactured materials in original packages, containers, or bundles (with seals unbroken), bearing name or identification mark of manufacturer.
- B. Contractor shall deliver fabrications in as large assemblies as practicable; where specified as shop-primed or shop-finished, package or crate as required to preserve such priming or finish intact and free from abrasion.
- C. Contractor shall store materials in such a manner as necessary to properly protect them from damage. Materials or equipment damaged by handling, weather, dirt, or from any other cause will not be accepted.

- D. Materials are not acceptable that have been warehoused for long periods of time, stored or transported in improper environment, improperly packaged, inadequately labeled, poorly protected, excessively shipped, deviated from normal distribution pattern, or reassembled.
- E. Contractor shall store material so as to cause no obstructions of sidewalks, roadways, access to the Site or buildings, and underground services. Contractor shall protect material and equipment furnished under Contract.
- F. Contractor may store materials on Site with prior written approval by the District, all material shall remain under Contractor's control and Contractor shall remain liable for any damage to the materials. Should the Project Site not have storage area available, the Contractor shall provide for off-site storage at a bonded warehouse and with appropriate insurance coverage at no cost to District.
- G. When any room in Project is used as a shop or storeroom, the Contractor shall be responsible for any repairs, patching, or cleaning necessary due to that use. Location of storage space shall be subject to prior written approval by District.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Manufacturers listed in various sections of Contract Documents are names of those manufacturers that are believed to be capable of supplying one or more of items specified therein.
- B. The listing of a manufacturer does not imply that every product of that manufacturer is acceptable as meeting the requirements of the Contract Documents.

2.02 FACILITIES AND EQUIPMENT

Contractor shall provide, install, maintain, and operate a complete and adequate facility for handling, the execution, disposal, and distribution of material and equipment as required for proper and timely performance of Work connected with Contract.

2.03 MATERIAL REFERENCE STANDARDS

Where material is specified solely by reference to "standard specifications" and if requested by District, Contractor shall submit for review data on actual material proposed to be incorporated into Work of Contract listing name and address of vendor, manufacturer, or producer, and trade or brand names of those materials, and data substantiating compliance with standard specifications.

PART 3 - EXECUTION

3.01 WORKMANSHIP

- A. Where not more specifically described in any other Contract Documents, workmanship shall conform to methods and operations of best standards and accepted practices of trade or trades involved and shall include items of fabrication, construction, or installation regularly furnished or required for completion (including finish and for successful operation, as intended).
- B. Work shall be executed by tradespersons skilled in their respective lines of Work. When completed, parts shall have been durably and substantially built and present a neat appearance.

3.02 COORDINATION

- A. Contractor shall coordinate installation of Work so as to not interfere with installation of others. Adjustment or rework because of Contractor's failure to coordinate will be at no additional cost to District.
- B. Contractor shall examine in-place work for readiness, completeness, fitness to be concealed or to receive other work, and in compliance with Contract Documents. Concealing or covering Work constitutes acceptance of additional cost which will result should in-place Work be found unsuitable for receiving other Work or otherwise deviating from the requirements of the Contract Documents.

3.03 COMPLETENESS

Contractor shall provide all portions of the Work, unless clearly stated otherwise, installed complete and operational with all elements, accessories, anchorages, utility connections, etc., in manner to assure well-balanced performance, in accordance with manufacturer's recommendations and by Contract Documents. Terms such as "installed complete," "operable condition," "for use intended," "connected to all utilities," "terminate with proper cap," "adequately anchored," "patch and refinish," "to match similar," should be assumed to apply in all cases, except where completeness of functional or operable condition is specifically stated as not required.

3.04 APPROVED INSTALLER OR APPLICATOR

Installation by a manufacturer's approved installer or applicator is an understood part of Specifications and only approved installer or applicator is to provide on-site Work where specified manufacturer has on-going program of approving (i.e. certifying, bonding, re-warranting) installers or applicators. Newly established relationships between a manufacturer and an installer or applicator who does not have other approved applicator work in progress or completed is not approved for this Project.

3.05 MANUFACTURER'S RECOMMENDATIONS

All installations shall be in accordance with manufacturer's published recommendations and specific written directions of manufacturer's representative.

Should Contract Documents differ from recommendations of manufacturer or directions of his representative, Contractor shall analyze differences, make recommendations to the District and the Architect in writing, and shall not proceed until interpretation or clarification has been issued by the District and/or the Architect.

END OF DOCUMENT

QUALITY CONTROL

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Inspector, Inspections and Tests, Uncovering of Work and Non-conforming of Work and Correction of Work;
- B. Special Conditions.

1.02 RELATED CODES:

- A. The Work is governed by requirements of Title 24, California Code of Regulations ("CCR"), and the Contractor shall keep a copy of these available at the job Site for ready reference during construction.
- B. The Division of the State Architect ("DSA") shall be notified at or before the start of construction.

1.03 OBSERVATION AND SUPERVISION:

- A. The District and Architect or their appointed representatives will review the Work and the Contractor shall provide facilities and access to the Work at all times as required to facilitate this review. Administration by the Architect and any consulting Structural Engineer will be in accordance with applicable regulations, including, without limitation, CCR, Part 1, Title 24, Section 4-341.
- B. One or more Project Inspector(s) approved by DSA and employed by or in contract with the District, referred to hereinafter as the "Project Inspector", will observe the work in accordance with CCR, Part 1, Title 24, Sections 4-333(b) and 4-342:
 - (1) The Project Inspector and Special Inspector(s) shall have access to the Work wherever it is in preparation or progress for ascertaining that the Work is in accordance with the Contract Documents and all applicable code sections. The Contractor shall provide facilities and operation of equipment as needed, and access as required and shall provide assistance for sampling or measuring materials.
 - (2) The Project Inspector will notify the District and Architect and call the attention of the Contractor to any observed failure of Work or material to conform to Contract Documents.

The Contractor shall conform with all applicable laws as indicated in the Contract Documents, including, without limitation, to CCR, Part 1, Title 24, Section 4-343.

The Contractor shall supervise and direct the Work and maintain a competent superintendent on the job who is authorized to act in all matters pertaining to the Work. The Contractor's superintendent shall also inspect all materials, as they arrive, for compliance with the Contract Documents. Contractor shall reject defective Work or materials immediately upon delivery or failure of the Work or material to comply with the Contract Documents. The Contractor shall submit verified reports as indicated in the Contract Documents, including, without limitation, the Specifications and as required by Part 1, Title 24, Section 4-336.

1.04 TESTING AGENCIES:

- A. Testing agencies and tests shall be in conformance with the General Documents and the requirements of Part 1, Title 24, Section 4- 335.
- B. Testing and inspection in connection with earthwork shall be under the direction of the District's consulting soils engineer, if any, referred to hereinafter as the "Soils Engineer."
- C. Testing and inspection of construction materials and workmanship shall be performed by a qualified laboratory, referred to hereinafter as the "Testing Laboratory." The Testing Laboratory shall be under direction of an engineer registered in the State of California, shall conform to requirements of ASTM E329, and shall be employed by or in contract with the District.
- D. Testing laboratory shall be approved by the Architect and the Division of the State Architect.
- E. Owner will employ and pay for services of an independent testing labatory to perform specified inspection and testing. Retesting cost for failed test will be Contractors responsibilityand will be back-charged against the contract.

1.05 TESTS AND INSPECTIONS:

- A. The Contractor shall be responsible for notifying the District and Project Inspector of all required tests and inspections. Contractor shall notify the District and Project Inspector at least seventy-two hours (72) hours in advance of performing any Work requiring testing or inspection.
- B. The Contractor shall provide access to Work to be tested and furnish incidental labor, equipment, and facilities to facilitate all inspections and tests.
- C. The District will pay for first inspections and tests required by the "CCR", and other inspections or tests that the District and/or the Architect may direct to have made, including the following principal items:
 - (1) Tests and observations for earthwork and paving.
 - (2) Tests for concrete mix designs, including tests of trial batches.
 - (3) Tests and inspections for structural steel work.
 - (4) Field tests for framing lumber moisture content.

- (5) Additional tests directed by the District that establish that materials and installation comply with the Contract Documents.
 - (6) Tests and observations of welding and expansion anchors.
- D. The District may at its discretion, pay and then back charge the Contractor for:
 - (1) Retests or reinspections, if required, and tests or inspections required due to Contractor error or lack of required identifications of material.
 - (2) Uncovering of work in accordance with Contract Documents.
 - (3) Testing done on weekends, holidays, and overtime will be chargeable to the Contractor for the overtime portion.
 - (4) Testing done off Site.
- E. Testing and inspection reports and certifications:
 - (1) If initially received by Contractor, Contractor shall provide to each of the following a copy of the agency or laboratory report of each test or inspection or certification.
 - (a) The District;
 - (b) The Construction Manager, if any;
 - (c) The Architect;
 - (d) The Consulting Engineer, if any;
 - (e) Other engineers on the Project, as appropriate;
 - (f) The Project Inspector; and
 - (g) The Contractor.
 - (2) When the test or inspection is one required by the CCR, a copy of the report shall also be provided to the DSA.

1.06 LABORATORY REPORTS

- A. After each inspection and test, promptly submit two copies of laboratory report to Owner, Architect, Contractor and DSA.
- B. Include:
 - (1) Date of issue,
 - (2) DSA Application and File numbers,
 - (3) Project title and number,

- (4) Name of inspector,
 - (5) Date and time of sampling or inspection,
 - (6) Identification of product and Specification Section,
 - (7) Location in the Project,
 - (8) Type of inspection or test,
 - (9) Date of test,
 - (10) Results of test,
 - (11) Conformance with Contract Documents.
- C. When requested by Architect, provide interpretation of test results.

1.07 LIMITS ON TESTING LABORATORY AUTHORITY

- A. Laboratory may not release, revoke, alter or enlarge on requirements of Contract Documents.
- B. Laboratory may not approve or accept any portion of the work.
- C. Laboratory may not assume any duties of Contractor.
- D. Laboratory has no authority to stop the work.

PART 2 - PRODUCTS

2.01 TYPE OF TEST AND INSPECTIONS

- A. Testing and inspection shall be in accordance with DSA Form 103 (or current version)
- B. Slump Test
ASTM C 143
- C. Concrete Tests

Testing agency shall test concrete used in the work per the following paragraphs:

- (1) Compressive Strength:
 - (a) Minimum number of tests required: One (1) set of three (3) cylinders for each 100 cubic yards (Sec. 2604(h) 01) of concrete or major fraction thereof, placed in one (1) day. See Title 24, Section 2605(g).

- (b) Two cylinders of each set shall be tested at twenty-eight (28) days. One (1) cylinder shall be held in reserve and tested only when directed by the Architect or District.
- (c) Concrete shall test the minimum ultimate compressive strength in twenty-eight 28 days, as specified on the structural drawings.
- (d) In the event that the twenty-eight (28) day test falls below the minimum specified strength, the effective concrete in place shall be tested by taking cores in accordance with UBC Standard No. 26-13 and tested as required for cylinders.
- (e) In the event that the test on core specimens falls below the minimum specified strength, the concrete will be deemed defective and shall be removed and replaced upon such direction of the Architect, and in a manner acceptable to the Division of the State Architect.

D. Reinforcing, Steel

PART 3 - EXECUTION Not Used.

END OF DOCUMENT

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Requirements for Testing Laboratory.
 - 2. Contractor's responsibilities for facilitation of Testing and Inspections.

1.2 RELATED SECTIONS AND DOCUMENTS

- A. Geologic Hazards & Soils Report.
- B. DSA 103 - Structural Test & Inspections List.
- C. Section 31 0000, Earthwork.
- D. Individual Specification Sections: Inspections and tests required, and standards for testing.

1.3 REFERENCES

- A. California Administrative Code (CAC), edition as noted on the drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Building Code (CBC), edition as noted on the drawings, as adopted by the California Division of the State Architect (DSA).

1.4 SELECTION AND PAYMENT

- A. Testing laboratory shall be approved by both the Architect and the Division of the State Architect.
- B. Owner will employ and pay for services of an independent testing laboratory to perform specified inspection and testing. Retesting costs for failed tests will be the Contractors responsibility and will be back-charged against the contract.
- C. Under provisions for Relocatable Building construction, Owner limits his exposure to in-plant inspection and testing costs. Refer to other Specification Sections related to such specific construction.
- D. Employment of testing laboratory shall in no way relieve Contractor of obligation to perform work in accordance with requirements of Contract Documents.

1.5 LABORATORY REPORTS

- A. After each inspection and test, promptly submit two copies of laboratory report to Owner, Architect, Contractor and DSA.
- B. Include:
 - 1. Date of issue,

TESTING AND INSPECTION SERVICES

SECTION 01 4523

3595001

2. DSA Application and File numbers,
3. Project title and number,
4. Name of inspector,
5. Date and time of sampling or inspection,
6. Identification of product and Specification Section,
7. Location in the Project,
8. Type of inspection or test,
9. Date of test,
10. Results of test,
11. Conformance with Contract Documents.

C. When requested by Architect, provide interpretation of test results.

1.6 LIMITS ON TESTING LABORATORY AUTHORITY

- A. Laboratory may not release, revoke, alter or enlarge on requirements of Contract Documents.
- B. Laboratory may not approve or accept any portion of the work.
- C. Laboratory may not assume any duties of Contractor.
- D. Laboratory has no authority to stop the work.

1.7 CONTRACTOR RESPONSIBILITIES

- A. Deliver to laboratory at designated location, adequate samples of materials proposed to be used which require testing, along with proposed mix designs. Allow reasonable time for review and testing.
- B. Arrange for, and coordinate with, laboratory for all required testing and inspection. Provide adequate notice, in advance, for proper scheduling and processing of testing. The Inspector will not be responsible for scheduling or arranging for testing and inspection services.
- C. Cooperate with laboratory personnel, and provide access to the work and to manufacturer's facilities.
- D. Provide incidental labor and facilities to provide access to work to be tested, to obtain and handle samples at the site or at the source of products to be tested, to facilitate tests and inspections, storage and curing of test samples.
- E. Notify Architect, Inspector, Structural Engineer (when applicable) and laboratory 24 hours prior to expected time for operations requiring inspection and testing services.

END OF SECTION

TEMPORARY FACILITIES AND CONTROLS

PART 1 – GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions;
- B. Special Conditions;
- C. Site Standards; and
- D. Construction Waste Management and Disposal.

1.02 TEMPORARY UTILITIES:

A. Electric Power and Lighting:

- (1) Contractor will pay for power during the course of the Work. To the extent power is available in the building(s) or on the Site, Contractor may use the District's existing utilities by making prearranged payments to the District for the utilities used by Contractor and all Subcontractors. Contractor shall be responsible for providing temporary facilities required to deliver that power service from its existing location in the building(s) or on the Site to point of intended use.
- (2) Contractor shall verify characteristics of power available in building(s) or on the Site. Contractor shall take all actions required to make modifications where power of higher voltage or different phases of current are required. Contractor shall be fully responsible for providing that service and shall pay all costs required therefor.
- (3) Contractor shall furnish, wire for, install, and maintain temporary electrical lights wherever it is necessary to provide illumination for the proper performance and/or observation of the Work: a minimum of 20 foot-candles for rough work and 50 foot-candles for finish work.
- (4) Contractor shall be responsible for maintaining existing lighting levels in the project vicinity should temporary outages or service interruptions occur.

B. Water:

- (1) Contractor shall pay for water used during the course of the Work. Contractor shall coordinate and pay for installation or use of water meter in compliance with local water agency requirements. To the

extent water is then available in the building(s) or on the Site, Contractor may use the District's existing utilities by making prearranged payments to the District for the utilities used by Contractor and all Subcontractors. Contractor shall be responsible for providing temporary facilities required to deliver such utility service from its existing location in the building(s), on the Site, or other location approved by the local water agency, to point of intended use.

- (2) Contractor shall use backflow preventers on water lines at point of connection to District's water supply. Backflow preventers shall comply with requirements of Uniform Plumbing Code.
- (3) Contractor shall make potable water available for human consumption.

C. Sanitary Facilities:

- (1) Contractor shall provide sanitary temporary facilities in no fewer numbers than required by law and such additional facilities as may be directed by the Inspector for the use of all workers. The facilities shall be maintained in a sanitary condition at all times and shall be left at the Site until removal is directed by the Inspector or Contractor completes all other work at the Site.
- (2) Use of toilet facilities in the Work under construction shall not be permitted except by consent of the Inspector and the District.

D. Fire Protection:

- (1) Contractor shall provide and maintain fire extinguishers and other equipment for fire protection. Such equipment shall be designated for use for fire protection only and shall comply with all requirements of the California Fire, State Fire Marshall and/or its designee.
- (2) Where on-site welding and burning of steel is unavoidable, Contractor shall provide protection for adjacent surfaces.

E. Trash Removal:

- (1) Contractor shall provide trash removal on a timely basis. Under no circumstance shall Contractor use District trash service.

F. Field Office:

- (1) If Contractor chooses to provide a field office, it shall be an acceptable construction trailer that is well-lit and ventilated. The construction trailer shall be equipped with shelves, desks, filing cabinet, chairs, and such other items of equipment needed. Trailer and equipment are the property of the Contractor and must be removed from the Site upon completion of the Work.
- (2) Contractor shall provide any additional electric lighting and power required for the trailer. Contractor shall make adequate provisions for heating and cooling as required.

1.03 CONSTRUCTION AIDS:

- A. Plant and Equipment:
 - (1) Contractor shall furnish, operate, and maintain a complete plant for fabricating, handling, conveying, installing, and erecting materials and equipment; and for conveyances for transporting workers. Include elevators, hoists, debris chutes, and other equipment, tools, and appliances necessary for performance of the Work.
 - (2) Contractor shall maintain plant and equipment in safe and efficient operating condition. Damages due to defective plant and equipment, and uses made thereof, shall be repaired by Contractor at no expense to the District.
- B. None of the District's tools and equipment shall be used by Contractor for the performance of the Work.

1.04 BARRIERS AND ENCLOSURES:

- A. Contractor shall obtain the District's written permission for locations and types of temporary barriers and enclosures, including fire-rated materials proposed for use, prior to their installation.
- B. Contractor shall provide and maintain temporary enclosures to prevent public entry and to protect persons using other buildings and portions of the Site and/or Premises, the public, and workers. Contractor shall also protect the Work and existing facilities from the elements, and adjacent construction and improvements, persons, and trees and plants from damage and injury from demolition and construction operations.
- C. Contractor shall provide site access to existing facilities for persons using other buildings and portions of the Site, the public, and for deliveries and other services and activities.
- D. Tree and Plant Protection:
 - (1) Contractor shall preserve and protect existing trees and plants on the Premises that are not designated or required to be removed, and those adjacent to the Premises.
 - (2) Contractor shall provide barriers to a minimum height of 4'-0" around drip line of each tree and plant, around each group of trees and plants, as applicable, in the proximity of demolition and construction operations, or as denoted on the Plans.
 - (3) Contractor shall not park trucks, store materials, perform Work or cross over landscaped areas. Contractor shall not dispose of paint thinners, water from cleaning, plastering or concrete operations, or other deleterious materials in landscaped areas, storm drain systems, or sewers. Plant materials damaged as a result of the performance of the Work shall, at the option of the District and at Contractor's expense, either be replaced with new plant materials equal in size to

those damaged or by payment of an amount representing the value of the damaged materials as determined by the District.

- (4) Contractor shall remove soil that has been contaminated during the performance of the Work by oil, solvents, and other materials which could be harmful to trees and plants, and replace with good soil, at Contractor's expense.
- (5) Excavation around Trees:
 - (a) Excavation within drip lines of trees shall be done only where absolutely necessary and with written permission from the District.
 - (b) Where trenching for utilities is required within drip lines, tunneling under and around roots shall be by hand digging and shall be approved by the District. Main lateral roots and taproots shall not be cut. All roots 2 inches in diameter and larger shall be tunneled under and heavily wrapped with wet burlap so as to prevent scarring or excessive drying. Smaller roots that interfere with installation of new work may be cut with prior approval by the District. Roots must first be cut with a Vermeer, or equivalent, root cutter prior to any trenching.
 - (c) Where excavation for new construction is required within drip line of trees, hand excavation shall be employed to minimize damage to root system. Roots shall be relocated in backfill areas wherever possible. If encountered immediately adjacent to location of new construction, roots shall be cut approximately 6 inches back from new construction.
 - (d) Approved excavations shall be carefully backfilled with the excavated materials approved for backfilling. Backfill shall conform to adjacent grades without dips, sunken areas, humps, or other surface irregularities. Do not use mechanical equipment to compact backfill. Tamp carefully using hand tools, refilling and tamping until Final Acceptance as necessary to offset settlement.
 - (e) Exposed roots shall not be allowed to dry out before permanent backfill is placed. Temporary earth cover shall be provided, or roots shall be wrapped with four layers of wet, untreated burlap and temporarily supported and protected from damage until permanently relocated and covered with backfill.
 - (f) Accidentally broken roots should be sawed cleanly 3 inches behind ragged end.

1.05 SECURITY:

The Contractor shall be responsible for project security for materials, tools, equipment, supplies, and completed and partially completed Work.

1.06 TEMPORARY CONTROLS:

A. Noise Control:

- (1) Contractor acknowledges that adjacent facilities may remain in operation during all or a portion of the Work period, and it shall take all reasonable precautions to minimize noise as required by applicable laws and the Contract Documents.
- (2) Notice of proposed noisy operations, including without limitation, operation of pneumatic demolition tools, concrete saws, and other equipment, shall be submitted to the District a minimum of forty-eight (48) hours in advance of their performance.

B. Noise and Vibration:

- (1) Equipment and impact tools shall have intake and exhaust mufflers.
- (2) Contractor shall cooperate with District to minimize and/or cease the use of noisy and vibratory equipment if that equipment becomes objectionable by its longevity.

C. Dust and Dirt:

- (1) Contractor shall conduct demolition and construction operations to minimize the generation of dust and dirt, and prevent dust and dirt from interfering with the progress of the Work and from accumulating in the Work and adjacent areas including, without limitation, occupied facilities.
- (2) Contractor shall periodically water exterior demolition and construction areas to minimize the generation of dust and dirt.
- (3) Contractor shall ensure that all hauling equipment and trucks carrying loads of soil and debris shall have their loads sprayed with water or covered with tarpaulins, and as otherwise required by local and state ordinance.
- (4) Contractor shall prevent dust and dirt from accumulating on walks, roadways, parking areas, and planting, and from washing into sewer and storm drain lines.

D. Water:

- (1) Contractor shall not permit surface and subsurface water, and other liquids, to accumulate in or about the vicinity of the Premises. Should accumulation develop, Contractor shall control the water or other liquid, and suitably dispose of it by means of temporary pumps, piping, drainage lines, troughs, ditches, dams, or other methods.

E. Pollution:

- (1) No burning of refuse, debris, or other materials shall be permitted on or in the vicinity of the Premises.
- (2) Contractor shall comply with applicable regulatory requirements and anti-pollution ordinances during the conduct of the Work including, without limitation, demolition, construction, and disposal operations.

F. Lighting:

- (1) If portable lights are used after dark, all light must be located so as not to direct light into neighboring property.

1.07 PUBLICITY RELEASES:

- A. Contractor shall not release any information, story, photograph, plan, or drawing relating information about the Project to anyone, including press and other public communications medium, including, without limitation, on website(s) without the written permission of the District.

PART 2 – PRODUCTS Not used.

PART 3 – EXECUTION Not used.

END OF DOCUMENT

CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions;
- B. Special Conditions; and
- C. Temporary Facilities and Controls.

1.02 SECTION INCLUDES:

- A. Administrative and procedural requirements for the following:
 - (1) Salvaging non-hazardous construction waste.
 - (2) Recycling non-hazardous construction waste.
 - (3) Disposing of non-hazardous construction waste.

1.03 DEFINITIONS:

- A. Construction Waste: Building and site improvement materials and other solid waste resulting from construction, remodeling, renovation, or repair operations. Construction waste includes packaging.
- B. Demolition Waste: Building and site improvement materials resulting from demolition or selective demolition operations.
- C. Disposal: Removal off-site of demolition and construction waste and subsequent sale, recycling, reuse, or deposit in landfill or incinerator acceptable to authorities having jurisdiction.
- D. Recycle: Recovery of demolition or construction waste for subsequent processing in preparation for reuse.
- E. Salvage: Recovery of demolition or construction waste and subsequent sale or reuse in another facility.
- F. Salvage and Reuse: Recovery of demolition or construction waste and subsequent incorporation into the Work.

1.04 PERFORMANCE REQUIREMENTS:

- A. General: Develop waste management plan that results in end-of Project rates for salvage/recycling of sixty-five percent (65%) by weight (or by volume, but not a combination) of total waste generated by the Work.

1.05 SUBMITTALS:

- A. Waste Management Plan: Submit waste management plan within 30 days of date established for commencement of the Work.
- B. Waste Reduction Progress Reports: Concurrent with each Application for Payment, submit copies of report. Include the following information:
 - (1) Material category.
 - (2) Generation point of waste.
 - (3) Total quantity of waste in tons or cubic yards.
 - (4) Quantity of waste salvaged, both estimated and actual in tons or cubic yards.
 - (5) Quantity of waste recycled, both estimated and actual in tons or cubic yards.
 - (6) Total quantity of waste recovered (salvaged plus recycled) in tons or cubic yards.
 - (7) Total quantity of waste recovered (salvaged plus recycled) as a percentage of total waste.
- C. Waste Reduction Calculations: Before request for final payment, submit copies of calculated end-of-Project rates for salvage, recycling, and disposal as a percentage of total waste generated by the Work.
- D. Records of Donations: Indicate receipt and acceptance of salvageable waste donated to individuals and organizations. Indicate whether organization is tax exempt.
- E. Records of Sales: Indicate receipt and acceptance of salvageable waste sold to individuals and organizations. Indicate whether organization is tax exempt.
- F. Recycling and Processing Facility Records: Indicate receipt and acceptance of recyclable waste by recycling and processing facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.
- G. Landfill and Incinerator Disposal Records: Indicate receipt and acceptance of waste by landfills and incinerator facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.

- H. Qualification Data: For Waste Management Coordinator.
- I. Submittal procedures and quantities are specified in Document 01 33 00.

1.06 QUALITY ASSURANCE:

- A. Waste Management Coordinator Qualifications: LEED Accredited Professional by U.S. Green Building Council.
- B. Regulatory Requirements: Comply with hauling and disposal regulations of authorities having jurisdiction.
- C. Waste Management Conference: Conduct conference at Project site to comply with requirements. Review methods and procedures related to waste management including, but not limited to, the following:
 - (1) Review and discuss waste management plan including responsibilities of Waste Management Coordinator.
 - (2) Review requirements for documenting quantities of each type of waste and its disposition.
 - (3) Review and finalize procedures for materials separation and verify availability of containers and bins needed to avoid delays.
 - (4) Review procedures for periodic waste collection and transportation to recycling and disposal facilities.
 - (5) Review waste management requirements for each trade.

1.07 WASTE MANAGEMENT PLAN:

- A. General: Develop plan consisting of waste identification, waste reduction work plan, and cost/revenue analysis. Indicate quantities by weight or volume, but use same units of measurement throughout waste management plan.
- B. Waste Identification: Indicate anticipated types and quantities of site-clearing and construction waste generated by the Work. Include estimated quantities and assumptions for estimates.
- C. Waste Reduction Work Plan: List each type of waste and whether it will be salvaged, recycled, or disposed of in landfill or incinerator. Include points of waste generation, total quantity of each type of waste, quantity for each means of recovery, and handling and transportation procedures.
 - (1) Salvaged Materials for Reuse: For materials that will be salvaged and reused in this Project, describe methods for preparing salvaged materials before incorporation into the Work.

- (2) Salvaged Materials for Sale: For materials that will be sold to individuals and organizations, include list of their names, addresses, and telephone numbers.
- (3) Salvaged Materials for Donation: For materials that will be donated to individuals and organizations, include list of their names, addresses, and telephone numbers.
- (4) Recycled Materials: Include list of local receivers and processors and type of recycled materials each will accept. Include names, addresses, and telephone numbers.
- (5) Disposed Materials: Indicate how and where materials will be disposed of. Include name, address, and telephone number of each landfill and incinerator facility.
- (6) Handling and Transportation Procedures: Include method that will be used for separating recyclable waste including sizes of containers, container labeling, and designated location on Project site where materials separation will be located.

PART 2 - PRODUCTS Not Used.

PART 3 - EXECUTION

3.01 PLAN IMPLEMENTATION:

- A. General: Implement approved waste management plan. Provide handling, containers, storage, signage, transportation, and other items as required to implement waste management plan during the entire duration of the Contract.
 - (1) Comply with Document 01 50 00 for operation, termination, and removal requirements.
- B. Training: Train workers, subcontractors, and suppliers on proper waste management procedures, as appropriate for the Work occurring at Project site.
 - (1) Distribute waste management plan to everyone concerned within 3 days of submittal return.
 - (2) Distribute waste management plan to entities when they first begin work on site. Review plan procedures and locations established for salvage, recycling, and disposal.
- C. Site Access and Temporary Controls: Conduct waste management operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.

- (1) Designate and label specific areas of Project site necessary for separating materials that are to be salvaged, recycled, reused, donated, and sold.
- (2) Comply with Document 01 50 00 for controlling dust and dirt, environmental protection, and noise control.

3.02 RECYCLING CONSTRUCTION WASTE:

- A. General: Recycle paper and beverage containers used by on-site workers.
- B. Recycling Incentives: Revenues, savings, rebates, tax credits, and other incentives received for recycling waste materials shall accrue to the Contractor.
- C. Procedures: Separate recyclable waste from other waste materials, trash, and debris. Separate recyclable waste by type at Project site to the maximum extent practical.
 - (1) Provide appropriately marked containers or bins for controlling recyclable waste until they are removed from Project Site. Include list of acceptable and unacceptable materials at each container and bin.
 - (a) Inspect containers and bins for contamination and remove contaminated materials if found.
 - (2) Stockpile processed materials on site without intermixing with other materials. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
 - (3) Stockpile materials away from construction area. Do not store within drip line of remaining trees.
 - (4) Store components off the ground and protect from the weather.
 - (5) Remove recyclable waste off District property and transport to recycling receiver or processor.
- D. Packaging:
 - (1) Cardboard and Boxes: Break down packaging into flat sheets. Bundle and store in a dry location.
 - (2) Polystyrene Packaging: Separate and bag material.
 - (3) Pallets: As much as possible, require deliveries using pallets to remove pallets from Project Site. For pallets that remain on Site, break down pallets into component wood pieces and comply with requirements for recycling wood.
 - (4) Crates: Break down crates into component wood pieces and comply with requirements for recycling wood.

- E. Site-Clearing Wastes: Chip brush, branches, and trees on site.
- F. Wood Materials:
 - (1) Clean Cut-Offs of Lumber: Grind or chip into small pieces.
 - (2) Clean Sawdust: Bag sawdust that does not contain painted or treated wood.

3.03 DISPOSAL OF WASTE:

- A. General: Except for items or materials to be salvaged, recycled, or otherwise reused, remove waste materials from Project Site and legally dispose of them in a landfill or incinerator acceptable to authorities having jurisdiction.
 - (1) Except as otherwise specified, do not allow waste materials that are to be disposed of accumulate on site.
 - (2) Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
- B. Burning: Do not burn waste materials.
- C. Disposal: Transport waste materials off District property and legally dispose of them.

END OF DOCUMENT

FIELD OFFICES

PART 1 – GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions;
- B. Special Conditions; and
- C. Temporary Facilities and Controls.

1.02 SECTION INCLUDES:

- A. Requirements for Field Offices and Field Office Trailers.

1.03 SUMMARY:

- A. General: Contractor shall provide District's Field Office Trailer and contents, for District's use exclusively, during the term of the Contract.
- B. Property: Trailer, furniture, furnishings, equipment, and the like, supplied by the Contractor with the Office Trailer shall remain the property of the Contractor; District property items installed, delivered, and the like by District within the Office Trailer will remain District's property.
- C. Modifications: District reserves the right to modify the trailer or contents, or both, as may be deemed proper by District.
- D. Condition: Trailer and contents shall be clean, neat, substantially finished, in good, proper, and safe condition for use, operation, and the like; the trailer and contents shall not be required to be new.
- E. Installation Timing: Provide safe, fully furnished, functional, proper, complete, and finished trailer properly ready for entire use, within fourteen (14) calendar days of District's notification of the issuance of Notice to Proceed.

1.04 SUBMITTALS:

- A. General: Submit submittals to District in quantity, format, type, and the like, as specified herein.
- B. Office Trailer Data: One (1) copy of manufacturer's descriptive data, technical descriptions, regulatory compliance, industry standards, installation, removal, and maintenance instructions.

- C. Equipment Data: Two (2) copies of manufacturer data for each type of equipment, if directed by District.
- D. Furniture and Furnishings Data: Two (2) copies of manufacturer data for each type of equipment, if directed by District.
- E. Plans: One (1) reproducible copy of appropriately scaled plans of trailer layout. Plans shall include, but not be limited to: lighting; furniture; equipment; telephone and electrical outlets; and the like.
- F. Product Samples: One (1) complete and entire unit of each type, if directed by District.

1.05 QUALITY ASSURANCE

- A. Standards: In the event that provisions of codes, regulations, safety orders, Contract Documents, referenced manufacturer's specifications, manufacturer's instructions, industry standards, and the like, are in conflict, the more restrictive and higher quality shall govern.
- B. Installer: Installer or Installers engaged by Contractor must have a minimum of five (5) years of documented and properly authenticated successful experience of specialization in the installation of the items or systems, or both, specified herein.
- C. Manufacturer: Contractor shall obtain products from nationally and industry recognized Manufacturer with five (5) years minimum, of immediately recent, continuous, documented and properly authenticated successful experience of specialization in the manufacture of the product specified herein.
- D. State Personnel Training: Provide proper training for maintenance and operations, including emergency procedures, and the like, as directed by District.
- E. Units: Shall be sound and free of defects, and shall not include any damage or defect that will impair the safety, installation, performance, or the durability of the entire Office Trailer and appurtenant systems.

1.06 REGULATORY REQUIREMENTS

- A. General: Work shall be executed in accordance with applicable Codes, Regulations, Statutes, Enactments, Rulings, Laws, each authority having jurisdiction, and including, but not limited to, Regulatory Requirements specified herein.
- B. California Building Standards Code ("CBSC").
- C. California Code of Regulations, Title 25, Chapter 3, Sub Chapter 2, Article 3 ("CCR").
- D. Coach Insignia: Trailer shall display California Commercial Coach Insignia; such insignia shall be deemed to show that the trailer is in accordance with the Construction and Fire Safety requirements of CCR.

PART 2 – PRODUCTS

2.01 FIELD OFFICE TRAILER

- A. General: Provide entire Field Office Trailer of type, function, operation, capacity, size, complete with controls, safety devices, accessories, and the like, for proper and durable installation. Partitions, walls, ceiling, and other interior and exterior surfaces shall be appropriately finished, including, but not limited to, trim, painting, wall base, floor covering, suspended or similar ceiling, and the like; provide systems, components, units, nuts, bolts, screws, anchoring devices, fastening devices, washers, accessories, adhesives, sealants, and other items of type, grade, and class required for the particular use, not identified but required for a complete, weather-tight, appropriately operating, and finished installation.
- B. Manufacturers: General Electric Capital Modular Space; The Space Place, Inc.; or equal.
- C. Program: Provide a wheel-mounted trailer with stairs, landings, platforms, ramps, and the like, in good, proper, safe, clean, and properly finished condition; with proper heavy duty locks, and other proper and effective security at all doors, windows, and the like. Trailer shall be maintained in good, proper, safe, clean, and properly finished condition during the Contract.
 - (1) Nominal Trailer Size: Four hundred eighty (480) square feet, minimum.
 - (2) Stairs, Platform: Properly finished stairs, platforms, and ramps.
 - (3) Doors: Two (2), three (3) foot wide exterior doors with locksets; finished ramp, steps, and entry platform at each exterior door.
 - (4) Keys: Submit five (5) keys for each door, window, furniture unit, and the like. There shall be no other key copies or originals available; each key shall be identified for District; and shall be labeled, or tagged
 - (5) Lighting: Sixty-five (65) foot-candles illumination minimum at any point, at thirty (30) inches above finished floor throughout from fluorescent light source, exclusively, or as directed by District.
 - (6) Electrical Outlets: One (1) duplex outlet evenly spaced every twelve (12) linear horizontal feet of wall face, and electrical service ready for use.

2.02 FIELD OFFICE TRAILER ITEMS

- A. General: Provide the Field Office Trailer with the following arranged into two (2) workstations:
 - (1) Desks: Two (2) desks: thirty-six (36) inches by sixty (60) inches; steel, laminated plastic top; locking, one (1) or two (2) file drawers single pedestal; steel; provide five (5) keys to District.

- (2) Tables: Two (2) tables; thirty-six (36) inches by sixty (60) inches; twenty-nine (29) inches high; steel, laminated plastic top tables; one (1) at each desk.
 - (3) Chairs: Two (2) chairs: swivel; steel; with seat cushion and arms; one (1) at each desk.
 - (4) Waste Baskets: Two (2) waste baskets, one at each desk.
- B. Furniture and Equipment: Provide in the space located to effect efficient and logical use.
- (1) File cabinet: One (1); four (4) drawer; lateral; steel locking.
 - (2) Plan Table: One (1) plan table: thirty-six (36) inches deep by seventy-two (72) inches wide by forty-two (42) inches high; adjustable; wood or steel; with lockable plan and pencil drawers.
 - (3) Drafting Stool: One (1) drafting stool; swiveling; steel; padded; adjustable; with footrest and casters.
 - (4) Bookshelf: One (1) bookshelf: thirty-six (36) inches deep by seventy-two (72) inches wide by forty-two (42) inches high; adjustable; wood or steel; with lockable plan and pencil drawer.
 - (5) Plan Rack: One (1) wheel mounted plan rack.
 - (6) Waste Baskets: One (1) large waste basket.
 - (7) Coat/Hat Hanger: Wall mounted with minimum capacity for four (4) garments and ten (10) hats.
 - (8) Document Management System: Shall include an integrated high-volume printer, copier, and facsimile machine, including stand, base, and storage cabinet; and shall include the following features:
 - (a) Type: Laser, dry electrostatic transfer, plain paper, digital, multi-function imaging system.
 - (b) Network: Ethernet or Token Ring network ready, Plug-and-Play.
 - (c) Print, send/receive facsimile from any connected workstation.
 - (d) Resolution: Six hundred (600) dots per inch by six hundred (600) dots per inch, minimum.
 - (e) Print Speed: Twenty (20) pages per minute, minimum.
 - (f) Copies: Twenty (20) copies per minute, minimum.
 - (g) Document Handler: Forty (40) sheet, minimum

- (h) Collator: Forty (40) bin, minimum, with stapling.
- (i) Duplexing: Capable.
- (j) Paper Size: Capable of handling paper sizes to eleven (11) inches by seventeen (17) inches.
- (k) Paper Cassettes: One (1) each for eight and one half (8.5) inches by eleven (11) inches, eight and one half (8.5) inches by fourteen (14) inches, and eleven (11) inches by seventeen (17) inches paper sizes; minimum two hundred fifty (250) sheets per cassette.
- (l) Reduction/Enlargement: Capable of reduction to twenty-five percent (25%) and enlargement to two hundred percent (200%).
- (m) Facsimile Electronic Storage: Capable of storing minimum of fifty (50) speed dial numbers, group faxing and broadcast faxing.
- (n) Facsimile Scanning: Capable of scanning into memory a minimum of one hundred (100) pages with maximum scan time of three (3) seconds per page.
- (o) Halftone: Sixty-four (64) levels.
- (p) Redial: Automatic and Manual.
- (9) Maintenance: Contractor shall purchase service agreements for each unit of equipment for the duration of the project plus two (2) months, and shall maintain all equipment in proper working condition. Service agreements shall include provision for replacement of toner cartridges and other items required to effect proper unit use. Service agreements shall also provide for:
 - (a) Unlimited Service Calls.
 - (b) Same Day Response.
 - (c) All parts, labor, preventative maintenance and mileage.
 - (d) All chemicals, such as toner, fixing agent, and the like.
 - (e) System training and setup.
- (10) Portable Toilets: Two (2); each shall include a urinal; each unit shall be a properly enclosed chemical unit conforming to ANSI Z4.3.
 - (a) Location: As directed by District.
 - (b) Maintenance: Maintain each unit and surrounding areas in a clean, hygienic and orderly manner, at all time. Empty, clean,

and sanitize each unit each day at a location and time as directed by District.

- (c) Removal: Relocate, or remove from the site, each Portable Toilet. Upon such directive by District, the Contractor shall forthwith relocate or remove each Portable Toilet and submit the affected areas to a condition which existed prior to the installation of each Portable Toilet, within three (3) calendar days, or as directed by District in writing, at no cost to District.

2.03 UTILITY AND SERVICES

- A. Telephone Service: Contractor shall provide and interface the entire telephone service, and shall properly and timely pay for telephone service for District's non-long-distance use.
- B. Electrical Service: Provide all proper connections and continuously pay for service for the duration of the Work.

2.04 FINISHES

- A. General: Manufacturer standard finish system over surfaces properly cleaned, pretreated, and prepared to obtain proper bond; all visible surfaces shall be coated.
- B. Finish: Color as selected by District from manufacturer standard palette.

PART 3 – EXECUTION

3.01 INSTALLATION

- A. General: Properly prepare area and affected items to receive the Work. Set Work accurately in location, alignment, and elevation; rigidly, securely, and firmly anchor to appropriate structure; install plumb, straight, square, level, true, without racking, rigidly anchored to proper solid blocking, substrate, and the like; provide appropriate type and quantity of reinforcements, fasteners, adhesives, self-adhesive and other tapes; lubricants, coatings, accessories, and the like, as required for a complete, structurally rigid, stable, sound, and appropriately finished installation, in accordance with manufacturer's published instructions, and as indicated. The more restrictive and higher quality requirement shall govern. Moving parts shall be properly secured, without binding, looseness, noise, and the like.
- B. Installation: Install in accordance with 25 CCR 3.2.3 and as directed by District; jack up trailer and level both ways; mount on proper concrete piers with all load off wheels; provide required tie down and accessories per Section 4368 of referenced CCR, and as directed by District.
- C. Rejected Work: Work, materials, unit, items, systems, and the like, not accepted by District shall be deemed rejected, and shall forthwith be removed and replaced with proper and new Work, materials, unit, items, systems, and the like at no cost to District.

- D. Standard: Comply with manufacturer's published instructions, or with instructions as shown or indicated; the more restrictive and higher quality requirement shall govern.
- E. Location: As directed by District.
- F. Fire Resistance: Construct and install in accordance with UL requirements.
- G. Maintenance: Contractor shall maintain trailer and adjacent areas in a safe, clean and hygienic condition throughout the duration of the Work, and as directed by District. Properly repair or replace furniture or other items, as directed by District. Properly remove unsafe, damaged, or broken furniture, or similar items, and replace with safe and proper items. Contractor shall pay cost of all services, repair, and maintenance, or replacement of each item.
- H. Janitorial Service: Provide professional janitorial services, including, but not limited to, trash, waste paper baskets, fill paper dispensers; clean and dust all furniture, files, and the like; sweep and mop resilient and similar flooring; and vacuum carpeting and similar flooring.
 - (1) Frequency: Two (2) times per week, minimum.
- I. Removal: Properly remove the Office Trailer and contents from the Site upon completion of the Contract, or as directed by District in writing. Forthwith properly patch and repair affected areas; replace damaged items with new items. Carefully and properly inventory, clean, pack, store, and protect District property; submit District property to District at a date, time and location as directed by District.

END OF DOCUMENT

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: VOC restrictions for product categories listed below under Article "DEFINITIONS" and in compliance with the following.
 - 1. California Code of Regulations, Title 24, Part 11 California Green Building Standards Code.
 - 2. Local Agency.
 - 3. No Rating System is applicable.
- B. Products of each category that are installed in the project must comply; applicable laws and ordinances do not allow for partial compliance.
- C. Listing of a product in these Specifications shall not be construed as a solicitation or requirement to use any product or combination of products in violation of the requirements of South Coast Air Quality Management District Rule No.1168, as described in Rule 1168(g).
 - 1. If a listed product does not meet the requirements of this rule, request approval for use of an alternate product by the same or another manufacturer meeting the requirements of this rule.
 - 2. Do not use products which do not meet the requirements of this rule.

1.2 RELATED REQUIREMENTS

- A. Divisions 01 through 33 contain related requirements specific to the work of each of these Sections. Requirements may or may not include reference to this Section.
- B. Section 01 8113, Sustainable Design Requirements, for CAL-Green general requirements and procedures.

1.3 REFERENCES

- A. California Green Building Standards Code (CALGreen), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. Low-Emitting Materials Product List; California Collaborative for High Performance Schools (CHPS); current edition at www.chps.net/.
- C. CRI (GLCC) - Green Label Testing Program - Approved Product Categories for Carpet Cushion; Carpet and Rug Institute; current edition.
- D. CRI (GLP) - Green Label Plus Carpet Testing Program - Approved Products; Carpet and Rug Institute; current edition.
- E. GEI (SCH) - GREENGUARD "Children and Schools" Certified Products; GREENGUARD Environmental Institute; current listings at www.greenguard.org.

VOLATILE ORGANIC COMPOUND (VOC) RESTRICTIONS

SECTION 01 6116

3595001

- F. GreenSeal GS-36 - Commercial Adhesives; Green Seal, Inc.
- G. SCAQMD 1168 - South Coast Air Quality Management District Rule No.1168; current edition; www.aqmd.gov.
- H. SCS (CPD) - SCS Certified Products; Scientific Certification Systems; current listings at www.scs-certified.com.

1.4 DEFINITIONS

- A. VOC-Restricted Products: Products of each of the following categories when installed or applied on-site:
 - 1. Adhesives, sealants, and sealer coatings, regardless of specification Section or Division.
 - 2. Paints and coatings.
 - 3. Carpet and resilient flooring.
 - 4. Composite wood products; plywood, particleboard, wood fiberboard.
- B. Adhesives: Gunnable, trowelable, liquid-applied, and aerosol adhesives, whether specified or not; including flooring adhesives, resilient base adhesives, and pipe jointing adhesives.
- C. Sealants: Gunnable, trowelable, and liquid-applied joint sealants and sealant primers, whether specified or not; including firestopping sealants and duct joint sealers.

1.5 SUBMITTAL REQUIREMENTS

- A. Product Data: For each VOC-restricted product used in the project, submit product data showing compliance, except when another type of evidence of compliance is required.
- B. Verification of Compliance: Submit for each different product in each applicable category.
 - 1. Identify evidence submittals with the words "CALGreen VOC Compliance Report".
- C. Installer Certifications for Accessory Materials:
 - 1. Require each installer of any type of product, not just the products for which VOC restrictions are specified, to certify that either 1) no adhesives, joint sealants, paints, coatings, or composite wood or agrifiber products have been used in the installation of their products, or 2) that such products used comply with these requirements.
 - 2. Use the form following at the end of Part 3 in this Section for Installer certifications.

1.6 QUALITY ASSURANCE

- A. Manufacturer's Testing Agency Qualifications: Independent firm specializing in performing testing and inspections of the type specified in this Section.

VOLATILE ORGANIC COMPOUND (VOC) RESTRICTIONS
SECTION 01 6116
3595001

PART 2 - PRODUCTS

2.1 MATERIALS

A. General:

1. Provide products conforming to local, State and Federal government requirements limiting the amount of volatile organic compounds contained in the product, for its intended application. If specified product exceeds current requirement, provide conforming product at no additional cost.
2. Provide only products having volatile organic compound (VOC) content not greater than required by South Coast Air Quality Management District Rule No.1168 and less where required by code.
3. Products are specified in multiple Sections throughout these Specifications.

B. Composite Wood Products: Comply with CALGreen Section 5.504 and Table 5.504.4.5 formaldehyde limits for hardwood plywood, particleboard, and medium density fiberboard composite wood products used on the interior and exterior of the building.

1. Verification of Compliance: Acceptable types are:
 - a. Certification by manufacturer that product complies with requirements.
 - b. Published product data showing compliance with requirements.
 - c. Chain of custody certifications.
 - d. Product labeled and invoiced as meeting the Composite Wood Products regulation (CCR, Title 17, Section 93120, et seq.).
 - e. Products marked as meeting the PS-1 or PS-2 standards of the Engineered Wood Association, the Australian AS/NZS 2269, or European 636 3S standards.
 - f. Other method acceptable to enforcing agency.

Table 5.504.4.5 FORMALDEHYDE LIMITS	
Maximum Formaldehyde Emissions in Parts per Million	
Product	Current Limit
Hardwood plywood veneer core	0.05
Hardwood plywood composite core	0.05
Particleboard	0.09
Medium density fiberboard	0.11
Thin medium density fiberboard ¹	0.13
Note 1: Thin medium density fiberboard has a maximum thickness of 5/16 inch (8 mm).	

C. Joint Sealants: Comply with CALGreen Section 5.504 and Table 5.504.4.2.

1. Verification of Compliance: Acceptable types are:
 - a. Report of laboratory testing performed in accordance with requirements.
 - b. Published product data showing compliance with requirements.

VOLATILE ORGANIC COMPOUND (VOC) RESTRICTIONS
SECTION 01 6116
3595001

- c. Certification by manufacturer that product complies with requirements.
- 2. Products used shall comply with the following limits.

Table 5.504.4.2 SEALANT VOC LIMIT	
Less Water and Less Exempt Compounds in Grams per Liter	
Sealant	Current VOC Limit
Architectural	250
Marine Deck	760
Non-Membrane Roof	300
Roadway	250
Single-Ply Roof Membrane	450
Other	420
Sealant Primers	Current VOC Limit
Architectural	
Non-Porous	250
Porous	775
Modified Bituminous	500
Marine Deck	760
Other	750
For low-solid adhesives or sealants the VOC limit is expressed in grams per liter of material; for all other adhesives and sealants, VOC limits are expressed as grams of VOC per liter of adhesive or sealant less water and less exempt compounds.	

- D. Paints and Coatings: Comply with CALGreen Section 5.504 and Table 5.504.4.3 based on the California Air Resources Board, Architectural Coatings Suggested Control Measure.
 - 1. Determination of VOC Content: Testing and calculation in accordance with 40 CFR 59, Subpart D (EPA Method 24), exclusive of colorants added to a tint base and water added at Project site; or other method acceptable to authorities having jurisdiction.
 - a. Verification of Compliance: Acceptable types are:
 - 1) Report of laboratory testing performed in accordance with requirements.
 - 2) Published product data showing compliance with requirements.
 - 3) Certification by manufacturer that product complies with requirements.
 - 2. Provide coatings that comply with the most stringent requirements specified in the following:
 - a. 40 CFR 59, Subpart D--National Volatile Organic Compound Emission Standards for Architectural Coatings.
 - b. South Coast Air Quality Management District Rule No.1168.
 - 3. Products used shall comply with the following limits.

VOLATILE ORGANIC COMPOUND (VOC) RESTRICTIONS
SECTION 01 6116
3595001

Table 5.504.4.3 VOC CONTENT LIMITS FOR ARCHITECTURAL COATINGS (See Notes 2 & 3 below)	
Grams of VOC per Liter of Coating, less water and less exempt compounds	
Coating Category	Current VOC Limit 1/1/2012
Flat Coatings	50
Non-Flat Coatings	100
Non-Flat High Gloss Coatings	150
Specialty Coatings	
Aluminum Roof Coatings	400
Basement Specialty Coatings	400
Bituminous Roof Coatings	50
Bituminous Roof Primers	350
Bond Breakers	350
Concrete Curing Compounds	350
Concrete / Masonry Sealers	100
Driveway Sealers	50
Dry Fog Coatings	150
Faux Finishing Coatings	350
Fire Resistive Coatings	350
Floor Coatings	100
Form-Release Compounds	250
Graphic Arts Coatings (Sign Paints)	500
High-Temperature Coatings	420
Industrial Maintenance Coatings	250
Low Solids Coatings (See Note 1 below)	120
Magnesite Cement Coatings	450
Mastic Texture Coatings	100
Metallic Pigmented Coatings	500
Multicolor Coatings	250
Pretreatment Wash Primers	420
Primers, Sealers and Undercoaters	100
Reactive Penetrating Sealers	350
Recycled Coatings	250
Roof Coatings	50
Rust Preventative Coatings	250
Shellacs:	
Clear	730
Opaque	550
Specialty Primers, Sealers and Undercoaters	100
Stains	250
Stone Consolidants	450
Swimming Pool Coatings	340
Traffic Marking Coatings	100
Waterproofing Membranes	250
Wood Coatings	275

VOLATILE ORGANIC COMPOUND (VOC) RESTRICTIONS
SECTION 01 6116
3595001

Table 5.504.4.3 VOC CONTENT LIMITS FOR ARCHITECTURAL COATINGS (See Notes 2 & 3 below)	
Grams of VOC per Liter of Coating, less water and less exempt compounds	
Coating Category	Current VOC Limit 1/1/2012
Wood Preservatives	350
Zinc Rich Primers	340
Note 1: Grams of VOC per liter of coating including water and including exempt compounds	
Note 2: Not Applicable	
Note 3: Values in this table are derived from those specified by the California Air Resources Board, Architectural Coatings Suggested Control Measure, February 1, 2008. More information is available from the Air Resources Board.	

4. Restricted Components: In addition to the specified VOC limits, paints and coatings shall not contain any of the following:
- Acrolein.
 - Acrylonitrile.
 - Antimony.
 - Benzene.
 - Butyl benzyl phthalate.
 - Cadmium.
 - Di (2-ethylhexyl) phthalate.
 - Di-n-butyl phthalate.
 - Di-n-octyl phthalate.
 - 1,2-dichlorobenzene.
 - Diethyl phthalate.
 - Dimethyl phthalate.
 - Ethylbenzene.
 - Formaldehyde.
 - Hexavalent chromium.
 - Isophorone.
 - Lead.
 - Mercury.
 - Methyl ethyl ketone.
 - Methyl isobutyl ketone.
 - Methylene chloride.
 - Naphthalene.
 - Toluene (methylbenzene).
 - 1,1,1-trichloroethane.

- y. Vinyl chloride.

PART 3 - EXECUTION

3.1 FIELD QUALITY CONTROL

- A. Owner reserves the right to reject non-compliant products, whether installed or not, and require their removal and replacement with compliant products at no extra cost to Owner.
- B. Additional costs to restore indoor air quality, including fines by authorities, due to installation of non-compliant products shall be borne by Contractor.

3.2 CERTIFICATION FORM

- A. Use of this Form:
 - 1. Because installers are allowed and directed to choose accessory materials suitable for the applicable installation, there is a possibility that such accessory materials might contain VOC content in excess of that permitted, especially where such materials have not been explicitly specified.
 - 2. Contractor is required to obtain and submit this Form from each installer of work on this project.
 - 3. For each product category listed, circle the correct words in brackets: either [HAS] or [HAS NOT].
 - 4. If these accessory materials have been used, attach to this form product data and MSDS sheet for each such product.

(The Remainder of this Page is Intentionally Left Blank)

VOLATILE ORGANIC COMPOUND (VOC) RESTRICTIONS
SECTION 01 6116
3595001

ACCESSORY MATERIAL VOC CONTENT CERTIFICATION FORM

IDENTIFICATION:

Project Name: _____

Project No.: _____

Architect: _____

PRODUCT CERTIFICATION: I certify that the installation work of my firm on this project:

1. [HAS] [HAS NOT] required the use of any ADHESIVES.
2. [HAS] [HAS NOT] required the use of any JOINT SEALANTS.
3. [HAS] [HAS NOT] required the use of any PAINTS OR COATINGS.
4. [HAS] [HAS NOT] required the use of any COMPOSITE WOOD or AGRIFIBER PRODUCTS.

Product data and MSDS sheets are attached.

CERTIFIED BY (Installer/Manufacturer/Supplier Firm):

Firm Name: _____

Print Name: _____

Signature: _____

Title: _____ (officer of company)

Date: _____

END OF SECTION

*p:\sacramento\3595 tracy unified school district\001-000_villalovoz es new shade structures\08 specifications\06 spec\04
final\ villalovoz\01 6116_volatile organic compound (voc) restrictions.docx
Last Updated: January 18, 2022*

SECTION 01 66 00

PRODUCT DELIVERY, STORAGE AND HANDLING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Site Access, Conditions and Requirements;
- B. Special Conditions.

1.02 PRODUCTS

- A. Products are as defined in the General Conditions.
- B. Contractor shall not use and/or reuse materials and/or equipment removed from existing Premises, except as specifically permitted by the Contract Documents.
- C. Contractor shall provide interchangeable components of the same manufacturer, for similar components.

1.03 TRANSPORTATION AND HANDLING

- A. Contractor shall transport and handle Products in accordance with manufacturer's instructions.
- B. Contractor shall promptly inspect shipments to confirm that Products comply with requirements, quantities are correct, and products are undamaged.
- C. Contractor shall provide equipment and personnel to handle Products by methods to prevent soiling, disfigurement, or damage.

1.04 STORAGE AND PROTECTION

- A. Contractor shall store and protect Products in accordance with manufacturer's instructions, with seals and labels intact and legible. Contractor shall store sensitive products in weather-tight, climate controlled enclosures.
- B. For exterior storage of fabricated Products, Contractor shall place on sloped supports, above ground.
- C. Contractor shall provide off-site storage and protection when Site does not permit on-site storage or protection.

- D. Contractor shall cover products subject to deterioration with impervious sheet covering and provide ventilation to avoid condensation.
- E. Contractor shall store loose granular materials on solid flat surfaces in a well-drained area and prevent mixing with foreign matter.
- F. Contractor shall provide equipment and personnel to store Products by methods to prevent soiling, disfigurement, or damage.
- G. Contractor shall arrange storage of Products to permit access for inspection and periodically inspect to assure Products are undamaged and are maintained under specified conditions.

PART 2 – PRODUCTS Not Used.

PART 3 - EXECUTION Not Used.

END OF DOCUMENT

CUTTING AND PATCHING

PART 1 – GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Inspector, Inspections, and Tests, Integration of Work, Nonconforming Work, and Correction of Work, and Uncovering Work;
- B. Special Conditions;
- C. Imported Materials Certification.

1.02 CUTTING AND PATCHING:

- A. Contractor shall be responsible for all cutting, fitting, and patching, including associated excavation and backfill, required to complete the Work or to:
 - (1) Make several parts fit together properly.
 - (2) Uncover portions of Work to provide for installation of ill-timed Work.
 - (3) Remove and replace defective Work.
 - (4) Remove and replace Work not conforming to requirements of Contract Documents.
 - (5) Remove Samples of installed Work as specified for testing.
 - (6) Provide routine penetrations of non-structural surfaces for installation of piping and electrical conduit.
 - (7) Attaching new materials to existing remodeling areas – including painting (or other finishes) to match existing conditions.
- B. In addition to Contract requirements, upon written instructions from the District, Contractor shall uncover Work to provide for observations of covered Work in accordance with the Contract Documents; remove samples of installed materials for testing as directed by District; and remove Work to provide for alteration of existing Work.
- C. Contractor shall not cut or alter Work, or any part of it, in such a way that endangers or compromises the integrity of the Work, the Project, or work of others.

1.03 SUBMITTALS:

- A. Prior to any cutting or alterations that may affect the structural safety of Project, or work of others, and well in advance of executing such cutting or alterations, Contractor shall submit written notice to District pursuant to the applicable notice provisions of the Contract Documents, requesting consent to proceed with the cutting or alteration, including the following:
 - (1) The work of the District or other trades.
 - (2) Structural value or integrity of any element of Project.
 - (3) Integrity or effectiveness of weather-exposed or weather-resistant elements or systems.
 - (4) Efficiency, operational life, maintenance or safety of operational elements.
 - (5) Visual qualities of sight-exposed elements.
- B. Contractor's Request shall also include:
 - (1) Identification of Project.
 - (2) Description of affected Work.
 - (3) Necessity for cutting, alteration, or excavations.
 - (4) Effects of Work on District, other trades, or structural or weatherproof integrity of Project.
 - (5) Description of proposed Work:
 - (a) Scope of cutting, patching, alteration, or excavation.
 - (b) Trades that will execute Work.
 - (c) Products proposed to be used.
 - (d) Extent of refinishing to be done.
 - (6) Alternates to cutting and patching.
 - (7) Cost proposal, when applicable.
 - (8) The scheduled date the Contractor intends to perform the Work and the duration of time to complete the Work.
 - (9) Written permission of District or other District contractor(s) whose work will be affected.

1.04 QUALITY ASSURANCE:

- A. Contractor shall ensure that cutting, fitting, and patching shall achieve security, strength, weather protection, appearance for aesthetic match, efficiency, operational life, maintenance, safety of operational elements, and the continuity of existing fire ratings.
- B. Contractor shall ensure that cutting, fitting, and patching shall successfully duplicate undisturbed adjacent profiles, materials, textures, finishes, colors, and that materials shall match existing construction. Where there is dispute as to whether duplication is successful or has been achieved to a reasonable degree, the District's decision shall be final.

1.05 PAYMENT FOR COSTS:

- A. Cost caused by ill-timed or defective Work or Work not conforming to Contract Documents, including costs for additional services of the District, its consultants, including but not limited to the Construction Manager, the Architect, the Project Inspector(s), Engineers, and Agents, will be paid by Contractor and/or deducted from the Contract by the District.
- B. District shall only pay for cost of Work if it is part of the original Contract Price or if a change has been made to the contract in compliance with the provisions of the General Conditions. Cost of Work performed upon instructions from the District, other than defective or nonconforming Work, will be paid by District on approval of written Change Order. Contractor shall provide written cost proposals prior to proceeding with cutting and patching.

PART 2 - PRODUCTS

2.01 MATERIALS:

- A. Contractor shall provide for replacement and restoration of Work removed. Contractor shall comply with the Contract Documents and with the Industry Standard(s), for the type of Work, and the Specification requirements for each specific product involved. If not specified, Contractor shall first recommend a product of a manufacturer or appropriate trade association for approval by the District.
- B. Materials to be cut and patched include those damaged by the performance of the Work.

PART 3 – EXECUTION

3.01 INSPECTION:

- A. Contractor shall inspect existing conditions of the Site and the Work, including elements subject to movement or damage during cutting and patching, excavating and backfilling. After uncovering Work, Contractor shall inspect conditions affecting installation of new products.

- B. Contractor shall report unsatisfactory or questionable conditions in writing to District as indicated in the General Conditions and shall proceed with Work as indicated in the General Conditions by District.

3.02 PREPARATION:

- A. Contractor shall provide shoring, bracing and supports as required to maintain structural integrity for all portions of the Project, including all requirements of the Project.
- B. Contractor shall provide devices and methods to protect other portions of Project from damage.
- C. Contractor shall, provide all necessary protection from weather and extremes of temperature and humidity for the Project, including without limitation, any work that may be exposed by cutting and patching Work. Contractor shall keep excavations free from water.

3.03 ERECTION, INSTALLATION AND APPLICATION:

- A. With respect to performance, Contractor shall:
 - (1) Execute fitting and adjustment of products to provide finished installation to comply with and match specified tolerances and finishes.
 - (2) Execute cutting and demolition by methods that will prevent damage to other Work, and provide proper surfaces to receive installation of repairs and new Work.
 - (3) Execute cutting, demolition excavating, and backfilling by methods that will prevent damage to other Work and damage from settlement.
- B. Contractor shall employ original installer or fabricator to perform cutting and patching for:
 - (1) Sight-exposed finished surfaces.
- C. Contractor shall execute fitting and adjustment of products to provide a finished installation to comply with specified products, functions, tolerances, and finishes as shown or specified in the Contract Documents including, without limitation, the Drawings and Specifications.
- D. Contractor shall fit Work airtight to pipes, sleeves, conduit, and other penetrations through surfaces. Contractor shall conform to all Code requirements for penetrations or the Drawings and Specifications, whichever calls for a higher quality or more thorough requirement. Contractor shall maintain integrity of both rated and non-rated fire walls, ceilings, floors, etc.
- E. Contractor shall restore Work which has been cut or removed. Contractor shall install new products to provide completed Work in accordance with requirements of the Contract Documents and as required to match surrounding areas and surfaces.

- F. Contractor shall refinish all continuous surfaces to nearest intersection as necessary to match the existing finish to any new finish.

END OF DOCUMENT

ALTERATION PROJECT PROCEDURES

PART 1 – GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Integration of Work, Purchase of Materials and Equipment, Uncovering of Work and Non-conforming Work and Correction of Work and Trenches;
- B. Special Conditions.

PART 2 - PRODUCTS

2.01 PRODUCTS FOR PATCHING AND EXTENDING WORK:

- A. New Materials: As specified in the Contract Documents including, without limitation, in the Specifications, Contractor shall match existing products, conditions, and work for patching and extending work.
- B. Type and Quality of Existing Products: Contractor shall determine by inspection, by testing products where necessary, by referring to existing conditions and to the Work as a standard.

PART 3 - EXECUTION

3.01 EXAMINATION:

- A. Contractor shall verify that demolition is complete and that areas are ready for installation of new Work.
- B. By beginning restoration Work, Contractor acknowledges and accepts the existing conditions.

3.02 PREPARATION:

- A. Contractor shall cut, move, or remove items as necessary for access to alterations and renovation Work. Contractor shall replace and restore these at completion.
- B. Contractor shall remove unsuitable material not as salvage unless otherwise indicated in the Contract Documents. Unsuitable material may include, without limitation, rotted wood, corroded metals, and deteriorated masonry and concrete. Contractor shall replace materials as specified for finished Work.

- C. Contractor shall remove debris and abandoned items from all areas of the Site and from concealed spaces.
- D. Contractor shall prepare surface and remove surface finishes to provide for proper installation of new Work and finishes.

3.03 INSTALLATION:

- A. Contractor shall coordinate Work of all alternations and renovations to expedite completion and to accommodate District occupancy.
- B. Designated Areas and Finishes: Contractor shall complete all installations in all respects, including operational, and electrical work.
- C. Contractor shall remove, cut, and patch Work in a manner to minimize damage and to provide a means of restoring Products and finishes to original or specified condition.
- D. Contractor shall refinish visible existing surfaces to remain to specified condition for each material, with a neat and square or straight transition to adjacent finishes.
- E. Contractor shall install products as specified in the Contract Documents, including without limitation, the Specifications.

3.04 TRANSITIONS:

- A. Where new Work abuts or aligns with existing, Contractor shall perform a smooth and even transition. Patched Work must match existing adjacent work in texture and appearance.
- B. When finished surfaces are cut so that a smooth transition with new Work is not possible, Contractor shall terminate existing surface along a straight line at a natural line of division and make a recommendation for resolution to the District and the Architect for review and approval.

3.05 ADJUSTMENTS:

- A. Where a change of plane of 1/4 inch or more occurs, Contractor shall submit a recommendation for providing a smooth transition to the District and the Architect for review and approval.
- B. Contractor shall fit Work at penetrations of surfaces.

3.06 REPAIR OF DAMAGED SURFACES:

- A. Contractor shall patch or replace portions of existing surfaces, which are damaged, lifted, discolored, or showing other imperfections, in the area where the Work is performed.
- B. Contractor shall repair substrate prior to patching finish.

3.07 CULTIVATED AREAS AND OTHER SURFACE IMPROVEMENTS:

- A. Cultivated or planted areas and other surface improvements which are damaged by actions of the Contractor shall be restored by Contractor to their original condition or better, where indicated.
- B. Contractor shall protect and replace, if damaged, all existing guard posts, barricades, and fences.
- C. Contractor shall give special attention to avoid damaging or killing trees, bushes and/or shrubs on the Premises and/or identified in the Contract Documents, including without limitation, the Drawings.

3.08 FINISHES:

- A. Contractor shall finish surfaces as specified in the Contract Documents, including without limitations, the provisions of all Divisions of the Specifications.
- B. Contractor shall finish patches to produce uniform finish and texture over entire area. When finish cannot be matched, Contractor shall refinish entire surface to nearest intersections.

3.09 CLEANING:

- A. Contractor shall continually clean the Site and the Premises as indicated in the Contract Documents, including without limitation, the provisions in the General Conditions and the Specifications regarding cleaning.

END OF DOCUMENT

CONTRACT CLOSEOUT AND FINAL CLEANING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Completion of Work;
- B. Special Conditions;
- C. Temporary Facilities and Controls.

1.02 CLOSEOUT PROCEDURES

Contractor shall comply with all closeout provisions as indicated in the General Conditions.

1.03 FINAL CLEANING

- A. Contractor shall execute final cleaning prior to final inspection.
- B. Contractor shall clean interior and exterior glass and all surfaces exposed to view; remove temporary labels, tape, stains, and foreign substances, polish transparent and glossy surfaces, wax and polish new vinyl floor surfaces, vacuum carpeted and soft surfaces.
- C. Contractor shall clean equipment and fixtures to a sanitary condition.
- D. Contractor shall replace filters of operating equipment.
- E. Contractor shall clean debris from roofs, gutters, down spouts, and drainage systems.
- F. Contractor shall clean Site, sweep paved areas, and rake clean landscaped surfaces.
- G. Contractor shall remove waste and surplus materials, rubbish, and construction facilities from the Site and surrounding areas.

1.04 ADJUSTING

Contractor shall adjust operating products and equipment to ensure smooth and unhindered operation.

1.05 RECORD DOCUMENTS AND SHOP DRAWINGS

- A. Contractor shall legibly mark each item to record actual construction, including:
 - (1) Measured depths of foundation in relation to finish floor datum.
 - (2) Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permit surface improvements.
 - (3) Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.
 - (4) Field changes of dimension and detail.
 - (5) Details not on original Contract Drawings
 - (6) Changes made by modification(s).
 - (7) References to related Shop Drawings and modifications.
- B. Contractor will provide one set of Record Drawings to District.
- C. Contractor shall submit all required documents to District and/or Architect prior to or with its final Application for Payment.

1.06 INSTRUCTION OF DISTRICT PERSONNEL

- A. Before final inspection, at agreed upon times, Contractor shall instruct District's designated personnel in operation, adjustment, and maintenance of products, equipment, and systems.
- B. For equipment requiring seasonal operation, Contractor shall perform instructions for other seasons within six months or by the change of season.
- C. Contractor shall use operation and maintenance manuals as basis for instruction. Contractor shall review contents of manual with personnel in detail to explain all aspects of operation and maintenance.
- D. Contractor shall prepare and insert additional data in Operation and Maintenance Manual when the need for such data becomes apparent during instruction.
- E. Contractor shall review contents of manual with personnel in detail to explain all aspects of operation and maintenance.

1.07 SPARE PARTS AND MAINTENANCE MATERIALS

- A. Contractor shall provide products, spare parts, maintenance, and extra materials in quantities specified in the Specifications and in Manufacturer's recommendations.

- B. Contractor shall provide District with all required Operation and Maintenance Data at one time. Partial or piecemeal submissions of Operation and Maintenance Data will not be accepted.

PART 2 – PRODUCTS Not Used.

PART 3 – EXECUTION Not Used.

END OF DOCUMENT

OPERATION AND MAINTENANCE DATA

PART 1 – GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Completion of the Work;
- B. Special Conditions.

1.02 QUALITY ASSURANCE:

Contractor shall prepare instructions and data by personnel experienced in maintenance and operation of described products.

1.03 FORMAT:

- A. Contractor shall prepare data in the form of an instructional manual entitled "OPERATIONS AND MAINTENANCE MANUAL & INSTRUCTIONS" ("Manual").
- B. Binders: Contractor shall use commercial quality, 8-1/2 by 11 inch, three-side rings, with durable plastic covers; two inch maximum ring size. When multiple binders are used, Contractor shall correlate data into related consistent groupings.
- C. Cover: Contractor shall identify each binder with typed or printed title "OPERATION AND MAINTENANCE MANUAL & INSTRUCTIONS"; and shall list title of Project and identify subject matter of contents.
- D. Contractor shall arrange content by systems process flow under section numbers and sequence of Table of Contents of the Contract Documents.
- E. Contractor shall provide tabbed fly leaf for each separate product and system, with typed description of product and major component parts of equipment.
- F. Text: The content shall include Manufacturer's printed data, or typewritten data on 24 pound paper.
- G. Drawings: Contractor shall provide with reinforced punched binder tab and shall bind in with text; folding larger drawings to size of text pages.

1.04 CONTENTS, EACH VOLUME:

- A. Table of Contents: Contractor shall provide title of Project; names, addresses, and telephone numbers of the Architect, any engineers, subconsultants, Subcontractor(s), and Contractor with name of responsible parties; and schedule of products and systems, indexed to content of the volume.

- B. For Each Product or System: Contractor shall list names, addresses, and telephone numbers of Subcontractor(s) and suppliers, including local source of supplies and replacement parts.
- C. Product Data: Contractor shall mark each sheet to clearly identify specific products and component parts, and data applicable to installation. Delete inapplicable information.
- D. Drawings: Contractor shall supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams. Contractor shall not use Project Record Documents as maintenance drawings.
- E. Text: Contractor shall include any and all information as required to supplement product data. Contractor shall provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions.
- F. Warranties and Bonds: Contractor shall bind in one copy of each.

1.05 MANUAL FOR MATERIALS AND FINISHES:

- A. Building Products, Applied Materials, and Finishes: Contractor shall include product data, with catalog number, size, composition, and color and texture designations. Contractor shall provide information for re-ordering custom manufactured products.
- B. Instructions for Care and Maintenance: Contractor shall include Manufacturer's recommendations for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.
- C. Moisture Protection and Weather Exposed Products: Contractor shall include product data listing applicable reference standards, chemical composition, and details of installation. Contractor shall provide recommendations for inspections, maintenance, and repair.
- D. Additional Requirements: Contractor shall include all additional requirements as specified in the Specifications.
- E. Contractor shall provide a listing in Table of Contents for design data, with tabbed fly sheet and space for insertion of data.

1.06 MANUAL FOR EQUIPMENT AND SYSTEMS:

- A. Each Item of Equipment and Each System: Contractor shall include description of unit or system, and component parts and identify function, normal operating characteristics, and limiting conditions. Contractor shall include performance curves, with engineering data and tests, and complete nomenclature, and commercial number of replaceable parts.
- B. Panelboard Circuit Directories: Contractor shall provide electrical service characteristics, controls, and communications.

- C. Contractor shall include color coded wiring diagrams as installed.
- D. Operating Procedures: Contractor shall include start-up, break-in, and routine normal operating instructions and sequences. Contractor shall include regulation, control, stopping, shut-down, and emergency instructions. Contractor shall include summer, winter, and any special operating instructions.
- E. Maintenance Requirements: Contractor shall include routine procedures and guide for trouble-shooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.
- F. Contractor shall provide servicing and lubrication schedule, and list of lubricants required.
- G. Contractor shall include manufacturer's printed operation and maintenance instructions.
- H. Contractor shall include sequence of operation by controls manufacturer.
- I. Contractor shall provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.
- J. Contractor shall provide control diagrams by controls manufacturer as installed.
- K. Contractor shall provide Contractor's coordination drawings, with color coded piping diagrams as installed.
- L. Contractor shall provide charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams.
- M. Contractor shall provide list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.
- N. Additional Requirements: Contractor shall include all additional requirements as specified in Specification(s).
- O. Contractor shall provide a listing in Table of Contents for design data, with tabbed fly sheet and space for insertion of data.

1.07 SUBMITTAL:

- A. Contractor shall submit to the District for review two (2) copies of preliminary draft or proposed formats and outlines of the contents of the Manual within thirty (30) days of Contractor's start of Work.
- B. For equipment, or component parts of equipment put into service during construction and to be operated by District, Contractor shall submit draft content for that portion of the Manual within ten (10) days after acceptance of that equipment or component.

- C. Contractor shall submit two (2) copies of a complete Manual in final form prior to final Application for Payment. Copy will be returned with Architect/Engineer comments. Contractor must revise the content of the Manual as required by District prior to District's approval of Contractor's final Application for Payment.
- D. Contractor must submit two (2) copies of revised Manual in final form within ten (10) days after final inspection.

PART 2 – PRODUCTS Not Used.

PART 3 – EXECUTION Not Used.

END OF DOCUMENT

WARRANTIES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Warranty/Guarantee Information;
- B. Special Conditions.

1.02 FORMAT

- A. Binders: Contractor shall use commercial quality, 8-1/2 by 11 inch, three-side rings, with durable plastic covers; two inch maximum ring size.
- B. Cover: Contractor shall identify each binder with typed or printed title "WARRANTIES" and shall list title of Project.
- C. Table of Contents: Contractor shall provide title of Project; name, address, and telephone number of Contractor and equipment supplier; and name of responsible principal. Contractor shall identify each item with the number and title of the specific Specification, document, provision, or section in which the name of the product or work item is specified.
- D. Contractor shall separate each warranty with index tab sheets keyed to the Table of Contents listing, providing full information and using separate typed sheets as necessary. Contractor shall list each applicable and/or responsible Subcontractor(s), supplier(s), and/or manufacturer(s), with name, address, and telephone number of each responsible principal(s).

1.03 PREPARATION:

- A. Contractor shall obtain warranties, executed in duplicate by each applicable and/or responsible subcontractor(s), supplier(s), and manufacturer(s), within ten (10) days after completion of the applicable item or work. Except for items put into use with District's permission, Contractor shall leave date of beginning of time of warranty blank until the date of completion is determined.
- B. Contractor shall verify that documents are in proper form, contain full information, and are notarized, when required.
- C. Contractor shall co-execute submittals when required.
- D. Contractor shall retain warranties until time specified for submittal.

1.04 TIME OF SUBMITTALS:

- A. For equipment or component parts of equipment put into service during construction with District's permission, Contractor shall submit a draft warranty for that equipment or component within ten (10) days after acceptance of that equipment or component.
- B. Contractor shall submit for District approval all warranties and related documents within ten (10) days after date of completion. Contractor must revise the warranties as required by the District prior to District's approval of Contractor's final Application for Payment.
- C. For items of work delayed beyond date of completion, Contractor shall provide an updated submittal within ten (10) days after acceptance, listing the date of acceptance as start of warranty period.

PART 2 - PRODUCTS Not Used.

PART 3 – EXECUTION Not Used.

END OF DOCUMENT

(Letterhead of Contractor)

STANDARD GUARANTEE / WARRANTY

for

Project Name

Contract No.

We hereby warrant that the Work we have provided under the above reference Contract has been completed in accordance with the Drawings, Specifications, and other Contract Documents.

Under the terms of this warranty, we agree to repair or replace any or all of our work, together with any other adjacent work which may be displaced or damaged by so doing, which may prove to be either patently defective in its workmanship or latently defective in its workmanship or materials within the period of 24 months from the date of filing of the Notice of Completion of the above named Project by the Board of Trustees of the School District, and we also agree to repair any and all damages resulting from such defects, without any expense whatsoever to said Board of Trustees, ordinary wear and tear and unusual abuse or neglect excepted.

In the event of our failure to comply with above-mentioned guarantee conditions within ten (10) day after being notified in writing by the Owner, we collectively and separately do hereby authorize the Owner to have said defective work and damages repaired or replaced and made good at our expense and will honor and pay the costs and charges therefore upon demand.

SIGNED (Contractor) _____

(Address)

(Printed Name of Authorized Representative)

Signature

(License Number)

(Date of Signing)

COUNTERSIGNED (Owner) _____

(Printed Name of Authorized Representative)

Signature

Date of Filing or Notice of Completion: _____

(Letterhead of Company)

SUBCONTRACTOR STANDARD GUARANTEE / WARRANTY

We hereby warrant that

which we have provided in _____

Name of Project _____

for

District

has been completed in accordance with Specification Section _____ and requirements of the Contract Documents.

Under the terms of this warranty, we agree to repair or replace any or all of our work, together with any other adjacent work which may be displaced or damaged by so doing, which may prove to be either patently defective in its workmanship or latently defective in its workmanship or materials within a period of 24 months from date of filing the Notice of Completion of the above-named Project by the Board of Trustees of the School District without any expense whatsoever to said Board of Trustees, ordinary wear and tear and unusual abuse or neglect excepted.

In the event of our failure to comply with above-mentioned guarantee conditions within ten (10) day after being notified in writing by the Owner, we collectively and separately do hereby authorize the Owner to have said defective work and damages repaired or replaced and made good at our expense and will honor and pay the costs and charges therefore upon demand.

SIGNED (Subcontractor)

(Signature)

(Company Name)

(Address)

(License Number)

(Date of Signing)

(License Number)

(Date of Signing)

COUNTERSIGNED (General Contractor)

(Signature)

(Company Name)

(Address)

(License Number) (Date of Signing)

(License Number) (Date of Signing)

(Letterhead of Company)

SPECIAL EXTENDED WRITTEN GUARANTEE / WARRANTY

We hereby warrant that

which we have provided in _____

Name of Project

for _____

District

has been completed in accordance with Specification Section _____ and requirements of the Contract Documents.

Under the terms of this warranty, we agree to repair or replace any or all of our work, together with any other adjacent work which may be displaced or damaged by so doing, which may prove to be either patently defective in its workmanship or latently defective in its workmanship or materials within a period of _____ year(s) from date of filing the Notice of Completion of the above-named Project by the Board of Trustees of the School District without any expense whatsoever to said Board of Trustees, ordinary wear and tear and unusual abuse or neglect excepted. We also agree to repair any and all damages resulting from such defects.

In the event of our failure to comply with above-mentioned conditions within a reasonable time but in no case longer than ten (10) calendar days after being notified in writing by the Owner, we collectively and separately do hereby authorize the Owner to have said defective work and damages repaired or replaced and made good at our expense and will honor and pay the costs and charges therefore upon demand.

SIGNED (Subcontractor)

(Name)

(Address)

(License Number)

(Date of Signing)

COUNTERSIGNED (General Contractor)

(Name)

(Address)

(License Number)

(Date of Signing)

RECORD DOCUMENTS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Documents on Work;
- B. Special Conditions.

PART 2 - RECORD DRAWINGS

2.01 GENERAL:

- A. As indicated in the Contract Documents, the District will provide Contractor with one set of reproducible, full size original Contract Drawings (mylars).
- B. Contractor shall maintain at each Project Site one set of marked-up plans and shall transfer all changes and information to those marked-up plans, as often as required in the Contract Documents, but in no case less than once each month. Contractor shall submit to the Project Inspector one set of reproducible vellums of the Project Record Drawings ("As-Built") showing all changes incorporated into the Work since the preceding monthly submittal. The As-Built shall be available at the Project Site. The Contractor shall submit reproducible vellums at the conclusion of the Project following review of the blue line prints.
- C. Label and date each Record Drawing "RECORD DOCUMENT" in legibly printed letters.
- D. All deviations in construction, including but not limited to pipe and conduit locations and deviations caused by without limitation Change Orders, Construction Claim Directives, RFI's, and Addenda, shall be accurately and legibly recorded by Contractor.
- E. Locations and changes shall be done by Contractor in a neat and legible manner and, where applicable, indicated by drawing a "cloud" around the changed or additional information.

2.02 RECORD DRAWING INFORMATION:

- A. Contractor shall record the following information:
 - (1) Locations of Work buried under or outside each building, including, without limitation, all utilities, plumbing and electrical lines, and conduits.

- (2) Actual numbering of each electrical circuit to match panel schedule.
- (3) Locations of significant Work concealed inside each building whose general locations are changed from those shown on the Contract Drawings.
- (4) Locations of all items, not necessarily concealed, which vary from the Contract Documents.
- (5) Installed location of all cathodic protection anodes.
- (6) Deviations from the sizes, locations, and other features of installations shown in the Contract Documents.
- (7) Locations of underground work, points of connection with existing utilities, changes in direction, valves, manholes, catch basins, capped stubouts, invert elevations, etc.
- (8) Sufficient information to locate Work concealed in each building with reasonable ease and accuracy.

In some instances, this information may be recorded by dimension. In other instances, it may be recorded in relation to the spaces in the building near which it was installed.

- B. Contractor shall provide additional drawings as necessary for clarification.
- C. Contractor shall provide reproducible record drawings, made from final Shop Drawings marked "No Exceptions Taken" or "Approved as Noted."
- D. After review and approval of the marked-up specifications by the Project Inspector, Contractor shall provide electronic copies of the drawings (in PDF format) with one file with all of the sheets and one set of individual sheet files at the conclusion of the Project.

PART 3 - RECORD SPECIFICATIONS

3.01 GENERAL:

- A. Contractor shall mark each section legibly to record manufacturer, trade name, catalog number, and supplier of each Product and item of equipment actually installed.
- B. After review and approval of the marked-up specifications by the Project Inspector, Contractor shall provide one electronic copy of the specifications (in PDF format) at the conclusion of the Project.

PART 4 - MAINTENANCE OF RECORD DOCUMENTS

4.01 GENERAL

- A. Contractor shall store Record Documents apart from documents used for construction as follows:

- (1) Provide files and racks for storage of Record Documents.
- (2) Maintain Record Documents in a clean, dry, legible condition and in good order.

B. Contractor shall not use Record Documents for construction purposes.

PART 5 – PRODUCTS Not Used.

END OF DOCUMENT

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes general requirements and procedures for compliance with California Code of Regulations, Title 24, Part 11 California Green Building Standards Code, "CAL-Green".

- 1. Chapter 5- Non-Residential Mandatory Measures.

1.2 RELATED REQUIREMENTS

- A. Pertinent sections specifying erosion control.
- B. Section 01 6116, Volatile Organic Compound (VOC) Restrictions.
- C. Document 01 5013, Construction Waste Management and Disposal.
- D. Document 01 7700, Contract Closeout and Final Cleaning.

1.3 DEFINITIONS

- A. CAL-Green Definitions: Certain terms are defined by CAL-Green in Chapter 5 of the code. Words and terms used in this section shall have the meanings shown therein.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Respond to questions and requests from Architect and the jurisdiction having authority regarding CAL-Green credits that are the responsibility of the Contractor, that depend on product selection or product qualities, or that depend on Contractor's procedures. Document responses as informational submittals.

1.5 SUBMITTALS

- A. CAL-GREEN Submittals: Submit CAL-GREEN submittals required by code and in other Specification Sections.
 - 1. CAL-GREEN submittals are in addition to other submittals. If submitted item is identical to that submitted to comply with other requirements, submit duplicate copies as a separate submittal to verify compliance with indicated CAL-GREEN requirements.
 - 2. Acceptable verification submittals are specified in the related sections.

SUSTAINABLE DESIGN REQUIREMENTS
SECTION 01 8113
3595001

PART 2 - PRODUCTS

2.1 REQUIREMENTS - GENERAL

- A. Provide products and procedures necessary to confirm CAL-GREEN compliance required in this Section. Although other Sections may specify some CAL-GREEN requirements, the Contractor shall determine additional materials, techniques, means, methods and procedures necessary to comply with CAL-GREEN requirements.

2.2 STORM WATER POLLUTION PREVENTION PLAN

- A. Section 5.106.1: Comply with requirements of this code section, local ordinances, General Conditions, Special Provisions, and related sections specifying erosion control.

2.3 OUTDOOR WATER USE

- A. Section 5.304.3.1: Irrigation Controllers: Comply with requirements of this code section, local ordinances and Section 32 8000.

2.4 CONSTRUCTION WASTE REDUCTION

- A. Section 5.408 Construction Waste Management, Diversion and Recycling: Comply with requirements of this code section, local ordinances and Section 01 7419.

2.5 BUILDING MAINTENANCE AND OPERATION

- A. Section 5.410.2.3, 4. Commissioning and Functional Performance Testing: Participate in Commissioning and provide functional performance testing as required by these code sections and as specified in Section 01 9113.
- B. Section 5.410.2.5. Documentation and Training: Provide Operations Training as required by these code sections and as specified in Section 01 7700 and Systems Manual as specified in Section 01 7700.

2.6 POLLUTANT CONTROL

- A. Section 5.504.3 Indoor Air Quality: Comply with requirements of this code section, local ordinances.
- B. Section 5.504.4 Finish Material Pollutant Control: All Finish materials shall comply with requirements of this code section, local ordinances and Section 01 6116.

PART 3 - EXECUTION

3.1 GENERAL

- A. Comply with Document 01 5013, Construction Waste Management and Disposal.

SUSTAINABLE DESIGN REQUIREMENTS
SECTION 01 8113
3595001

- B. Comply with execution requirements of related sections and applicable local codes and ordinances.

END OF SECTION

*p:\sacramento\3595 tracy unified school district\001-000_villalovoz es new shade structures\08 specifications\06 spec\04
final\villalovoz\01 8113.10_sustainable design requirements (cal-green).docx
Last Updated: April 8, 2019*

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Sealants and backing for interior and exterior joints.

1.2 RELATED REQUIREMENTS

- A. Section 01 6116, Volatile Organic Compound (VOC) Restrictions, for VOC limits pertaining to adhesives, sealants, fillers, primers, and coatings.
- B. Section 01 8113, Sustainable Design Requirements, for CAL-Green general requirements and procedures.
- C. Pertinent Sections specifying sealants or referencing this Section for sealant products and installation requirements.
- D. Section 07 8413, Penetration Firestopping, for sealing joints in fire-resistance-rated construction.

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on Drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CAL Green), edition as noted on Drawings, as adopted by the California Division of the State Architect (DSA).
- C. American Concrete Institute (ACI) Publications and Standards:
 - 1. ACI 302.1R: Guide to Concrete Floor and Slab Construction.
 - 2. ACI 360R-10: Guide to Design of Slabs-on-Ground.
- D. ASTM International (ASTM):
 - 1. C834: Standard Specification for Latex Sealants.
 - 2. C919: Standard Practice for Use of Sealants in Acoustical Applications.
 - 3. C920: Standard Specification for Elastomeric Joint Sealants.
 - 4. C1193: Standard Guide for Use of Joint Sealants.
 - 5. C1247: Standard Test Method for Durability of Sealants Exposed to Continuous Immersion in Liquids.
 - 6. C1248: Standard Test Method for Staining of Porous Substrate by Joint Sealants.
 - 7. C1311: Standard Specification for Solvent Release Sealants.
 - 8. C1330: Standard Specification for Cylindrical Sealant Backing for Use with Cold Liquid-Applied Sealants.

JOINT SEALANTS
SECTION 07 9200
3595001

9. C1521: Standard Practice for Evaluating Adhesion of Installed Weatherproofing Sealant Joints.
 10. D1667: Standard Specification for Flexible Cellular Materials - Poly (Vinyl Chloride) Foam (Closed-Cell).
 11. E90: Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements.
- E. Federal Specifications (FS):
1. FS TT-S-001657: Sealing Compound--Single Component, Butyl Rubber Based, Solvent Release Type.
- F. South Coast Air Quality Management District (SCAQMD):
1. Rule 1168: Adhesive and Sealant Applications.
- G. U.S. Food & Drug Administration (FDA):
1. Code of Federal Regulations: Title 21, 21 CFR 177.2600, Rubber Articles Intended for Repeated Use.

1.4 DEFINITIONS

- A. Sealant Terminology in accordance with ASTM C834 and ASTM C920:
1. Type C: Clear / translucent sealant.
 2. Type OP: Opaque pigmented sealant.
 3. Type S: Single component sealant.
 4. Type M: Sealant with two or more components.
 5. Grade NS: Nonsag sealant.
 6. Grade P: Pourable sealant.
 7. Grade -18°C: Sealant with low temperature flexibility tested to -18°C (0°F).
 8. Grade 0°C: Sealant with low temperature flexibility tested to 0°C (32°F).
 9. Grade NF: Sealant does not meet low temperature flexibility requirements.
 10. Class 12-1/2: Sealant capable of handling movement, either contraction or expansion, of 12.5 percent of the original joint width.
 11. Class 25: Sealant capable of handling movement, either contraction or expansion, of 25 percent of the original joint width.
 12. Class 35: Sealant capable of handling movement, either contraction or expansion, of 35 percent of the original joint width.
 13. Class 50: Sealant capable of handling movement, either contraction or expansion, of 50 percent of the original joint width.
 14. Class 100 / 50: Sealant capable of handling movement of 50 percent contraction and 100 percent expansion.
 15. Use Related to Exposure:
 - a. Use NT: Nontraffic.
 - b. Use T: Traffic.
 - c. Use I: Immersible.

16. Use Related to Material:
 - a. Use A: Sealant used in contact with aluminum.
 - b. Use G: Sealant used in contact with glass.
 - c. Use M: Sealant used in contact with mortar.
 - d. Use O: Sealants used in contact with all other materials other than those previously listed.

1.5 ADMINISTRATIVE REQUIREMENTS

- A. Submittal Procedures:
 1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
 2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
 3. Sustainable Design Submittals shall comply with the additional requirement of Section 01 8113, Sustainable Design Requirements.
- B. Pre-Installation Meeting: Conduct at Project site. Review joint application procedures, compatibility tests, adhesion tests, and warranty requirements in a meeting involving Architect, Project Inspector, installer, manufacturer or manufacturer's representative.
- C. Coordination:
 1. Use of different manufacturer's sealant types for application at exterior wall and glazing systems is not permitted. It is required that a single source for silicone sealants be used on this Project. The Contractor is responsible for coordinating compliance with this requirement where installation of sealants is delegated to various Subcontractors installing the exterior envelope systems for the Project.
 2. Contractor shall coordinate and be responsible for compatibility and performance between sealants and other materials, and related Sections using sealants which may be in direct contact with work of this Section or adjacent to the other. Isolate and prevent of incompatibility between sealants in accordance with manufacturer's specifications, recommendations and instructions.

1.6 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated, demonstrate compliance with specified attributes.
 1. Include color chart from manufacturers for each joint sealant product required.
 2. Provide certification by joint sealant manufacturer that materials provided for this Section are 100 percent asbestos-free.
- B. Samples for initial Selection: In form of manufacturer's standard bead samples, consisting of strips of actual products showing full range of colors available, for each product exposed to view.

JOINT SEALANTS

SECTION 07 9200

3595001

- C. Samples for Verification: For each kind and color of joint sealant required, provide Samples with joint sealants in 1/2 inch wide joints formed between two 6 inch long strips of material matching the appearance of exposed surfaces adjacent to joint sealants.
- D. Joint-Sealant Schedule: Include the following information.
 - 1. Joint-sealant application, joint location, and designation.
 - 2. Joint-sealant manufacturer and product name.
 - 3. Joint-sealant formulation.
 - 4. Joint-sealant colors (multiple colors will be required).

1.7 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.
- B. Product Certificates: For each kind of joint sealant and accessory, from manufacturer.
- C. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, indicating that sealants comply with requirements.
 - 1. Preconstruction Compatibility and Adhesion Test Reports from sealant manufacturer, indicating the following:
 - a. Materials forming joint substrates and joint-sealant backings have been tested for compatibility and adhesion with joint sealants.
 - b. Interpretation of test results and written recommendations for primers and substrate preparation needed for adhesion.
 - 2. Preconstruction Field-Adhesion Test Reports: Indicate which sealants and joint preparation methods resulted in optimum adhesion to joint substrates based on testing specified in this Section.
- D. Sustainable Design:
 - 1. General:
 - a. Submit information necessary to establish and document compliance with the California Green Building Standards Code.
 - b. Sustainable design submittals are in addition to other submittals.
 - 2. The following information shall be provided:
 - a. Adhesives and Sealants: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.
- E. Sample of manufacturer's warranty.
- F. Record of Pre-Installation Meeting.

1.8 CLOSEOUT SUBMITTALS

- A. Warranty and Guarantee: Submit executed warranty and extended Contractor guarantee.

1.9 QUALITY ASSURANCE

- A. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for installation of sealants and backing required for this Project.
- B. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.
- C. Single Source Responsibility: Obtain each kind of joint sealant from single source from single manufacturer.
- D. Materials, components, assemblies, workmanship and installation are to be observed by the Project Inspector. Work not so inspected is subject to uncovering and replacement.
- E. Mockups: Install sealant in mockups of assemblies specified in other Sections that are indicated to receive joint sealants specified in this Section. Use materials and installation methods specified in this Section.

1.10 PRECONSTRUCTION TESTING

- A. Preconstruction Testing is not required if joint-sealant manufacturers submit joint preparation data that are based on previous testing, not older than 24 months, of sealant products for adhesion to, and compatibility with, joint substrates and other materials matching those submitted.
- B. Preconstruction Compatibility and Adhesion Testing: Submit to sealant manufacturers, for testing indicated below, samples of materials that will contact or affect joint sealants.
 - 1. Use manufacturer's standard test method to determine whether priming and other specific joint preparation techniques are required to obtain rapid, optimum adhesion of joint sealants to joint substrates.
 - 2. Submit not fewer than eight pieces of each kind of material, including joint substrates, shims, joint-sealant backings, secondary seals, and miscellaneous materials.
 - 3. Schedule sufficient time for testing and analyzing results to prevent delaying the Work.
 - 4. For materials failing tests, obtain joint-sealant manufacturer's written instructions for corrective measures including use of specially formulated primers.
- C. Preconstruction Field-Adhesion Testing: Before installing sealants, field test their adhesion to Project joint substrates as follows:
 - 1. Locate test joints where indicated on Project or, if not indicated, as directed by Architect.
 - 2. Conduct field tests for each kind of sealant and joint substrate indicated.
 - 3. Notify Architect seven days in advance of dates and times when test joints will be erected.
 - 4. Arrange for tests to take place with joint-sealant manufacturer's technical representative present.

JOINT SEALANTS
SECTION 07 9200
3595001

5. Test Method: Test joint sealants according to Method A, Field-Applied Sealant Joint Hand Pull Tab, in Appendix X1 in ASTM C 1193 or Method A, Tail Procedure, in ASTM C 1521.
 - a. For joints with dissimilar substrates, verify adhesion to each substrate separately; extend cut along one side, verifying adhesion to opposite side. Repeat procedure for opposite side.
6. Report whether sealant failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each kind of product and joint substrate. For sealants that fail adhesively, retest until satisfactory adhesion is obtained.
7. Evaluation of Preconstruction Field-Adhesion-Test Results: Sealants not evidencing adhesive failure from testing, in absence of other indications of noncompliance with requirements, will be considered satisfactory. Do not use sealants that fail to adhere to joint substrates during testing.

1.11 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials to project site in original factory wrappings and containers, labeled with identification of manufacturer, product name and designation, color, expiration period for use, pot life, curing time, and mixing instructions for multicomponent materials.
- B. Store and handle materials in compliance with manufacturer's recommendations to prevent their deterioration or damage due to moisture, high or low temperatures, contaminants, or other causes.

1.12 FIELD CONDITIONS

- A. Environmental Conditions: Do not proceed with installation of joint sealants under the following conditions:
 1. When ambient and substrate temperature conditions are outside the limits permitted by joint sealant manufacturer.
 2. When joint substrates are wet.
- B. Joint Width Conditions: Do not proceed with installation of joint sealants where joint widths are less than allowed by joint sealant manufacturer for application indicated.
- C. Joint Substrate Conditions: Do not proceed with installation of joint sealants until contaminants capable of interfering with their adhesion are removed from joint substrates.

1.13 WARRANTY AND GUARANTEE

- A. Manufacturer: In addition to the Contractor's and Subcontractor's Standard Guarantee, furnish Owner with manufacturer's fully executed written warranty for sealant against defects in materials and workmanship for a period of 5 years:
- B. Contractor: in addition to its standard Guarantee under the Contract, furnish Owner a special extended written five-year guarantee, cosigned by installer, for sealant, agreeing to replace any and all joints that leaks or otherwise fails to perform as required within guarantee period as a result of failure of materials or installation workmanship at no additional cost to the Owner.

PART 2 - PRODUCTS

2.1 DESIGN AND PERFORMANCE CRITERIA

- A. Sustainable Design:
 - 1. VOC emissions for field-applied adhesives, sealants, and sealant primers must comply with limits specified in Section 01 6116.
- B. Building Envelope: Make watertight and weatherproof.
 - 1. Exterior work that does not remain watertight and all work which does not retain all properties inherent in the product as stipulated by the manufacturer will be considered faulty.
- C. Provide elastomeric joint sealants that have been produced and installed to establish and to maintain watertight and airtight continuous seals without causing staining or deterioration of joint substrates.
- D. Provide joint sealants for interior applications that have been produced and installed to establish and maintain airtight continuous seals that are water resistant and cause no staining or deterioration of joint substrates.
- E. Design Requirements:
 - 1. Seal building joints with non-sag type sealant.
 - 2. Seal floor joints with self-leveling or slope grade self-leveling type sealant.

2.2 MATERIALS, GENERAL

- A. Compatibility: Provide joint sealants, joint fillers, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by sealant manufacturer based on testing and field experience.
- B. Liquid-Applied Joint Sealants: Comply with ASTM C920 and other requirements indicated for each liquid-applied joint sealant specified, including those referencing ASTM C920 classifications for type, grade, class, and uses related to exposure and joint substrates.
 - 1. Suitability for Immersion in Liquids. Where sealants are indicated for Use I for joints that will be continuously immersed in liquids, provide products that have undergone testing according to ASTM C 1247. Liquid used for testing sealants is deionized water, unless otherwise indicated.
- C. Stain-Test-Response Characteristics: Where sealants are specified to be non-staining to porous substrates, provide products that have undergone testing according to ASTM C 1248 and have not stained porous joint substrates indicated for Project.
- D. Suitability for Contact with Food: Where sealants are indicated for joints that will come in repeated contact with food, provide products that comply with 21 CFR 177.2600.

JOINT SEALANTS
SECTION 07 9200
3595001

E. Colors:

1. General:
 - a. Architect will provide color selections and locations for each sealant type and for Contractor's use.
 - b. Not all locations will have the same color.
 - c. Custom colors **[will] [may]** be required.
2. Provide color of exposed joint sealants to comply with the following:
 - a. Provide colors matching selections made by Architect from manufacturer's full range of colors for products of type indicated.
 - b. Request color selection for exposed products listed without a preselected color.

2.3 SILICONE JOINT SEALANTS

- A. Single-Component, Nonsag, Neutral-Curing Silicone Joint Sealant: ASTM C920, Type S, Grade NS, Class 100 / 50, for Use NT.
 1. Products: The following, or equal:
 - a. The Dow Chemical Company; "DOWSIL" 790.
 - b. Sika Corporation, Construction Products Division; "Sikasil" WS-290.
- B. Single-Component, Nonsag, Neutral-Curing Silicone Joint Sealant: ASTM C920, Type S, Grade NS, Class 50, for Use NT.
 1. Products: The following, or equal:
 - a. Dow Corning Corporation; "DOWSIL 795 Building Sealant".
 - b. Sika Corporation, Construction Products Division; "Sikasil WS-295."
- C. Single-Component, Nonsag, Non-Bleed, Neutral-Curing Silicone Joint Sealant: ASTM C920, Type S, Grade NS, Class 50, for Use G, M, A and O.
 1. Products: The following, or equal:
 - a. The Dow Chemical Company; "DOWSIL 756 SMS."
 - b. Momentive Performance Materials; "SCS9000 SilPruf NB."
- D. Single-Component, Nonsag, One Part RTV Neutral-Curing Silicone Joint Sealant: ASTM C920, Type S, Grade NS, Class 25, designed for adhering to low energy surfaces common in sheet or peel and stick weather resistant barriers.
 1. Products: The following, or equal:
 - a. The Dow Chemical Company; "DOWSIL" 758.
 - b. Sika Corporation, Construction Products Division; "Sikasil-N Plus."
- E. Mildew-Resistant, Single-Component, Acid-Curing Silicone Joint Sealant: ASTM C920, Type S, Grade NS, Class 25, for Use NT, A and O.
 1. Products: The following, or equal:
 - a. The Dow Chemical Company; "DOWSIL 786 Mildew Resistant."

- b. Momentive Performance Materials; GE Silicones “Sanitary SCS1700.”

2.4 URETHANE JOINT SEALANTS

- A. Single-Component, Nonsag, Urethane Joint Sealant: ASTM C920, Type S, Grade NS, Class 35, for Use NT.
 - 1. Products: The following, or equal:
 - a. BASF Master Builders Solutions; “MasterSeal NP 1.”
 - b. Sika Corporation, Construction Products Division; “Sikaflex-1a.”
- B. Multicomponent, Nonsag, Urethane Joint Sealant: ASTM C920, Type M, Grade NS, Class 25, for Use NT, M, A and O.
 - 1. Products: The following, or equal:
 - a. BASF Master Builders Solutions; “MasterSeal NP 2.”
 - b. Sika Corporation, Construction Products Division; “Sikaflex-2c NS.”
- C. Multicomponent Urethane Joint Sealant: ASTM C920; self-leveling, Type M, Grade P, Class 25, Uses T, M, A, O, and approved by manufacturer for wide joints up to 1-1/2 inches.
 - 1. Products: The following or equal:
 - a. BASF Master Builders Solutions; “MasterSeal SL 2.”
 - b. Sika Corporation, Construction Products Division; “Sikaflex 2c SL.”

2.5 BUTYL JOINT SEALANTS

- A. Butyl-Rubber-Based Joint Sealants: ASTM C1311 and FS TT-S-001657, Type I.
 - 1. Products: The following, or equal:
 - a. Bostik, Inc.; “Chem-Calk 300.”
 - b. Pecora Corporation; “BC-158.”

2.6 ACRYLIC LATEX JOINT SEALANTS

- A. Latex Joint Sealant: Acrylic latex or siliconized acrylic latex, nonsag, paintable, nonstaining. ASTM C 834, Type OP, Grade NF.
 - 1. Products: The following, or equal:
 - a. Pecora Corporation; “AC-20.”
 - b. Sherwin Williams; 950A.

2.7 ACOUSTICAL JOINT SEALANTS

- A. Acoustical Sealant; ASTM C834, nonsag, paintable, nonstaining latex sealant. Effectively reduce airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E90.

JOINT SEALANTS
SECTION 07 9200
3595001

1. Products: The following, or equal:
 - a. Pecora Corporation; "AC-20" or "AC-20 FTR" (Fire and Temperature Rated).
 - b. United States Gypsum Company: USG "Sheetrock Acoustical Sealant,"

2.8 JOINT SEALANT BACKING

- A. General: Provide sealant backings of material and type that are nonstaining; are compatible with joint substrates, sealants, primers and other joint fillers; and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.
- B. Cylindrical Sealant Backer Rods: Compressible, non-gassing rod-stock complying with ASTM C1330; polyethylene-jacketed polyurethane foam; butyl-rubber foam; neoprene foam; or other flexible, permanent, durable, non-absorptive closed-cell (Type C), open cell (Type O), or bi-cellular material (Type B) and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.
 1. Open cell rods shall not be used at sealant joints for horizontal surfaces.
 2. Closed cell rods shall not be used at double sealant joints.
- C. Bond-Breaker Tape: Polyethylene tape or other plastic tape as recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint filler materials or joint surfaces at back of joint where such adhesion would result in sealant failure. Provide self-adhesive tape where applicable.

2.9 SEALANT ACCESSORIES AND ADDITIONAL MATERIALS

- A. Primer: Material recommended by joint sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint sealant-substrate tests **[and field tests]**.
- B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming in any way joint substrates and adjacent nonporous surfaces, and formulated to promote optimum adhesion of sealants with joint substrates.
- C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.
- D. Spall Repair Mortar: Two-component structural epoxy binder and sand aggregate, producing a mortar that is easily worked and troweled. Early-set system designed specifically for the repair of industrial concrete floors subject to hard wheeled traffic. Compatible with joint filler and recommended by the joint filler manufacturer in writing.
 1. Products: The following, or equal:
 - a. Metzger/McGuire: "Armor-Hard."

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting joint sealant performance. Do not proceed with installation of joint sealants until unsatisfactory conditions have been corrected.
- B. Commencement of work indicates acceptance of substrates.

3.2 PREPARATION

- A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with recommendations of joint sealant manufacturer and the following requirements:
 - 1. Remove foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.
 - 2. Clean concrete, masonry, unglazed surfaces of ceramic tile, and similar porous joint substrate surfaces by brushing, grinding, blast cleaning, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining from above cleaning operations by vacuuming or blowing out joints with oil-free compressed air.
 - 3. Remove laitance and form release agents from concrete.
 - 4. Clean metal, glass, porcelain enamel, glazed surfaces of ceramic tile, and other nonporous surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants.
- B. Spall Repair: Repair spalled joints in concrete slabs to produce joints of profiles recommended by joint sealer manufacturers.
- C. Joint Priming:
 - 1. Prime joint substrates where indicated or where recommended by joint sealant manufacturer based on preconstruction joint sealant-substrate tests or prior experience.
 - 2. Apply primer to comply with joint sealant manufacturer's recommendations. Confine primers to areas of joint sealant bond; do not allow spillage or migration onto adjoining surfaces.
- D. Masking Tape:
 - 1. Use masking tape where required to prevent contact of sealant with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears.

JOINT SEALANTS
SECTION 07 9200
3595001

2. Remove tape immediately after tooling without disturbing joint seal.
- E. Remove sealant and prepare joints in existing exterior locations as directed by representative of sealant manufacturer specified in this work.

3.3 INSTALLATION OF JOINT SEALANTS

- A. General:
 1. Comply with joint sealant manufacturer's printed installation instructions applicable to products and applications indicated, except where more stringent requirements apply.
 2. Seal around penetrations, holes, gaps, surface mounted fixtures and pipes entering building including light fixtures, mounting brackets and other similar items.
- B. Sealant Installation Standard: Comply with recommendations of ASTM C1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.
- C. Joint Sealants at Building Exterior and Interior:
 1. Seal the following joints with joint sealant:
 - a. Expansion and control joints in exterior walls, copings, parapets.
 - b. Joints between metal panels.
 - c. Joints between door and window frames and adjacent materials.
 - d. Joints between cabinets and countertops and walls.
 - e. Control joints in interior partitions, including portion above ceilings.
 - f. Expansion and control joints in solid exterior soffits.
 - g. Control joints in interior ceilings and soffits.
 2. Apply continuous bead of joint sealant in the following locations during installation of materials specified elsewhere:
 - a. In lap joints of sheet metal construction.
 - b. Roofing panels and roof-related sheet metal and flashing.
 - c. Between partition floor and ceiling tracks and adjacent construction.
 - d. Between end stud of partition and adjacent construction.
 - e. Under door sills and thresholds.
 - 1) Set sills and thresholds in continuous double bead of sealant.
 - 2) Provide sealant at butt ends of thresholds against door frame, around door frame and between threshold and resilient floor covering.
 3. Apply acoustic sealant at acoustic separations to make assembly airtight.
 - a. Seal perimeter and intersections of finish.
 - b. Seal around electrical boxes and other penetrations of finish; seal holes within electrical boxes; seal conduit ends.
 - c. Seal pipes which penetrate acoustic separations.
 4. Apply joint sealant at joints not specifically mentioned above which require sealant to meet the performance criteria cited in this Section.

- D. Installation of Sealant Backer Rods: Install sealant backer rods to comply with the following requirements:
1. Install joint fillers of type indicated to provide support of sealants during application and at position required to produce the cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
 - a. Do not leave gaps between ends of joint fillers.
 - b. Do not stretch, twist, puncture, or tear joint fillers.
 - c. Remove absorbent joint fillers that have become wet prior to sealant application and replace with dry material.
 2. Install bond breaker tape between sealants where backer rods are not used between sealants and joint fillers or back of joints.
- E. Sealant Installation:
1. Install sealants by proven techniques that result in sealants directly contacting and fully wetting joint substrates, completely filling recesses provided for each joint configuration, and providing uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.
 2. Install sealants at the same time sealant backings are installed.
- F. Tooling of Nonsag Sealants:
1. Immediately after sealant application and prior to time skinning or curing begins, tool sealants to form smooth, uniform beads of configuration indicated, to eliminate air pockets, and to ensure contact and adhesion of sealant with sides of joint. Remove excess sealants from surfaces adjacent to joint.
 2. Do not use tooling agents that discolor sealants or adjacent surfaces or are not approved by sealant manufacturer.
 3. Profiles:
 - a. Provide concave joint configuration in accordance with Figure 8A in ASTM C1193, unless otherwise indicated.
 - b. Provide flush joint configuration in accordance with Figure 8B in ASTM C1193, where indicated.
 - c. Provide recessed joint configuration in accordance with Figure 8C in ASTM C1193, of recess depth and at locations indicated.
 - 1) Use masking tape to protect adjacent surfaces of recessed tooled joints.
- G. Joint Fillers in Refrigerated Rooms:
1. Apply joint filler only after rooms have been brought down to the final temperature for five calendar days.
 2. Provide supplemental heat and dual dispensing system as required to apply in strict accordance with the manufacturer's directions.

JOINT SEALANTS

SECTION 07 9200

3595001

3.4 DEFECTIVE WORK

- A. Repair damaged and defective work and eliminate functional and visual defects. Where repair is not possible replace work. Adjust joints for uniform appearance.
- B. Cut out and remove damaged or deteriorated joint sealants immediately so that and installations with repaired areas are indistinguishable from original work.

3.5 CLEANING AND PROTECTION

- A. Clean off excess sealants or sealant smears adjacent to joints as work progresses by methods and with cleaning materials approved by manufacturers of joint sealants and of products in which joints occur.
- B. Clean excess adhesive from exposed surfaces of neoprene compression seal with solvent cleaner as recommended by manufacturer.
- C. Protect joint sealants during and after curing period from contact with contaminating substances or from damage resulting from construction operations or other causes so that they are without deterioration or damage at time of Substantial Completion.

3.6 SEALANT SCHEDULE

- A. General:
 - 1. Joints in construction between interior and exterior spaces and other designated or required locations to provide effective barrier against passage of elements:
 - a. Multicomponent, Nonsag, Urethane Joint Sealant: ASTM C920, Type M, Grade NS, Class 25, for Use NT, M, A and O.
 - b. Single-Component, Nonsag, Urethane Joint Sealant: ASTM C920, Type S, Grade NS, Class 25, for Use NT.
 - 2. Specialty perimeters where required for appearance or weather tightness:
 - a. Multicomponent, Nonsag, Urethane Joint Sealant: ASTM C920, Type M, Grade NS, Class 25, for Use NT, M, A and O; capable of 50 percent extension and compression movement.
 - b. Single-Component, Nonsag, Urethane Joint Sealant: ASTM C920, Type S, Grade NS, Class 35, for Use NT.
 - c. Single-Component, Nonsag, Neutral-Curing Silicone Joint Sealant: ASTM C920, Type S, Grade NS, Class 50, for Use NT.
 - d. Single-Component, Nonsag, Neutral-Curing Silicone Joint Sealant: ASTM C920, Type S, Grade NS, Class 100 / 50, for Use NT.
- B. Exterior Locations:
 - 1. Joints Bordered by Glass: Single-component, nonsag, neutral-curing silicone joint sealant, ASTM C920, Type S, Grade NS, Class 50, for Use NT.
 - 2. Joints Bordered by Plastic: Single-component, nonsag, neutral-curing silicone joint sealant, ASTM C920, Type S, Grade NS, Class 100 / 50, for Use NT.

3. Horizontal Joints in Exterior Walks Abutting Building Walls, Interior Concrete Floors: Multicomponent urethane sealant, self-leveling; ASTM C920, Grade P, Class 25, Uses T, M and A.
 - a. Where walks abut structural slabs or stoops.
 - b. Where walks abut exterior wall of buildings.
 - c. Where exposed interior concrete slabs abut vertical surfaces.
 - d. Where sealant is shown on the Drawings for concrete slabs.
4. Sheet Metal and Roof Accessory Sealants: Types recommended by roofing manufacturer and complying with requirements of this Section.
5. Exterior Sheet Metal Lap Joints: Types recommended by manufacturer and complying with requirements of this Section.
6. Joints Between Concrete Panels, and Between Concrete Panels and Other Work: Single-component, nonsag, neutral-curing silicone joint sealant, ASTM C920, Type S, Grade NS, Class 100 / 50, for Use NT and formulated to reduce or eliminate dirt pickup, surface streaking, and substrate staining.
7. Exterior Metal Panel Butt Joints and Trim: Types recommended by manufacturer and complying with requirements of this Section.
8. Sills and Thresholds: Butyl-rubber-based joint sealants, ASTM C1311.
9. All Other Exterior Joints:
 - a. Single-component, nonsag, neutral-curing silicone joint sealant, ASTM C920, Type S, Grade NS, Class 100 / 50, for Use NT.
 - b. Single-component, nonsag, neutral-curing silicone joint sealant, ASTM C920, Type S, Grade NS, Class 50, for Use NT.
 - c. Around perimeters of frames where door, window and louver frames abut concrete, masonry or other building materials.
 - d. Expansion and control joints in masonry.
 - e. Masonry at dissimilar material or at dissimilar masonry.
 - f. Miscellaneous locations where sealant is shown on Drawings.

C. Interior Locations:

1. Expansion and Control Joints:
 - a. Multicomponent, Nonsag, Urethane Joint Sealant: ASTM C920, Type M, Grade NS, Class 25, for Use NT, M, A and O.
 - b. Single-Component, Nonsag, Urethane Joint Sealant: ASTM C920, Type S, Grade NS, Class 35, for Use NT.
 - c. Around perimeters of frames where door, window and louver frames abut concrete, masonry or other building materials.
 - d. Expansion and control joints in masonry walls.
 - e. Masonry at dissimilar material or at dissimilar masonry.
 - f. At miscellaneous locations where sealant is shown on Drawings.
2. Sills and Thresholds: Butyl-Rubber-based joint sealants, ASTM C1311.

JOINT SEALANTS

SECTION 07 9200

3595001

3. Interior Wet Areas, Around Plumbing Fixtures, Countertops Abutting Walls, Food Service Applications: Mildew-resistant, single-component, acid-curing silicone joint sealant, ASTM C920, Type S, Grade NS, Class 25, for Use NT, A and O.
4. Interior Static Dry Joints as Required to Dress Appearance: Acrylic latex or siliconized acrylic latex joint sealant, ASTM C 834, Type OP, Grade NF
5. Sound Control Applications: Acoustical Sealant, ASTM C 834
 - a. Where Required for Sound Control with Limited Flame Spread: Acoustical sealant, ASTM C 834, fire-rated type.

END OF SECTION

*P:\Sacramento\3595 Tracy Unified School District\001-000_Villalovoz ES New Shade Structures\08 Specifications\06 SPEC\04
FINAL\Villalovoz\07 9200_Joint Sealants.docx
Last Updated: March 24, 2021*

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Painting and painter's finish on all exposed exterior and interior surfaces, except prefinished items and unless otherwise noted, as required to complete finishing of the Work. The Work includes, but is not necessarily limited to, the following specific items:
1. Paint, stain or otherwise finish all new surfaces.
 2. Back priming of concealed surfaces, except as otherwise specified.
 3. Paint, repaint or finish of existing painted surfaces altered, defaced or damaged as a result of work of this Contract.
 4. Paint site items which are not prefinished, including posts, screens, panels, bollards, supports, rails and other similar improvements.
 5. Mechanical and plumbing vents on roof.
 6. Unpainted or unfinished exposed building components, pipes and conduit, including sprinkler piping, and metal ductwork, which run exposed across finished or painted surfaces.
 7. Painting work in rooms where finishing work is performed, including painting new surfaces as specified and re-painting existing surfaces within the room, unless otherwise indicated. Re-painting existing surfaces shall be with minimum of one coat using specified coatings compatible with existing.
- B. Surface treatment, priming and coats of paint specified in this Section are in addition to shop priming and surface treatment specified under other Sections unless otherwise noted.
- C. Items Not Included in This Section:
1. Factory and shop-prefinished items as specified in various Sections.
 2. Painting specified elsewhere and included in respective Sections, including but not necessarily limited to shop priming.

1.2 WORK NOT TO BE PAINTED UNLESS OTHERWISE INDICATED

- A. Exposed exterior concrete and concrete slab surfaces, except as noted.
- B. Suspended acoustical ceilings and acoustical tile, except as noted.
- C. Pre-finished casework and other factory and shop-prefinished items as specified in various Sections.
- D. Finish hardware except prime coated items.
- E. Items typically not to be painted including, but not limited to, the following:
1. Glass.

PAINTING
SECTION 09 9100
3595001

2. Ceramic tile.
 3. Membrane roofing.
 4. Safety nosings.
 5. Resilient floor covering and base.
 6. Carpet.
 7. Pre-finished paneling.
 8. Plastic laminate.
 9. Porcelain enamel.
 10. Vinyl wallcovering, except where noted.
- F. Aluminum doors, windows, frames and railings.
- G. Metal or plastic toilet partitions.
- H. Items of chromium, copper, nickel, brass, bronze or stainless steel.
- I. Surfaces in concealed areas such as furred spaces.
- J. Tops of gravel stop flanges (including priming) where roofing material will be adhered to.
- K. Wall areas concealed by cases, counters, cabinets, chalkboards, tackboards (prime coat only required).
- L. Piping or conduit including brackets and similar items therewith running on or across unpainted or otherwise unfinished walls or ceilings.
- M. Galvanized gratings, recessed foot grilles, and thresholds.
- N. Structural steel scheduled to receive fireproofing.

1.3 RELATED REQUIREMENTS

- A. Section 01 6116, Volatile Organic Compound (VOC) Restrictions; for VOC limits pertaining to adhesives, sealants, fillers, primers, and coatings.
- B. Section 01 8113, Sustainable Design Requirements, for CAL-Green general requirements and procedures.
- C. Section 07 6200, Sheet Metal Flashing and Trim.
- D. Section 07 9200, Joint Sealants.
- E. Section 09 2900, Gypsum Board.
- F. Divisions 22, 23 and 26, Exposed piping, ductwork and conduit.

1.4 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).

- B. California Green Building Standards Code (CAL Green), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- C. ASTM International (ASTM):
 - 1. D523: Standard Test Method for Specular Gloss.
 - 2. D4263: Standard Test Method for Indicating Moisture in Concrete by the Plastic Sheet Method.
 - 3. D6386: Standard Practice for Preparation of Zinc (Hot-Dip Galvanized) Coated Iron and Steel Product and Hardware Surfaces for Painting.
 - 4. D7396: Standard Guide for Preparation of New, Continuous Zinc-Coated (Galvanized) Steel Surfaces for Painting.
- D. Master Painters Institute (MPI):
 - 1. Architectural Painting Manual Guide Specification.
- E. The Association for Materials Protection and Performance (AMPP):
 - 1. SSPC-Society for Protective Coatings/ National Association of Corrosion Engineers International (NACE):
 - a. SSPC-SP 1: Solvent Cleaning.
 - b. SSPC SP-10/NACE No. 2: Near-White Metal Blast Cleaning.
 - c. SSPC-SP 16: Brush-Off Blast Cleaning of Coated and Uncoated Galvanized Steel, Stainless Steels, and Non-Ferrous Metals.

1.5 ADMINISTRATIVE REQUIREMENTS

- A. Submittal Procedures:
 - 1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
 - 2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
 - 3. Sustainable Design Submittals shall comply with the additional requirement of Section 01 8113, Sustainable Design Requirements.

1.6 ACTION SUBMITTALS

- A. Product Data: Submit list and complete descriptive data of products proposed for use. Include manufacturer's specifications, published warranty or guarantee, and application instructions. Cross-reference to paint system and locations of application areas.
- B. Samples:
 - 1. Appropriately label and identify each sample, including location and application. Include **[Architect's number as scheduled on the Drawings,]** manufacturer's name, color number, and gloss units.
 - 2. Prepare on 8 inch x 10 inch card stock for selected colors and finishes.

PAINTING
SECTION 09 9100
3595001

3. Submit sufficiently ahead of work progress to allow for color board assembly and distribution.
4. Resubmit as requested until required sheen, color, and texture are approved.

1.7 INFORMATIONAL SUBMITTALS

- A. Statement of applicator qualifications.
- B. Sustainable Design:
 1. General:
 - a. Submit information necessary to establish and document compliance with the California Green Building Standards Code.
 - b. Sustainable design submittals are in addition to other submittals.
 2. The following information shall be provided:
 - a. Paints and Coatings: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.

1.8 CLOSEOUT SUBMITTALS

- A. Guarantee: Submit Subcontractor's guarantee.

1.9 MAINTENANCE MATERIAL SUBMITTALS

- A. At completion of the Work, deliver to Owner extra stock of paint of each color used in each coating material used.
- B. Containers shall be full, tightly sealed, and clearly marked.
- C. Provide the following quantities:
 1. Field Colors: 1 five-gallon container.
 2. Accent Colors: 1 one-gallon container.

1.10 QUALITY ASSURANCE

- A. Use only new materials and products.
- B. Single-Source Responsibility:
 1. To the maximum extent practicable, select a single manufacturer to provide all materials required by this Section, using additional manufacturers to provide systems not offered by the selected principal manufacturer.
 2. For each individual system:
 - a. Provide primer and other undercoat paint produced by same manufacturer as finish coat.
 - b. Use thinner within manufacturer's recommended limits.
- C. Source Quality Control: Material shall be best grade products of type specified and listed below as regularly manufactured by these manufacturers. Materials not bearing

manufacturer's identification as standard "best grade product" of their regular line will not be considered for use.

- D. Materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.
- E. Materials and application procedures shall comply with local, state and federal air pollution control regulations.
- F. Manufacturer's representative from coating supplier shall visit the site prior to application to review and approve the specified systems. Discrepancies or recommended changes shall be submitted to the Architect for consideration prior to finalization of submittal.
- G. Site Application Mockup:
 - 1. Prior to ordering materials and unless waived by the Architect in writing, the Contractor shall provide large scale mockup areas for all colors, both interior and exterior, directly applied to the building for final color approval by the Architect.
 - 2. Minimum Size:
 - a. Ceiling Areas: Finish a panel 10 feet square.
 - b. Wall Areas: Finish a panel 8 feet long by full height of wall.
 - c. Finish a portion of other items as directed by Architect.
 - 3. Provide up to 2 adjustments at no extra cost to the Owner.
 - 4. Paint shall not be ordered or applied until such large scale sample(s) have been reviewed and approved by the Architect in writing. These requirements as described herein may be waived by the Architect in writing only.

1.11 DELIVERY, STORAGE AND HANDLING

- A. Deliver undamaged products to job in manufacturer's sealed containers and/or original bundles with tags and labels intact.
- B. Store materials in protected, clean, dry conditions off of ground and in areas which will not interfere with the progress of the Work.
- C. Transport, store and handle in strict accordance with the manufacturer's written recommendations and as specified below.
- D. Remove paint-soiled rags and waste from premises at end of each day's work or store in metal containers with metal covers.
- E. Paint stored at site, shall be in separate structure not less than 60 feet from any other building or structure. Remove empty containers and soiled rags as they accumulate. At completion, remove structure, cleanup area, and leave in original condition.

PAINTING
SECTION 09 9100
3595001

1.12 FIELD CONDITIONS

- A. Do not apply paints and coatings under conditions which jeopardize quality or appearance of painting or finishing.
- B. Cover or otherwise protect finished work of other trades and surfaces not being painted concurrently or not to be painted.
- C. Exterior:
 - 1. Comply with manufacturer's recommendations as to environmental conditions under which coatings and coating systems can be stored and applied.
 - 2. Do not apply exterior paint when air or surface temperature is under 50 degrees F or when air or surface temperature will be below 50 degrees F for 48 hours after painting.
 - 3. Do not apply immediately following snow, rain, dew or during foggy weather.
 - 4. Do not apply when temperature is over 85 degrees F except in protected or shaded areas.
- D. Interior:
 - 1. Do not apply interior paint when air or surface temperature is below 50 degrees F unless temperature is maintained constantly.
 - 2. Do not apply when ventilation is inadequate to maintain humidity lower than dew point of coldest wall.
- E. Use moisture meter for determining proper moisture levels of surfaces for painting.
- F. Report to Architect in writing upon discovery of any prime coat painting specified in other Sections of Specifications that would prevent proper application of specified finish.
- G. Furnish, erect and remove scaffolding and planks required for work under this Section. Conform to state and local codes, rules and regulations.

1.13 EXISTING CONDITIONS

- A. Existing Surfaces:
 - 1. Paint or otherwise finish all existing surfaces as indicated or scheduled on the Drawings.
 - 2. Work includes primer, paint, repaint or finish of existing painted surfaces altered, defaced or damaged as a result of work under this Contract.
- B. Existing surfaces to be painted include:
 - 1. Exterior wall surfaces, including fascia, trim.
 - 2. Soffits and exterior ceilings including exposed roof framing.
 - 3. Doors and frames, both wood and metal.
 - 4. Window frames, trim and solid infill panels except unpainted or prefinished aluminum.

5. Exposed conduit, piping, brackets, supports, and similar metal fabrications.
6. Downspouts and gutters.
7. Parapet caps and exposed flashings.
8. Mechanical well walls, all surfaces.
9. Concrete foundation where exposed below painted wall surfaces.
10. Roll-up doors and frames.
11. Closure panels between relocatable buildings.
12. Enclosure walls, screen walls, equipment yards.
13. Other work as shown on the Drawings, specified, or as required for a complete Project.

1.14 GUARANTEE

- A. Contractor: Under conditions of its Guarantee under the Contract, paint colors shall be substantially unchanged and finishes shall maintain their original adherence without showing blisters, flaking, peeling, scaling, staining or unusual deterioration or other defects.

PART 2 - PRODUCTS

2.1 DESIGN AND PERFORMANCE CRITERIA

- A. Sustainable Design:
 1. VOC emissions for field-applied paints and coatings must comply with limits specified in Section 01 6116.

2.2 MANUFACTURERS AND COATING PRODUCTS

- A. Products are specified under "Paint Systems" in Part 3 below and are manufactured by Kelly-Moore, except as otherwise indicated. Equivalent products to those scheduled manufactured by Sherwin-Williams, PPG Architectural Finishes, Glidden Professional, Benjamin Moore & Co., Dunn-Edwards, Vista, or equal, are acceptable.
- B. Materials selected for coating systems for each type surface shall be the product of a single manufacturer or shall be acceptable to manufacturer of finish coating for system.
- C. If more than one quality level of product type is marketed, use material of highest quality.

2.3 MIXING AND TINTING

- A. Deliver paints and stains ready mixed to jobsite. On-site color mixing or tinting will not be allowed.
- B. Each kind of coating for paint finishes shall be factory-mixed to match approved samples, colors, and ready for immediate application.
- C. Mix proprietary products in strict accordance with manufacturer's printed directions.

PAINTING
SECTION 09 9100
3595001

- D. Thinning, if permitted by manufacturer for a specific coating, shall be in accordance with manufacturer's instructions. Thinning of other products shall be in accordance with standard practice.

2.4 COLORS

- A. Colors shall be as scheduled on the Drawings.
- B. Architect will prepare a color schedule with samples for guidance of painter and reserves right to select, allocate, and vary colors on different surfaces throughout building.
 - 1. Colors selected by Architect may be from manufacturer's full range standard palette or be custom mixed.
 - 2. Unless otherwise indicated on the Drawings, different colors will be selected for different materials such as walls, trim, and doors.
- C. Colors to be selected by the Architect, or where scheduled on the Drawings, are solely for the purpose of conveying color information and do not imply manufacturer's approval or waiver of the requirement that all coatings be from the same manufacturer, unless a specific system is not available from the primary manufacturer.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Prior to the work of this Section, carefully inspect and verify that the installed work of all other trades is complete to the point where this work may properly commence.
- B. Verify that painting may be performed in accordance with the approved design.
- C. In the event of discrepancy, immediately notify Architect. Do not proceed in discrepant areas until discrepancies have been fully resolved.

3.2 PREPARATION

- A. General:
 - 1. Surface preparation and product application shall be in accordance with manufacturer's printed instructions.
 - 2. In addition to prime coats indicated (primer, sealer, filler, undercoat), use two finish coats minimum, and additional coats as required for complete coverage and good appearance of scheduled finish coat.
 - 3. Surfaces to receive new finish shall be properly prepared prior to application of finish coatings.
 - 4. Do not apply paint, enamel, stains or varnishes to wet, damp, dusty, finger-marked, rough, unfinished, or defective surfaces until such defects have been corrected.
- B. Wood - Interior:

1. Thoroughly sandpaper and dust off woodwork; putty nail holes, cracks, and other defects after first coat to match color of paint. Putty where finish will be clear.
2. First coat on wood surfaces shall be sanded smooth. Other coats, except finish coat, shall be lightly sanded and dusted before and between each coat.
3. Smoothing, rubbing and sand-papering shall be sufficient to insure good results. Sand down all raised grain or rough surfaces and re-coat. Knots, pitch pockets and sappy portion of wood, all nail holes, cuts, cracks and other defects in wood shall have any necessary extra treatment to provide proper paint base.

C. Wood – Exterior:

1. Surfaces shall be dry and free of grease and splatters.
2. Rough surfaces shall be sanded smooth. **[Do not sandpaper resawn surfaces.]**
3. At opaque finish, fill nail holes, cracks, open joints, and other defects with filler after priming coat has dried. Exposed nail heads shall be spot primed.
4. Avoid painting surfaces while exposed directly to hot sun.
5. Smooth surfaces shall be sanded thoroughly to allow proper penetration and adhesion. Areas exhibiting tannic acid staining shall receive two coats of primer waiting 24 hours between coats. Sand and prime as soon as possible after installation to avoid UV degradation of unpainted wood surface.
6. Mildew, if present, shall be removed by scrubbing with a commercial mildew wash in accordance with manufacturer's directions.

D. Metals-General:

1. On metal work, only such sanding will be required as is necessary to provide for complete bonding of coats.
2. Steel and ironwork shall be scraped clean of scale, and rust and any grease shall be entirely removed.
3. Touch-up scratched and damaged places on metal priming coats.
4. Galvanized or zinc-coated metal shall be given an approved acid treatment 48 hours before paint is applied.
5. Prep and prime coat factory or shop primed metal products, including metal doors and frames, exposed framing, and other exposed metal if material was not shop primed.
6. Metal surfaces receiving epoxy coatings shall have stripe coat applied at all welds, edges, joints, etc., with epoxy primer prior to application of primer.

E. Metals–Galvanized Surfaces:

1. Surfaces shall be cleaned, and profiled where specified, prior to receiving applied coatings in accordance with ASTM D6386 or ASTM D7396 for sheet products.
 - a. Methods shall be selected based on age of galvanized coating, condition of surface and intended paint coating.
 - b. Care shall be taken not to damage the zinc coating.
 - c. Do not use phosphate treatment on galvanized surfaces scheduled to receive zinc-rich primers.

PAINTING
SECTION 09 9100
3595001

2. Comply with additional recommendations included in the AGA document "Duplex Systems: Painting Over Hot Dip Galvanized Steel."
3. Comply with any additional procedures required by the coating manufacturer.

3.3 REPAINTING EXISTING EXTERIOR SURFACES

A. General:

1. Exterior surfaces required to be re-painted, shall be power washed with surfactant, followed by rinsing to remove all loose coatings, chalk, dirt, efflorescence, oils, and other contaminants that would inhibit bond of new coating.
2. Mold or mildew shall be treated with bleach solution followed by thorough rinsing.
3. Protect openings into interior spaces during power washing including louvers, vents, vent screeds, grilles, to prevent water from entering interior areas including, attics and soffits.

B. Ferrous Metal: Steel framing, metal doors and frames, louvers, metal ductwork, and similar Items:

1. Remove all flaking, peeling and poorly bonded coatings, including rust from metal surfaces using power tool sanders or equivalent equipment. Feather edge remaining coatings.
2. Solvent scrub with MEK, all exposed bare metal, shop applied pretreatment and chalked coatings.
3. Spot prime exposed bare metal and metal pre-treatment prior to application of specified prime coat.

C. Galvanized Metal: Down spouts, wall caps, and Other Exposed Galvanized Metal.

1. Remove all loose, flaking or peeling coatings by scraping, chipping or sanding. Feather all rough edges by sanding.
2. Apply phosphoric acid etch pre-treatment to exposed galvanized metal.

D. Plaster:

1. Remove loose coatings using hand or power tools.
2. Patch plaster areas where original material has cracked, spalled or otherwise been removed with compatible material. Fill areas completely to provide smooth, even surface for refinishing. Spot prime patches prior to proceeding.
3. Patch masonry joints with cracks or missing material with compatible materials.

E. Wood Siding and Trim:

1. Remove loose, flaking or peeling coatings by scraping, chipping or sanding. Feather rough edges by sanding.
2. Surfaces that exhibit moderate to heavy chalk deposits shall be thoroughly cleaned to sound substrate by wire brushing, sanding, or power washing.
3. Spot prime bare wood, exposed nail and fastener heads prior to application of specified prime coat.

4. Glossy surfaces shall be dulled by sanding. Crystalline deposits shall be removed by flushing with water from a hose.
5. Mildew, if present, shall be removed by scrubbing with a commercial mildew wash in accordance with manufacturer's directions.

3.4 CAULKING

- A. Caulk all cracks in finished surfaces.
- B. Seal around any wall openings where original sealant is not fully sealing.
- C. Provide sealant at material transitions and intersections as required.

3.5 PROTECTION

- A. Hardware, fixture canopies, outlet covers, switch plates and other such items shall be removed or loosened and replaced after completing work as required for painting and finishing. Protect items until reinstalled.
- B. Protect work and work of others during progress against damage. Leave such work clean and whole. Correct damage by cleaning, repairing, replacing or repainting as directed.
- C. Provide necessary drop cloths for protection of work. Cover finished surfaces adjacent to work.

3.6 APPLICATION

- A. General:
 1. Do not apply initial coating until moisture content of surface is within limitations recommended by paint manufacturer.
 2. Apply coatings in accordance with manufacturer's recommendations and the additional requirements, as applicable, of the Architectural Painting Manual Guide Specifications for application methods and paint systems.
 3. Flow coat on evenly and well brushed in. Should dead spots occur, touch-up before next coat is applied. Should spots or cracks burn through after final coat is applied, apply additional coats to entire surface as necessary to remedy defects.
 4. Rate of application shall be within limits recommended by paint manufacturer for surface involved.
- B. Thicknesses: Rate of application shall be within limits recommended by paint manufacturer for surface involved and comply with the following.
 1. Paint materials shall be applied in manner to average 1.5 to 3 Dry Mills in thickness for the total number of coats scheduled.
 2. Provide Tooke Dry Mill Coating Inspection Gauge manufactured by Micro Metrics Company to the Project Inspector for inspection of finished coating systems, if requested.

PAINTING
SECTION 09 9100
3595001

- C. Refinish whole area where portion of finish is not acceptable.
- D. Adjust natural finishes as necessary to obtain identical appearance on veneers and solid stock.
- E. Equipment adjacent to walls shall be disconnected, using workers skilled in appropriate trades, and moved to permit wall surfaces to be painted. Following completion of painting, they shall be expertly replaced and reconnected.
- F. Top and bottom edges of all doors shall receive same paint system finish required for door faces.
- G. Do not paint over fire-rating labels, fusible links, or sprinkler heads.

3.7 DEFECTIVE WORK

- A. Painter shall be responsible for damage or unsuitable work, including that caused by improperly prepared surfaces. Refinishing shall be at no cost to the Owner. Repair work damaged during construction; touch-up or refinish as necessary any abraded, stained or otherwise damaged surfaces.

3.8 CLEANING AND PROTECTION

- A. Thoroughly clean any drips, splatters, spills, splashes, etc., from walls, floor or other surfaces, with no damage to those surfaces.
- B. Protect work and materials of this Section prior to and during installation, and protect the installed work and materials of other trades.
- C. In the event of damage, make all repairs and replacements necessary to the approval of the Architect at no additional cost to the Owner.

3.9 PAINT SYSTEMS

- A. General:
 - 1. Only major areas are scheduled, but miscellaneous and similar items and areas within room or space shall be treated with suitable system.
 - 2. This Specification shall serve as guide and is meant to establish procedure and quality. Confer with the Architect to determine exact finish desired.
 - 3. Number of coats scheduled is minimum. Additional coats shall be applied at no additional cost as required to hide base material completely, produce uniform color, and provide required and satisfactory finish.
- B. Gloss and Sheen Ratings: Paint gloss shall be defined as the sheen rating of applied paint, in accordance with the following limits in conformance with Master Painters Institute, Inc. (MPI) Standards according to ASTM D523. Not all of the Gloss Levels are necessarily scheduled or used on this Project.

Gloss Level	Description	Units @ 60 degrees	Units @ 85 degrees
G1	Matte or Flat finish	0 to 5	10 max.
G2	Velvet finish	0 to 10	10 to 35
G3	Eggshell finish	10 to 25	10 to 35
G4	Satin finish	20 to 35	35 min.
G5	Semi-Gloss finish	35 to 70	
G6	Gloss finish	70 to 85	
G7	High-Gloss finish	> 85	

C. Clarification of System Terminology:

1. Interior paint Systems are specified and identified herein by initial letters "INT."
2. Exterior paint Systems are specified and identified herein by initial letters "EXT."
3. The numbers following "INT" and "EXT" for each System identifies the substrate to be coated.
4. Initial numbers for each System identify the substrate to be coated summarized as follows with further clarification included with the System description:

CODE	DESCRIPTION
3.1	Concrete
3.2	Cement Plaster
4	Masonry
5	Metal
6	Wood
9.2	Gypsum Board
9.3	Acoustical Panels and Tile

5. The letter following substrate number identifies the general finish coat chemistry summarized as follows:

CODE	DESCRIPTION
A	Standard acrylic
B	Non-bridging vinyl acrylic
C	Epoxy-like acrylic
D	Semi-transparent stain
E	Elastomeric
F	High performance epoxy-like acrylic
G	Lacquer
H	Aliphatic urethane
I	Fire Retardant Intumescent
J	Acrylic Urethane
K	PVA primer
L	Acrylic primer
M	Premium performance acrylic polymer

6. Hyphenated suffix identifies the topcoat gloss level.

PAINTING
SECTION 09 9100
3595001

3.10 INTERIOR PAINTING SYSTEMS

INT 5.1A-5

Acrylic on Exposed Steel, Not Shop Primed - Gloss Level 5

1 coat	5725 DTM	Acrylic Primer
2 coats	1050 Premium Professional	Latex Semi-Gloss

Note: Modify scheduled finish coat if lower gloss level is selected by Architect.

INT 5.2A-5

Acrylic on Shop Primed Metal Including Hollow Metal Doors & Frames - Gloss Level 5

2 coats	1050 Premium Professional	Latex Semi-Gloss
---------	---------------------------	------------------

Note: Modify scheduled finish coat if higher or lower gloss level is selected by Architect.

INT 5.2M-6

Premium Performance Acrylic on Exposed Metal - Gloss Level 6

1 coat	Devacryl 1440	Waterborne Acrylic
2 coats	Devacryl 1449	100% Acrylic-Gloss

INT 9.2A-1

Acrylic on Gypsum Board - Gloss Level 1; at theater stage

1 coat	971 AcryPlex	PVA Primer/Sealer
2 coats	Speedhide 6-753 by PPG Architectural Finishes	Acrylic Latex Flat Black

INT 9.2A-3

Acrylic on Gypsum Board, textured finish - Gloss Level 3

1 coat	971 AcryPlex	PVA Primer/Sealer
2 coats	1010 Premium Professional	Latex Eggshell

INT 9.2A-5

Acrylic on Gypsum Board, smooth finish - Gloss Level 5

1 coat	971 AcryPlex	PVA Primer/Sealer
2 coats	1050 Premium Professional	Latex Semi-Gloss

Note: Provide additional topcoat at toilet rooms and food service areas.

INT 9.3B-1

Acrylic on Acoustic Panels and Tiles - Gloss Level 1

1 coat	1005 Ceiling Paint	Non-Bridging Vinyl Acrylic Flat
--------	--------------------	---------------------------------

3.11 EXTERIOR PAINTING SYSTEMS

EXT 3.2A-2

Acrylic on Cement Plaster - Gloss Level 2

1 coat	247 AcryShield	Acrylic Masonry Primer
2 coats	1210 Premium Professional	100% Acrylic Low Sheen

EXT 5.1A-5

Acrylic over Unprimed Steel - Gloss Level 5

1 coat	5725 DTM	Metal Primer
2 coats	1215 Premium Professional	100% Acrylic Semi-Gloss

EXT 5.2A-5

Acrylic over Shop Primed Metal Doors and Frames, Steel Frame, Mechanical and Electrical Equipment, and Panels - Gloss Level 5

2 coats	2888 DuraPoxy HP	Acrylic Urethane Semi-Gloss
---------	------------------	-----------------------------

EXT 5.3A-5

Premium Acrylic over Waterborne Primer on Galvanized Metal – Gloss Level 5

Pretreatment	SSPC SP-1	Heavy-duty cleaner
1 coat	5725 DTM	Acrylic Primer
2 coats	1215 Premium Professional	100% Acrylic Semi-Gloss

Note: Provide pretreatment and primer if preparation and primer not applied in shop.

EXT 5.4A-5

Acrylic over Waterborne Primer on Aluminum – Gloss Level 5

Pretreatment	Devco Devprep 88	Heavy-duty cleaner
1 coat	5725 DTM	Acrylic Primer
2 coats	1215 Premium Professional	100% Acrylic Semi-Gloss

Note: Provide pretreatment and primer if preparation and primer not applied in shop.

3.12 MISCELLANEOUS PAINTING

- A. Mechanical and Electrical Equipment, Conduits and Piping: Paint exposed items as scheduled using appropriate system for material and whether or not item has been factory-primed.
- B. Exposed Insulation-Covered Piping: Size with Arabol, or equal latex type adhesive, and apply 2 coats of semi-gloss enamel.
- C. Material Visible through Grilles, Screens, Louvers, Vents and Screens and Exposed Hardware Cloth Screening: Painted flat black to make them as unnoticeable as possible.
- D. Mechanical Equipment: Paint mechanical equipment housings where indicated on the Drawings.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Metal-framed porcelain enamel markerboards.
 - 2. Horizontal sliding markerboards.

1.2 RELATED REQUIREMENTS

- A. Section 01 6116, Volatile Organic Compound (VOC) Restrictions; for VOC limits pertaining to adhesives, sealants, fillers, primers, and coatings.
- B. Section 01 8113, Sustainable Design Requirements, for CAL-Green general requirements and procedures.
- C. Section 12 3216, Manufactured Plastic-Laminate-Clad Casework.

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CAL Green), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Submittal Procedures:
 - 1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
 - 2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Contract Closeout and Final Cleaning.
 - 3. Sustainable Design Submittals shall comply with the additional requirement of Section 01 8113, Sustainable Design Requirements.

1.5 ACTION SUBMITTALS

- A. Shop Drawings: Submit showing all parts, connections and anchorages, adjacent materials, fully dimensioned and noted. Include in-wall blocking requirements.
- B. Product Data: Manufacturer's complete descriptive data of all products proposed for use. Include manufacturer's specifications, installation instructions, and maintenance instructions.
- C. Samples: The following samples are required.
 - 1. Submit sample for each type of board and trim components to Architect for review.

MARKERBOARDS
SECTION 10 1116
3595001

2. Manufacturer's full range of colors for Architect's selection.

1.6 INFORMATIONAL SUBMITTALS

A. Sustainable Design:

1. General:
 - a. Submit information necessary to establish and document compliance with the California Green Building Standards Code.
 - b. Sustainable design submittals are in addition to other submittals.
2. The following information shall be provided:
 - a. Adhesives and Sealants: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.
 - b. Composite Wood: Evidence of compliance that products meet formaldehyde limits of current CARB Airborne Toxic Control Measure (ATCM) as specified in Section 01 6116.

B. Sample of manufacturer's warranty.

1.7 CLOSEOUT SUBMITTALS

- A. Warranty/Guarantee: Submit executed warranty and Subcontractor's guarantee.

1.8 QUALITY ASSURANCE

- A. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.
- B. Single Source Responsibility: Use materials and products of one manufacturer whenever possible.
- C. Materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.

1.9 DELIVERY, STORAGE AND HANDLING

- A. Deliver undamaged products to job in manufacturer's sealed containers and/or original bundles with tags and labels intact.
- B. Store materials in protected, dry conditions off of ground and in areas so as to not interfere with the progress of the work.
- C. Transport, store and handle in strict accord with the manufacturer's written recommendations.

1.10 WARRANTY

- A. Manufacturer: In addition to the Contractor's and Subcontractor's Guarantee, furnish Owner with the following manufacturer's fully executed written warranties against defects in materials and workmanship including against warping of sliding panel units.

1. Dry Erase Markerboards: Lifetime of the building.
2. Other Products: As available from the manufacturer.

PART 2 - PRODUCTS

2.1 DESIGN AND PERFORMANCE CRITERIA

- A. Sustainable Design:
1. VOC emissions for field-applied adhesives, sealants, and sealant primers must comply with limits specified in Section 01 6116.
 2. Composite wood products must meet current formaldehyde emission limits of CARB Airborne Toxic Control Measure (ATCM) as specified in Section 01 6116.

2.2 HORIZONTAL SLIDING MARKERBOARDS

- A. Manufacturer and Product: Top hung sliding panels and fixed back panels; "Horizontal Sliding Units" by Claridge Products and Equipment, Inc., 800-434-4610 as specified, or equal.
1. Frame: Frame and exposed metal members to be of 6063-T5 alloy, anodized satin finish, aluminum extrusions.
 2. Tray: 2-3/4 inch deep aluminum tray with end closures.
 3. Map Rail: Full length aluminum map rail with cork insert furnished with one combination hook/clip for each 24 inch of length and two flag holders.
 4. Hardware: Rolling hardware to be nylon tipped, ball bearing rollers of sufficient size and number to enable smooth and easy operation of panels.
 5. Tracks: As standard with manufacturer for number of panels at each configuration.
 6. Panel Finish: Sliding panel units and back fixed panel shall be specified markerboard.
 7. Dimensions:
 - a. Overall Size: Typical units, unless indicated otherwise, shall be 3 panels 7'-0" wide x 4'-0" high each.
 - b. Where other sizes are shown, markerboards within sliding Units shall not exceed 5'-6" in width.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Prior to installation, carefully examine and verify that the installed work of all other trades is complete to the point where this installation may properly commence.
- B. Verify that specified items may be installed in accord with the approved designs.
- C. In the event of discrepancy, immediately notify Architect. Do not proceed in discrepant areas until discrepancies have been fully resolved.

MARKERBOARDS

SECTION 10 1116

3595001

3.2 INSTALLATION – MARKERBOARDS

- A. Install items where indicated on the Drawings, in full accord with all reviewed shop drawings and the manufacturer's recommendations, anchoring components firmly in place for long life under hard use.

3.3 PROTECTION

- A. Protect work and materials of this Section prior to and during installation, and protect the installed work and materials of other trades.
- B. In the event of damage, make all repairs and replacements necessary to the approval of the Architect at no additional cost to the Owner.

END OF SECTION

*p:\sacramento\3595 tracy unified school district\001-000_villalovoz es new shade structures\08 specifications\06 spec\04
final\villalovoz\10 1116_markerboards.docx
Last Updated: March 30, 2021*

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Code required signage.
 - 2. Exterior building identification and other non-code signage.

1.2 RELATED REQUIREMENTS

- A. Section 01 6116, Volatile Organic Compound (VOC) Restrictions; for VOC limits pertaining to adhesives, sealants, fillers, primers, and coatings.
- B. Section 01 8113, Sustainable Design Requirements, for CAL-Green general requirements and procedures.
- C. Division 26, Electrical.
- D. Signage requirements included on the Drawings.

1.3 REFERENCES AND STANDARDS

- A. California Building Code, edition as noted on the drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CAL Green), edition as noted on drawings, as adopted by the California Division of the State Architect (DSA).
- C. Title 19, CCR, Article 33.01(i).
- D. American National Standards Institute (ANSI):
 - 1. A-117.1: Accessible and Usable Buildings and Facilities.
- E. ASTM International (ASTM):
 - 1. A53/A53M: Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
 - 2. A153/A153M: Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Submittal Procedures:
 - 1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.

SIGNAGE
SECTION 10 1400
3595001

2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
3. Sustainable Design Submittals shall comply with the additional requirement of Section 01 8113, Sustainable Design Requirements.

B. Coordination:

1. Prior to production of shop drawings and samples, coordinate a pre-submittal conference with Architect to confirm submittal requirements, schedule, and sign review process.
2. For signs supported by or anchored to permanent construction, advise installers of anchorage devices about specific requirements for placement of anchorage devices and similar items to be used for attaching signs. Provide template for placement of sign-anchorage devices and electrical service embedded in permanent construction by other installers.

1.5 ACTION SUBMITTALS

A. Shop Drawings:

1. Scaled drawings and signage schedule for each sign indicating materials, lettering layout, and colors.
2. Large-scale drawing and details of custom logo and lettering. Include mounting details.
 - a. Include plans, elevations, and large-scale sections of typical members and other components.
 - b. Show mounting methods, grounds, mounting heights, layout, spacing, reinforcement, accessories, and installation details.
3. Font Style. 18 point graphical example of alphabet and numerical numbers 0 through 9 of signage font style, upper and lower case letters, punctuation, 18 point scale, and black text on white paper.

B. Product Data: Submit list and complete descriptive data of all products proposed for use. Include manufacturer's specifications, published warranty or guarantee, installation instructions, and maintenance instructions.

C. Samples:

1. Submit three samples of specified signage fonts to be used for visual and tactile characters including braille below the raised characters.
2. Color Verification: Provide physical sample of each available color from the manufacturer. Include color system name and serial number, code and name as applicable.
3. Control Samples. Samples shall be prepared on same base material to be used in fabrication. Submit one sample of each sign type. Signage types are indicated in Construction Document details. Interior signs shall be full size.

4. Dimensional Letters: One full-size representative samples of each dimensional letter type required, showing letter style, color, and material finish and method of attachment.
5. Symbol of Accessibility and Pictograms. Full scale sample of pictograms and symbol of accessibility to be used on sign panels and graphics.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For installer.
- B. Sustainable Design:
 1. General:
 - a. Submit information necessary to establish and document compliance with the California Green Building Standards Code.
 - b. Sustainable design submittals are in addition to other submittals.
 2. The following information shall be provided:
 - a. Adhesives and Sealants: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.
- C. Sample of manufacturer's warranty.
- D. Signage Schedule and Alphanumeric Nomenclature. As a component of shop drawings and informational submittals, verify with Architect the sign nomenclature; room names and numbers; wording of way-finding, directional and informational signage; text; and orientation of wayfinding pictorial graphics.

1.7 CLOSEOUT SUBMITTALS

- A. Warranty/Guarantee: Submit executed warranty and Subcontractor's guarantee.
- B. Maintenance data for signs and sign types including maintenance manuals.

1.8 QUALITY ASSURANCE

- A. Contractor shall assure that the vendor shall be responsible for the quality of materials and workmanship of any firm acting as the vendor's subcontractor.
- B. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.
- C. Use materials and products of one manufacturer whenever possible.
- D. Materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.
- E. The adhesion of inlaid letters and symbols will be tested. See Article WARRANTY.
- F. Mockups:

SIGNAGE
SECTION 10 1400
3595001

1. Prior to installation, provide a taping pattern for sign plaques.

1.9 DELIVERY, STORAGE AND HANDLING

- A. Deliver undamaged products to job in manufacturer's sealed containers and/or original bundles with tags and labels intact.
- B. Store materials in protected, dry conditions off of ground and in areas so as to not interfere with the progress of the work.
- C. Transport, store and handle in strict accord with the manufacturer's written recommendations.

1.10 FIELD MEASUREMENTS

- A. Make and be responsible for all field dimensions necessary for proper fitting and completion of work. Report discrepancies to Architect before proceeding.

1.11 WARRANTY

- A. Manufacturer: In addition to the Contractor's and Subcontractor's Guarantee, furnish Owner with manufacturer's available fully executed written warranty for signage against all defects in materials and workmanship, including without limitation against yellowing, cracking, crazing, and other visible and performance defects for a period of 5 years.
 1. Text, pictograms or symbols that can be removed from the sign face utilizing a sharp object or other conventional methods will be considered a manufacturing defect.

PART 2 - PRODUCTS

2.1 DESIGN AND PERFORMANCE CRITERIA

- A. Regulatory Standards:
 1. Except as otherwise specified or shown, signage shall conform to the following:
 - a. ANSI A-117.1 and the Americans with Disabilities Act (ADA).
 - b. ATBCB Design Guidelines for Signage in relation to the Americans with Disabilities Act.
 - c. California Code of Regulations, Titles 19 and 24.
 - 1) Contracted Grade 2 Braille shall be used whenever Braille symbols are specifically required. Refer to CBC Section 11B-703.3.
 - 2) All signage shall conform to 2019 CBC Section 11B-703.
 - d. Uniform Sign Code.
 2. When there is a conflict between the CBC and ADA, comply with the most stringent.
- B. Design Criteria: Refer to Chapter 11B of the California Building Code.

1. Raised Characters: Section 11B-703.2.
 - a. Depth: Section 11B-703.2.1.
 - b. Case: Section 11B-703.2.2.
 - c. Style: Section 11B-703.2.3.
 - d. Character Proportions: Section 11B703.2.4.
 - e. Character Height: Section 11B-703.2.5.
 - f. Stroke Thickness: Section 11B-703.2.6.
 - g. Character Spacing: Section 11B-703.2.7.
 - h. Line Spacing: Section 11B-703.2.8.
 - i. Installation Height and Location: Section 11B-703.4.
 2. Braille: Section 11B-703.3.
 - a. Contracted (Grade 2) Braille with rounded or domed dots shall be used wherever Braille is required.
 - 1) Braille dimensions in accordance with Table 11B-703.3.1.
 3. Visual Characters: Section 11B-703.5.
 - a. Character Proportions: Section 11B-703.5.4.
 - b. Stroke Thickness: Section 11B-703.5.7.
 - c. Character Spacing: Section 11B-703.5.8.
 - d. Line Spacing: Section 11B-703.5.9.
 4. Pictograms: Section 11B-703.6.
 - a. Pictogram Field: 11B-703.6.1.
 - 1) Characters and Braille shall not be located in the pictogram field.
 - b. Finish and Contrast: Section 11B-703.6.2.
 - 1) Pictograms and their field shall have a non-glare finish. Pictograms shall contrast with their field with either a light pictogram on a dark field or a dark pictogram on a light field.
 - c. Text Descriptors: Section 11B-703.6.3.
 - 1) Locate text descriptors directly below the pictogram field.
 - 2) Text shall be raised characters with braille directly below.
 5. International Symbol of Accessibility: Section 11B-703.7.2.1.
 6. Toilet Room Door Symbols: Section 11B-703.7.2.6.
 7. Tactile Exit Signs: Tactile exit signage to comply with 1013.4 and 11B-703.4.
- C. Sustainable Design:
1. VOC emissions for field-applied adhesives, sealants, and sealant primers must comply with limits specified in Section 01 6116.

2.2 PLASTIC SIGNS - TACTILE

- A. Materials, Unless Otherwise Noted:

SIGNAGE
SECTION 10 1400
3595001

1. Manufacturer and Product: "Inlaid Tactile Sign" by Accent Signage Systems, Inc. Minneapolis, MN, 800-215-9437 as specified and the basis of design; Ellis & Ellis Sign Systems, Sacramento, CA, 916-924-1936; ASI-Modulex, Los Altos, CA, 650-940-1354; Weidner Architectural Signage, Sacramento, CA; or equal.
 - a. Sign Face: Two 1/8-inch plies with eased edges; New Hermes "Gravo-Tac," or equal.
 - 1) Total Thickness: 1/4 inch.
 - 2) Painted signs will not be accepted.
 - b. Tactile Text: Provide tactile text and "Raster" Braille at plastic tactile signage.
 - 1) Tactile text shall be inlaid into sign face 1/32-inch and raised 1/32- inch minimum above sign face surface.
 - 2) Inlaid text shall be 1-ply, 1/16-inch thick material; "Gravo-Tac" Exterior or equal.
 - 3) Provide text and graphics precisely formed, uniformly opaque to comply with relevant ADA regulations and requirements indicated for size, style, spacing, content, position and colors.
 - 4) Symbols where specified shall be International Style.
 - 5) Braille shall be Contracted (Grade 2) Braille.
 - a) Dots shall be 0.10-inch on centers in each cell, 0.30-inch on center between corresponding dots in adjacent cells, and 0.395-inch minimum to 0.400-inch maximum on center between corresponding dots in cell directly below.
 - b) Dots shall be raised a minimum of 0.025-inch and a maximum of 0.037-inch above the background, and a base diameter of 0.059-inch minimum and 0.063- inch maximum.
 - c) Dots with straight sides and flat tops are not acceptable.
 - c. Colors: High contrast, non-glare, integral colors for graphics.
 - 1) Integral materials shall be U.V. stabilized.
 - 2) Characters, symbols and pictograms shall be in high contrast (light color) with background (dark) color and must conform to the CBC and the ADA Standards.

B. Fabrication:

1. Panel Appearance: Manufacturer's standard, high contrast, semi-matte colors.
2. Surface Texture: Matte Non-glare.
3. Character Style, Size and Layout Position:
 - a. Characters shall be 1-inch high, unless otherwise indicated.
 - b. The stroke of the uppercase letter "I" shall be 15 percent maximum of the height of the character.
 - c. The width of the uppercase letter "O" shall be 60 percent minimum and 110 percent maximum of the height of the uppercase letter "I".

SIGNAGE
SECTION 10 1400
3595001

- d. Character style to be Sans Serif, uppercase, accompanied by Braille directly below text at all locations where raised characters are required.
 - e. Spacing between baselines of separate lines of raised characters with a message shall be 135 percent minimum and 170 percent maximum of the raised character height.
 - 4. Text Schedule: Confirm text, symbols and numbering with the Architect and Owner.
 - 5. Sign Size: As indicated on the Drawings or, if not shown, as reasonably required to accommodate text, symbols and Braille.
 - a. Where signs are installed on window glazing, fabricate a blank sign back to match in size and shape to sign.
 - b. Sign backs shall cover back side of sign from view through window on opposite side of sign.
 - c. Signs that are mounted back-to-back on glazing are to be matching in size; the smaller sign is to be increased in size as reasonably required to match the larger sign.
 - 6. Sign Shape: As indicated on the Drawings.
 - a. Corners: Radiused, unless otherwise shown.
 - 7. Inlaid Letter Adhesion Process: Inlaid material shall be adhered into 1/32-inch deep routed sign face utilizing the heat and pressure bonded/chemically welded process as developed by Accent Signage Systems for the specified "Inlaid Tactile Sign."
 - a. Sign manufacturers for the specified "Inlaid Tactile Sign" shall be familiar with and utilize the exact same manufacturing process developed by Accent Signage Systems.
 - b. Manufacturer must utilize the same and required equipment, products and techniques necessary to produce authentic "Inlaid Tactile Signs" as developed by Accent Signage Systems.
 - c. Other adhesive products and methods, including applied adhesive tapes will not be accepted.
- C. Sign Types: Provide braille translation directly below the raised characters.
- 1. Room Identification Sign: Provide as shown on the Drawings.
 - a. Provide name and room number at each door indicated.
 - b. Names and numbers to be reviewed and approved by Architect and Owner prior to fabrication.
 - c. Allow an average of 4-numbers and 14-letters for each sign.
 - d. Sign to be provided adjacent to doors as shown.
 - 2. Toilet Room Identification Sign: In addition to the specified Door Symbol, provide a Toilet Room Identification Sign at the strike side of every toilet room door.
 - a. Sign shall include an International Symbol of Accessibility, pictogram, and raised characters, specifying the room name with Braille translation below pictogram.
 - 3. Tactile Exit Sign:

SIGNAGE
SECTION 10 1400
3595001

- a. Provide with text in raised characters to read: "EXIT".

2.3 PLASTIC SIGNS - NON-TACTILE

A. Materials, Unless Otherwise Noted:

Manufacturer and Product: Acrylic panel sign as manufactured and distributed by Ellis & Ellis Sign Systems, 916-924-1936, as specified and the basis of design, or equal.

1. Sign Face: 1/4-inch, matt finish, non-glare acrylic with subsurface vinyl and paint. Painted faces will not be accepted.
2. Colors: Colors shall match specified Tactile Signs and as selected by Architect and Owner.
 - a. Integral materials shall be U.V. stabilized.
 - b. Graphics and text shall be in high contrast (dark color) with background (light) color.

B. Fabrication:

1. Sign Thickness: 1/4-inch.
2. Character Style, Size and Layout Position:
 - a. Characters shall be a minimum of 1-inch high, unless otherwise indicated.
 - b. The stroke thickness of the uppercase letter "I" shall be 10 percent minimum and 20 percent maximum of the height of the character.
 - c. The width of the uppercase letter "O" shall be 60 percent minimum and 110 percent maximum of the height of the uppercase letter "I".
 - d. Letter style to be Sans Serif, uppercase.
 - e. Space characters 10 percent minimum and 35 percent maximum of height of characters, measured between two closest points of adjacent characters, excluding word spaces.
 - f. Spacing between baselines of separate lines of characters within a message shall be 135 percent minimum and 170 percent maximum of character height.
3. Text Schedule: Confirm text, symbols and numbering Architect and Owner using the shop drawing/submittal process.
4. Sign Size: As indicated on the Drawings or, if not shown, as reasonably required to accommodate text and symbols.
 - a. Where signs are installed on window glazing, fabricate a blank sign back to match in size and shape to sign.
 - b. Sign backs will cover back side of sign from view through window on opposite side of sign.
5. Sign Shape: As indicated on the Drawings or, as reasonably required to accommodate the specified text and size at lettering.
 - a. Corners: 1/4-inch radius, unless otherwise shown.

C. Sign Types:

1. Toilet Room Door Symbol: Provide one of the following symbols as appropriate to the toilet room type. Toilet Room Door Symbols shall have a color contrast that is distinctly different from the color of the door. Characters, as shown, to be flush with face of symbol. The entire background color must contrast with door. A thin contrasting border around the symbol, with remainder of sign background in a non-contrasting color is not allowed.
 - a. Girls: 12-inch diameter circle, with eased edges.
 - b. Boys: Equilateral triangle with sides 12-inches long, with eased edges.
 - c. Women: 12-inch diameter circle, with eased edges.
 - d. Men: Equilateral triangle with sides 12-inches long, with eased edges.
 - e. Unisex or Staff: equilateral triangle of contrasting color and super imposed on and geometrically inscribed within the face of 12-inch diameter circle, which is a contrasting color to the door. The vertices of the triangle symbol shall be located ¼-inch maximum from the edge of the circle with the vertex pointing upward. Both the circle and triangle to have eased edges.
2. Occupancy Signs (Capacity Sign): Quantity of occupants shall be as indicated on the Drawings or as provided by Architect. Text to read as follows:
 - a. Maximum Number - General: "The number of people permitted in this room shall not exceed _____ by order of the Division of the State Architect."
 - b. Rooms Used for Assembly and Dining: "The number of people permitted in this room shall not exceed _____ for Assembly and _____ for Dining by order of the Division of the State Architect."
3. Assistive Listening System Sign: Provide as indicated on the Drawings.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Prior to installation, carefully inspect and verify that the installed work of other trades is complete to the point where this installation may properly commence.
- B. Verify that specified items may be installed in accordance with the approved design.
- C. In the event of discrepancy, immediately notify Architect. Do not proceed in discrepant areas until discrepancies have been fully resolved.

3.2 INSTALLATION OF SIGNS

- A. General: Locations of signs must be in accordance with the Drawings and approved shop drawings.
- B. Plastic Signs:
 1. General:
 - a. Provide both mechanical fasteners and either adhesive or 2-sided adhesive tape as recommended by manufacturer for given mounting substrate.

SIGNAGE
SECTION 10 1400
3595001

- b. Fasteners: Minimum 4-recessed flush head tamper-proof (vandal-resistant) screws per sign.
- 2. Wood and Metal Framed Walls: Mechanical fasteners shall be of adequate length to penetrate exterior finishes and provide secure embedment into wall structure or sheathing.
- 3. Concrete Walls:
 - a. Use vinyl tape and mounting holes for countersunk, vandal-proof expansion anchors (use both).
- 4. Glass:
 - a. Utilize mounting adhesive and silicone where signs are mounted to glass.
 - b. Provide vinyl window sign backer to match sign face size, mounted on opposite side of glass.
 - c. Signs mounted back-to-back are to be matching in size.
 - d. Do not pre-drill signs for mechanical fastening where sign is to be mounted to glass.
- C. Other Signs: Use mounting method that is permanent, vandal resistant, and has been approved by the Architect.

3.3 PROTECTION

- A. Protect work and materials of this Section and other Sections prior to and during installation, and protect the installed work and materials of all other trades.
- B. In the event of damage, immediately make all repairs and replacements necessary to the approval of the Architect and at no additional cost to the Owner.

3.4 ADJUSTING AND CLEANING

- A. Remove all dust, dirt, finger marks, etc. from signs and letters using cleaning methods as recommended by manufacturer.

END OF SECTION

p:\sacramento\3595 tracy unified school district\001-000_villalovoz es new shade structures\08 specifications\06 spec\04 final\ villalovoz\10 1400_ signage.docx
Last Updated: March 30, 2021

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Toilet accessories.

1.2 RELATED REQUIREMENTS

- A. Division 26, Electrical.

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CAL Green), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Submittal Procedures:
 - 1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
 - 2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
- B. Coordination: Coordinate with other trades as required to ensure proper and adequate provision in framing and wall finish for the installation of the selected toilet accessories in the locations required including recessed items)

1.5 ACTION SUBMITTALS

- A. Shop Drawings: Submit showing parts, connections and anchorages, adjacent materials, fully dimensioned and noted.
- B. Product Data: Submit list of each required accessory and complete descriptive data of products proposed for use. Include manufacturer's specifications, published warranty, installation instructions, and maintenance instructions.

1.6 INFORMATIONAL SUBMITTALS

- A. Sample of manufacturer's warranty.

1.7 CLOSEOUT SUBMITTALS

- A. Warranty/Guarantee: Submit executed warranty and Subcontractor's guarantee.

TOILET ACCESSORIES
SECTION 10 2813
3595001

- B. Keys for lockable accessories.
- C. Maintenance data and operating instructions.

1.8 QUALITY ASSURANCE

- A. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.
- B. Use materials and products of one manufacturer whenever possible.
- C. All materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.

1.9 DELIVERY, STORAGE AND HANDLING

- A. Deliver undamaged products to job in manufacturer's sealed containers and/or original bundles with tags and labels intact.
- B. Store materials in protected, dry conditions off of ground and in areas so as to not interfere with the progress of the Work.
- C. Transport, store and handle in strict accord with the manufacturer's written recommendations.

1.10 FIELD CONDITIONS

- A. Make and be responsible for field dimensions necessary for proper fitting and completion of Work. Report discrepancies to Architect before proceeding.
- B. Verify wall depths are adequate for each item prior to ordering. Notify Architect of conflicts or discrepancies.

1.11 WARRANTY

- A. Manufacturer: In addition to the Contractor's and Subcontractor's Guarantee, furnish Owner with manufacturer's fully executed written warranty for toilet accessories against defects in materials and workmanship, agreeing to replace and install toilet accessories at no additional cost to the Owner, within warranty period as follows:
 - 1. For a period of 3 years.

PART 2 - PRODUCTS

2.1 OWNER FURNISHED CONTRACTOR INSTALLED PRODUCTS

- A. The following products will be furnished by the Owner for installation by Contractor. Provide adequate blocking for attachment. Miscellaneous items are to be provided and installed by Contractor.

1. Toilet Tissue Dispensers.

2.2 DESIGN AND PERFORMANCE CRITERIA

- A. Conform to applicable requirements of ADA and CBC for accessibility. When in conflict, conform to the most stringent.

2.3 MANUFACTURERS

- A. Accessories: Bobrick Washroom Equipment Inc. or Bradley Corporation as specified and the basis of design, unless otherwise noted, or equal.
 1. Manufactured accessories not specified shall require approval as a substitution to be considered equal. Refer to substitution requirements specified in Section 01 3300, Submittal Procedures.
 2. Although multiple manufacturers may be specified for a specific accessory, all accessories shall be the product of a single manufacturer, unless otherwise specified or approved.

2.4 MANUFACTURED UNITS

- A. Grab Bars: 18 gauge 1-1/2 inch outside diameter, type 304 stainless steel welded to 1/8 inch type 304 solid stainless steel wall plates; Bobrick Series B-6806, Bradley 812 Series, or equal.
 1. Configurations and Lengths: As shown.
 2. Grab bar shall withstand a 250 pound point load.
 3. Joints ground and polished.
 4. Finish on Exposed Surfaces: Satin.
 5. Fastening: Concealed, vandal resistant.

2.5 FASTENINGS

- A. Toilet accessories shall be complete with required fastenings.
- B. Fastenings shall either harmonize with the item being fastened, or be of the concealed type.
- C. Exposed fastenings shall be theft and vandal-resistant.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Prior to installation of the Work of this Section, carefully inspect and verify that the installed Work of other trades is complete to the point where this installation may properly commence.
- B. Verify that specified items may be installed in accordance with the approved design.

TOILET ACCESSORIES
SECTION 10 2813
3595001

- C. In the event of discrepancy, immediately notify the Architect. Do not proceed in discrepant areas until discrepancies have been fully resolved.

3.2 PREPARATION

- A. The Contractor shall provide recesses, anchorage and back-up blocking in sizes and in locations as required for proper installation of accessories. Coordinate with other trades where necessary to make provisions for installation.
- B. Securely anchor items in place in locations and at mounting heights indicated. Where specific dimensions are not noted, installation shall be approved by the Architect.
- C. Securely fasten grab bar mounting plates to solid framing or blocking, in accordance with CBC.
- D. Provide cut-outs in toilet partitions for napkin disposal units as required.

3.3 INSTALLATION

- A. Install fixtures, accessories and items in accordance with manufacturers' printed instructions and requirements in the 2019 CBC 11B-603.5 where shown or as approved by Architect.
- B. Mount surface-mounted accessories to solid backing or blocking.
- C. Install plumb and level, securely and rigidly anchored to substrate.
- D. Use concealed vandal-resistant fastenings wherever possible.
 - 1. Adhesive installation not permitted.
 - 2. Provide anchors, bolts and other necessary fasteners, and attach accessories securely to walls or toilet partitions as recommended by manufacturer for each item and each type of substrate condition.
- E. Grab bars: Solidly anchor grab bars to withstand minimum downward pull of 500 pounds between any 2 supports after installation.
- F. Verify type, location and attachment methods of items furnished by Owner to ensure proper preparation of substrate for solid attachment of accessories.
- G. Sealants: Comply with requirements of Section 07 9200, Joint Sealants.
 - 1. Apply behind toilet accessories as necessary to ensure sanitary and watertight integrity of surfaces.
 - 2. Conceal sealants.

3.4 CLEANING AND ADJUSTING

- A. Upon completion of installation, remove manufacturer's temporary labels, marks of identification.
- B. Thoroughly wash surfaces, remove foreign materials, polish surfaces.

TOILET ACCESSORIES
SECTION 10 2813
3595001

- C. Leave entire accessories in neat, orderly, clean, acceptable condition as approved.
- D. Replace damaged parts, surfaces which are not free from imperfections.

3.5 PROTECTION

- A. Protect Work and materials of this Section prior to and during installation, and protect the installed Work and materials of other trades.
- B. In the event of damage, make repairs and replacements necessary to the approval of the Architect at no additional cost to the Owner.
- C. Exposed finish shall be free from scratches, dents, permanent discolorations and other defects in workmanship or material.

END OF SECTION

*p:\sacramento\3595 tracy unified school district\001-000_villalovoz es new shade structures\08 specifications\06 spec\04
final\villalovoz\10 2813_toilet accessories.docx
Last Updated: April 1, 2021*

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Fire extinguishers, hangers and cabinets.
 - 2. Fire hose and extinguisher cabinet.

1.2 RELATED REQUIREMENTS

- A. Section 09 9100, Painting.

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CAL Green), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Submittal Procedures:
 - 1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
 - 2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.

1.5 ACTION SUBMITTALS

- A. Shop Drawings: Submit showing all parts, connections and anchorages, adjacent materials, fully dimensioned and noted. Include in-wall blocking requirements.
- B. Product Data: Submit list and complete descriptive data of all products proposed for use. Include manufacturer's specifications and installation instructions.

1.6 INFORMATIONAL SUBMITTALS

- A. Statement that all extinguishers and cabinets comply with the current applicable UL and NFPA classifications and ratings.
- B. Sample of manufacturer's warranty.

1.7 CLOSEOUT SUBMITTALS

- A. Written instructions to Owner's personnel in the operation, maintenance and charging of the fire extinguishers furnished.

FIRE EXTINGUISHERS AND CABINETS
SECTION 10 4416
3595001

- B. Warranty/Guarantee: Submit executed warranty and subcontractor's guarantee.

1.8 QUALITY ASSURANCE

- A. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.
- B. Single-Source Responsibility: Use materials and products of one manufacturer.
- C. Materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.
- D. Equipment shall be approved by Underwriters' Laboratories, Inc., bear UL Label and be approved by the State Fire Marshal.

1.9 DELIVERY, STORAGE AND HANDLING

- A. Deliver undamaged products to job in manufacturer's sealed containers and/or original bundles with tags and labels intact.
- B. Store materials in protected, dry conditions off of ground and in areas so as to not interfere with the progress of the work.
- C. Transport, store and handle in strict accord with the manufacturer's written recommendations.

1.10 FIELD MEASUREMENTS

- A. Make and be responsible for all field dimensions necessary for proper fitting and completion of work. Report discrepancies to Architect before proceeding.

1.11 WARRANTY

- A. Manufacturer: In addition to the Contractor's and Subcontractor's Standard Guarantee, furnish Owner with manufacturer's fully executed written warranty for fire extinguishers against defects in materials and workmanship for a period of not less than 5 years.

PART 2 - PRODUCTS

2.1 DESIGN AND PERFORMANCE CRITERIA

- A. Conform to all applicable standards of the National Fire Protection Association (NFPA) and California State Fire Marshal (CSFM) for fire extinguisher cabinets and locations.

2.2 FIRE EXTINGUISHERS

- A. Manufacturer: By same manufacturer as fire extinguisher cabinets.
- B. Types:

FIRE EXTINGUISHERS AND CABINETS
SECTION 10 4416
3595001

1. Fire extinguishers - General Use: UL Rating 3A-40BC extinguishers shall be 5-pound nominal capacity multi-purpose dry chemical type, bearing U.L. Label; finish shall be red enameled steel.
- C. Tamperseals on each extinguisher shall be of the breakable metal type, indicating accidental or unauthorized partial discharge.
- D. Pressure gauges on each extinguisher shall be of the dial type.
- E. Mounting Brackets:
 1. Manufacturer: Provide brackets from same manufacturer as fire extinguisher.
 2. Brackets shall be of quick release design, not subject to release by bumping.
 3. Bracket attachments shall be furnished with each bracket, suitable for the surface to which attachment is to be made.

2.3 FIRE EXTINGUISHER CABINETS

- A. General:
 1. Size cabinets to conform to size and number of extinguishers at each location shown on the Drawings.
- B. Manufacturer and Product: "Cosmopolitan" Series by JL Industries, Inc., a division of the Activar Construction Products Group as specified, or equal.
 1. Mounting:
 - a. Type 1: Semi-recessed with 2-1/2 inch return trim, rolled edge, for 3A-40BC fire extinguisher.
 - b. Type 3: Fully-recessed with 3/8 inch flat trim, depth as required.
 2. Door Style: S21 solid with black ABS flush (recessed) pull and continuous hinge.
 3. Latching Device: Manufacturer's standard roller catch.
 4. Finishes:
 - a. Door and Trim: Stainless steel, #4 satin finish.
 - b. Cabinet Box (Tub): Manufacturer's standard white electrostatic powder coat.
 5. Provide mounting clips, suitable for extinguishers being provided, in each cabinet.
 6. Identification: "FIRE EXTINGUISHER" in vertical red color lettering.
 7. Cabinet shall be fabricated to meet ADA and CBC projection criteria.
 8. Welded anchors to be provided appropriate to construction in which cabinet is placed.
 9. Cabinets located in fire rated walls to be "Cosmopolitan Fire FX" Option.

FIRE EXTINGUISHERS AND CABINETS
SECTION 10 4416
3595001

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Prior to installation of work of this Section, carefully inspect and verify that the installed work of all other trades is complete to the point where this installation may properly commence.
- B. Verify that specified items may be installed in accordance with the approved design.
- C. In the event of discrepancy, immediately notify Architect. Do not proceed in discrepant areas until discrepancies have been fully resolved.

3.2 PROTECTION

- A. Protect work and materials of this Section and other Sections prior to and during installation, and protect the installed work and materials of other trades.
- B. In the event of damage, immediately make all repairs and replacements necessary to the approval of the Architect and at no additional cost to the Owner.

3.3 INSTALLATION

- A. Install cabinets and extinguishers where indicated on the Drawings and as required by the local Fire Authority. Where exact location of cabinets is not indicated, locate as directed by Architect.
- B. Install cabinets in accordance with manufacturer's instructions and approved shop drawings.
- C. Install so that handle of extinguisher meets accessibility requirements.
- D. Prepare recesses in walls for cabinets as required by type and size of cabinet and style of trim and to comply with manufacturer's instructions. Provide blocking, backing and other materials necessary for proper attachment and fire rating.
- E. Anchor cabinets and brackets securely in place.
- F. Provide fire extinguisher in each fire extinguisher cabinet.

3.4 INSTALLATION OF FIRE EXTINGUISHERS

- A. Determine approximate completion date of work and then inspect, charge, and tag fire extinguishers not more than 10 calendar days before nor less than one day before actual completion of work.
- B. The installation of the specified fire extinguishers in no way relieves the Contractor from providing adequate fire protection during the course of this work.

FIRE EXTINGUISHERS AND CABINETS
SECTION 10 4416
3595001

END OF SECTION

*p:\sacramento\3595 tracy unified school district\001-000_villalovoz es new shade structures\08 specifications\06 spec\04
final\villalovoz\10 4416_fire extinguishers and cabinets.docx
Last Updated: September 24, 2021*

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Manual-operated horizontal louver blinds.

1.2 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CAL Green), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- C. National Fire Protection Association (NFPA):
 - 1. 701: Standard Methods of Fire Tests for Flame Propagation of Textiles and Films.
- D. California Administrative Code:
 - 1. Title 19: Public Safety.

1.3 ADMINISTRATIVE REQUIREMENTS

- A. Submittal Procedures:
 - 1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
 - 2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Contract Closeout and Final Cleaning.

1.4 ACTION SUBMITTALS

- A. Shop Drawings: Submit showing parts, connections and anchorages, adjacent materials, fully dimensioned and noted.
- B. Product Data: Submit list and complete descriptive data of products proposed for use. Include Manufacturer's specifications, published warranty or guarantee, installation instructions, and maintenance instructions.
- C. Samples: The following samples are required.
 - 1. Manufacturer's full range of colors for Architect's selection.

1.5 INFORMATIONAL SUBMITTALS

- A. Sample of manufacturer's warranty.

HORIZONTAL LOUVER BLINDS
SECTION 12 2113
3595001

1.6 CLOSEOUT SUBMITTALS

- A. Warranty/Guarantee: Submit executed warranty and Subcontractor's guarantee.

1.7 QUALITY ASSURANCE

- A. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.
- B. Use materials and products of one Manufacturer whenever possible.
- C. Materials, components, assemblies, workmanship and installation are to be observed by the Owner's Inspector of Record. Work not so inspected is subject to uncovering and replacement.
- D. Flame-resistant materials shall pass or exceed one of more of the following:
 - 1. National Fire Protection Association (NFPA) 701.
 - 2. California Administrative Code Title 19.

1.8 DELIVERY, STORAGE AND HANDLING

- A. Deliver undamaged products to job in Manufacturer's sealed containers and/or original bundles with tags and labels intact.
- B. Store materials in protected, dry conditions off of ground and in areas so as to not interfere with the progress of the Work.
- C. Transport, store and handle in strict accord with the manufacturer's written recommendations.

1.9 FIELD CONDITIONS

- A. Verify field measurements for openings to receive vertical blinds allowing proper clearances as recommended by Manufacturer to allow free rotation and traversing.
- B. Prior to shade installation, building shall be enclosed.
- C. Interior temperature shall be maintained between 60 degrees F and 90 degrees F during and after installation; relative humidity shall not exceed 80 percent. Wet work shall be complete and dry.

1.10 WARRANTY

- A. Manufacturer: In addition to the Contractor's and Subcontractor's Guarantee, furnish Owner with manufacturer's fully executed written limited lifetime warranty for the repair or replacement of horizontal louver blinds against defects in materials and workmanship.

PART 2 - PRODUCTS

2.1 PRODUCTS

- A. Model "CD80 1 Mini Aluminum Blind" as manufactured by Hunter Douglas Contract, or equal.

2.2 MATERIALS

- A. Slats: Aluminum alloy, 1 inch wide by .008 inch thick, heat-treated and spring tempered aluminum alloy 6011, with eased corners and manufacturing burrs removed. Furnish not less than nominal 15.2 slats per foot to ensure tight closure and light control.
- B. Slat Support: Braided ladders of 100 percent polyester yarn color compatible with slats and spacing of ladder no more than 20mm, reinforced to withstand 100 pound pull. Distance between ladders not to exceed Manufacturer's requirements.
- C. Headrail: U-shaped profile with rolled edges, measuring 1-3/8 inches x 1-3/8 inches x 0.024 inch constructed of corrosion-resistant steel, providing a beveled edge valance-free design. Ends to be fitted with 0.024 inch steel end lock with adjustable tab for centering blinds. Finish to be standard baked-on polyester and to match slats.
- D. Bottom Rail: Steel with corrosion-resistant finish formed with double-lock seam into closed oval shape for optimum beam and torsional strength. Ends fitted with color-coordinated engineered polymer caps. Finish to be standard baked-on polyester and to match slats.
- E. Lifting Mechanism: Crashproof steel cordlocks with corrosion-resistant finish, two-ply polyester cord filler in braided polyester jacket lift cords, cord equalizers, cordlock adapter, and cord stop / single pull cord. Install within 2019 CBC reach ranges 11B-308.
- F. Tilting Mechanism: Permanently lubricated die-cast worm and gear type tilter gear mechanism in fully enclosed housing with clutch action to protect ladder tapes from over rotation of the solid steel, corrosion resistant tilt rod.
- G. Tilt Control Wand: Tubular shaped 7/16 inch diameter extruded clear plastic, ribbed for positive grip and detachable without tools.
- H. Mounting Hardware: Manufacturer's standard as required for the type of installation shown.
- I. Hold-Down Brackets: Provide metal hold down brackets where blinds are to be mounted on doors.

2.3 FINISHES

- A. Aluminum: Manufacturer's standard baked-on finish in colors selected by Architect from manufacturer's available contract colors utilizing "Dust Shield" finish to inhibit dust build-up for easier maintenance.
- B. Cord and braided ladders shall be color coordinated with slat.

HORIZONTAL LOUVER BLINDS
SECTION 12 2113
3595001

2.4 FABRICATION

- A. Blind measurements shall be accurate to within plus or minus 1/8 inch or as recommended in writing by the manufacturer for the specific installation conditions.
- B. Hardware shall be enclosed in a metal head. Operating hardware shall be machine clinched to head to assure perfect alignment. Slats shall tilt to any angle by turning a transparent wand. Blinds shall fit within the window openings as detailed, unless otherwise indicated.
- C. Other materials and components not specifically described, but required for a complete and proper installation of horizontal window blinds, shall be selected by the Installer, subject to approval of the Architect. Do not intermix component parts of various manufacturers in assembled units.
- D. Prior to fabrication, verify cords and tilt devices will be accessible and operational from the floor and will not conflict with cabinets, doors, fixtures or other items. Locate on either end as directed or approved. Bring potential conflicts to Architect's attention for resolution prior to start of Work.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Prior to installation, carefully inspect and verify that the installed Work of other trades is complete to the point where this installation may properly commence.
- B. Verify that specified items may be installed in accordance with approved design.
- C. In the event of discrepancy, immediately notify the Architect. Do not proceed in discrepant areas until discrepancies have been fully resolved.

3.2 INSTALLATION

- A. Install horizontal window blinds level and true, in accordance with the Drawings and the manufacturer's recommended procedures.
- B. Blinds shall be installed inside mount, unless otherwise indicated. Consult with Architect where inside mount may not be possible.
- C. Provide 1-1/2 inch overlap at each jamb where face installations are indicated or approved.
- D. Divisions between blinds, where required, shall occur only at mullions.
- E. Install intermediate support brackets and extension brackets as needed to prevent deflection in headrail.

3.3 CLEANING AND ADJUSTING

- A. Test operation of horizontal window blind hardware before and after installation. Operation shall be smooth and uniform.
- B. Upon completion of installation, remove manufacturer's temporary labels, marks of identification. Thoroughly wash surfaces and remove foreign material. Leave entire Work in neat, orderly, clean and acceptable condition as approved. Replace damaged parts and surfaces which are not free from imperfections.
- C. Finish installation free of dirt and finger marks. Leave work area clean and free of debris.

3.4 PROTECTION

- A. Protect Work and materials of this Section prior to and during installation, and protect the installed Work and materials of other trades.
- B. In the event of damage, make repairs and replacements necessary to the approval of the Architect at no additional cost to the Owner.
- C. Exposed finishes shall be free from scratches, dents, permanent discolorations and other defects in workmanship or material.

END OF SECTION

*p:\sacramento\3595 tracy unified school district\001-000_villalovo es new shade structures\08 specifications\06 spec\04
final\villalovo\12 2113_horizontal louver blinds.docx
Last Updated: April 2, 2021*

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Manufactured, plastic-laminate-faced, modular casework and accessory items.

1.2 RELATED REQUIREMENTS

- A. Section 01 6116, Volatile Organic Compound (VOC) Content Restrictions, for VOC limits pertaining to adhesives, sealants, fillers, primers, and coatings.
- B. Section 01 8113, Sustainable Design Requirements, for CAL-Green general
- C. Section 06 4023, Interior Architectural Woodwork.
- D. Section 09 2900, Gypsum Board.
- E. Section 09 9100, Painting.
- F. Section 12 3623, Plastic-Laminate-Clad Countertops.
- G. Division 26, Electrical, for electrical outlets and fittings built into architectural casework.

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as note on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CALGreen), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- C. American National Standards Institute (ANSI):
 - 1. ANSI A208.2: Medium Density Fiberboard for Interior Use.
 - 2. ANSI/BHMA A156.9: American National Standard for Cabinet Hardware; Builders Hardware Manufacturers Association.
 - 3. ANSI/BHMA A156.18: American National Standard for Materials and Finishes; Builders Hardware Manufacturers Association.
- D. National Electrical Manufacturers Association (NEMA):
 - 1. NEMA LD3.1: "High-Pressure Decorative Laminates."
- E. Woodwork Institute (WI)/ Architectural Woodwork Manufacturers of Canada (AWMAC):
 - 1. North American Architectural Woodwork Standards (NAAWS).

MANUFACTURED PLASTIC-LAMINATE-CLAD CASEWORK
SECTION 12 3216
3595001

1.4 DEFINITIONS

- A. General: The following definitions are in conformance with those included in the referenced NAAWS document.
- B. "Exposed Exterior" surfaces include all surfaces visible when doors and drawers are closed.
 - 1. Bottoms of casework more than 4 feet above the floor will be considered an exposed surface.
 - 2. Tops of casework that are visible by building occupants from stairs, mezzanines or other elevated locations will be considered as exposed.
- C. "Exposed Interior Surfaces" surfaces exposed to view in open casework or behind glass doors.
- D. "Semi-Exposed Surfaces" are interior surfaces only exposed to view when doors or drawers are open.
- E. "Concealed Surfaces" include surfaces of sleepers, web frames, dust panels, and other surfaces that are not visible after installation.

1.5 ADMINISTRATIVE REQUIREMENTS

- A. Submittal Procedures:
 - 1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
 - 2. Sustainable Design Submittals shall comply with the additional requirement of Section 01 8113, Sustainable Design Requirements.
 - 3. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
- B. Scheduling and Coordination:
 - 1. Require casework fabricator to examine the schedule and check it for timing, accuracy and compatibility with its work and shall coordinate work with the master schedule and job superintendent.
 - 2. Require casework fabricator to furnish assistance in coordination and scheduling of other work pertinent to casework installation and to notify Contractor of requirements so as to result in a well-coordinated job.

1.6 ACTION SUBMITTALS

- A. Shop Drawings:
 - 1. Submit dimensioned plans, elevations, component profiles, and details for each casework layout showing the following:
 - a. Locations and type of service fixtures with lines thereto; anchorage locations, installation details to floors and walls.

MANUFACTURED PLASTIC-LAMINATE-CLAD CASEWORK
SECTION 12 3216
3595001

- b. Relationship of units in to surrounding and adjacent construction including walls, doors, and windows.
 - c. Swing of doors.
 - d. Shelving.
 - e. Accessory items such as fillers, end panels, and valance.
 - f. Base height.
 - 2. First page of shop drawings and each elevation shall bear an individually serial-numbered WI "Certified Compliance Label."
- B. Product Data:
- 1. Provide manufacturers cut sheets for all materials proposed for use including:
 - a. Panel products.
 - b. Cabinet hardware items.
 - c. Laminates.
 - 2. Include manufacturer's literature for items which are proposed for use and specified herein only by listing the intended performance requirements.
- C. Samples: The following samples are required.
- 1. Each type of high pressure laminate (HPL), edge banding, cabinet liner, and melamine-faced panel.
 - a. Plastic laminate and edge banding to be selected from manufacturers' full range of colors by Architect.
 - 2. Hardware: Adjustable shelf clip, hinge, pull, magnetic catch, elbow catch and lockset. Returned hardware samples may be used on the project unless otherwise noted by the Architect.

1.7 INFORMATIONAL SUBMITTALS

- A. Before delivery of casework to jobsite, submit a WI "Certified Compliance Certificate" listing the items certified, the applicable NAAWS Grade, and whether installation is included.
- B. Qualification Data: For installer.
- C. Sample of manufacturers' warranty.
- D. Sustainable Design:
 - 1. General:
 - a. Submit information necessary to establish and document compliance with the California Green Building Standards Code.
 - b. Sustainable design submittals are in addition to other submittals.
 - 2. The following information shall be provided:
 - a. Composite Wood: Evidence of compliance that products meet formaldehyde limits of current CARB Airborne Toxic Control Measure (ATCM) as specified in Section 01 6116.

MANUFACTURED PLASTIC-LAMINATE-CLAD CASEWORK
SECTION 12 3216
3595001

- b. Adhesives and Sealants: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.

1.8 CLOSEOUT SUBMITTALS

- A. Warranty: Submit executed warranty.
- B. **[Specified maintenance materials]**

1.9 MAINTENANCE MATERIAL SUBMITTALS

- A. Provide additional materials as follows:
 - 1. Hinges: 10 each.
 - 2. Pulls: 10 each.
 - 3. Cabinet Locks: 10 each.
 - 4. Adjustable Shelf Supports: 25 each.
- B. Deliver to Owner as directed.

1.10 QUALITY ASSURANCE

- A. General:
 - 1. Furnish all components and accessories and all allied products new and free from defects.
 - 2. To assure proper coordination and eliminate divided responsibility, all work specified in this Section shall be executed under the direction of a single manufacturer and supplier.
- B. Qualifications:
 - 1. Manufacturer: The casework manufacturer must have not less than 5 years of production experience similar to this project, and the specified product, and whose qualifications indicate the ability to comply with the requirements of this section.
 - 2. Installer: The installer must have at least one project in the past 5 years with similar systems and complexities to those required for this project, and where the value of the woodwork is a minimum of 80% of the cost of woodwork for this project.
- C. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.
- D. Single-Source Responsibility: Use materials and products of one manufacturer whenever possible.
- E. Materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.
- F. Casework Designations:

MANUFACTURED PLASTIC-LAMINATE-CLAD CASEWORK
SECTION 12 3216
3595001

1. Reference numbers on Drawings are related to NAAWS Cabinet Design Series (CDS) Elevation numbers, and are used to identify prefinished casework and to indicate dimensions, general design, equipment, shelving (adjustable and fixed) and other components to be furnished. Unless modified by notation on Drawings, description for indicated number shall constitute requirements for such cabinets incorporating all features set forth in the NAAWS CDS Elevations.
 2. Use of the NAAWS CDS Elevations numbers, and specific requirements set forth on the Drawings and as specified, are not intended to preclude use of other manufacturer's product or procedure, which may be equal thereto, but are given to establish standard of design and quality of materials, construction and workmanship.
- G. Proof of compliance with the specified NAAWS Grade assembly and installation shall be provided by the following WI Quality Control Program:
1. WI Monitored Compliance Program.
 - a. All casework and the installation thereof for this project shall be directly monitored for compliance to the Contract by the Woodwork Institute under the scope of their Monitored Compliance Program (MCP).
 - 1) Inspections are to be performed at the beginning of fabrication, at the time of delivery to the job, at the beginning of installation, at completion of installation.
 - 2) Further information on the WI Monitored Compliance Program's Policies and Procedures are available directly from the Woodwork Institute, 916-372-9943.
 - 3) The WI MCP Registration Number shall be referenced in all communication.
 - b. Fees charged by the Woodwork Institute for their monitored compliance service are the responsibility of the Contractor and shall be included in the Contract sum.
 - c. Casework and/or installation determined to be non-compliant by WI and not corrected will be rejected.
 - d. Issuance of the WI Monitored Compliance Certificate is a prerequisite of the Owner's final acceptance.
- H. Mockups: Provide mockup of one base cabinet and one wall hung cabinet to verify finish material selections, modifications made under sample submittals, and to demonstrate aesthetic effects and set quality standards for materials and execution for cabinet exteriors, interior construction, and hardware.
1. The base cabinet is to have at least one drawer and be of the same material to be provided for the project.
 2. The approved mockup may be incorporated in the project.
- 1.11 DELIVERY, STORAGE AND HANDLING**
- A. Deliver undamaged products to job in manufacturer's sealed containers and/or original bundles with tags and labels intact.

MANUFACTURED PLASTIC-LAMINATE-CLAD CASEWORK

SECTION 12 3216

3595001

- B. Store materials in protected, dry conditions off of ground and in areas so as to not interfere with the progress of the work.
- C. Transport, store and handle in strict accordance with the manufacturer's recommendations.
- D. Do not deliver until wet operations in building are completed and storage area is closed in and broom clean, with relative humidity 50 percent or less at 70 degrees F.
- E. Deliver in sections to fit through openings.

1.12 FIELD CONDITIONS

- A. Environmental Limitations: Do not deliver or install casework until building is enclosed, wet-work is complete, and HVAC system is operating and maintaining temperature and relative humidity at levels planned for building occupants during the remainder of the construction period.
- B. Products shall be available at project when required for installation so as not to delay job progress. Installer for these products shall cooperate with installers performing work under other sections involved to effect proper installation.
- C. Casework fabricator shall coordinate installation of any Owner supplied equipment where indicated on the Drawings.
- D. Field Measurements: Make and be responsible for all field dimensions necessary for proper fitting and completion of work. Report discrepancies to Architect before proceeding.

1.13 WARRANTY

- A. Manufacturer: In addition to the Contractor's Standard Guarantee, furnish Owner with manufacturer's fully executed written 5-year warranty for casework against defects in materials and workmanship. Warranty shall include against delaminations, joint separations, warp or twist in doors more than 1/4 inch, and splits or cracks in finished surfaces.

PART 2 - PRODUCTS

2.1 DESIGN AND PERFORMANCE CRITERIA

- A. Sustainable Design:
 - 1. Composite wood products must meet current formaldehyde emission limits of CARB Airborne Toxic Control Measure (ATCM) as specified in Section 01 6116.
 - 2. VOC emissions for field-applied adhesives, sealants, and sealant primers must comply with limits specified in Section 01 6116.

2.2 PANEL MATERIALS

- A. Medium-Density Fiberboard (MDF): ANSI A208.2, Grade 155, formaldehyde-free, and meeting grade MR30 moisture resistance; "Medite II," by Roseburg, or equal.
 - 1. Thickness: 3/4 inch, unless otherwise shown or specified.
- B. Thermally-Fused Melamine Panels (TFM): Melamine resin-impregnated decorative paper thermally fused to a formaldehyde free MDF core.
 - 1. Color: White, unless otherwise noted or selected by Architect from a minimum of 6 colors.
- C. Plywood: Exterior type, Grade B-C or better. Plywood to be free of urea-formaldehyde.
- D. Hardboard: Tempered Grade, conforming to standards of American Hardboard Association or PS-50; use smooth side exposed.
- E. Particle Board: Not permitted.

2.3 LAMINATE MATERIALS

- A. High-Pressure Plastic Laminate: Conforming to NEMA LD3.1 and ISO 4586-2.
 - 1. Grades:
 - a. Horizontal Surfaces: ISO 10/HGS; horizontal, general purpose, standard.
 - b. Vertical Surfaces: ISO 20/VG; vertical, general purpose.
 - c. Cabinet Liner (If Specified TFM Panel is Not Used): ISO 72/CLS, cabinet liner, standard.
 - d. Backing Sheet: ISO 91/BKL; backer, light duty.
 - 2. Manufacturers: Formica, Wilsonart, Arborite, Pionite, Nevamar, or equal.
 - 3. Colors, and Patterns:
 - a. Exposed: As selected by Architect from manufacturer/suppliers' full product color range.
 - 1) There will be no additional cost allowance for premium color selections, or for selection of different colors for different rooms up to a maximum 6 colors.
 - 2) Doors and frames may be different selections.
 - b. Cabinet Liner: White.

2.4 ADDITIONAL MATERIALS

- A. Edge Bandings:
 - 1. 3-mm thick PVC: Solid, high impact, purified, color-thru, acid resistant, pre-laminated primed edging, machine-applied with hot melt adhesives, automatically trimmed, inside/outside length-radiused for uniform appearance, buffed and corner-radiused for consistent design.
 - a. Locations: Door and drawer face edge, and exposed shelf edge.

MANUFACTURED PLASTIC-LAMINATE-CLAD CASEWORK
SECTION 12 3216
3595001

- b. Color: As selected by Architect from manufacturer's full range of standard colors.
- 2. 0.02-inch thick PVC: Flat Edge, solid, high impact, purified, color-thru, acid resistant PVC, edging machine-applied with hot melt adhesives, automatically trimmed face, back and corners for uniform appearance.
 - a. Locations:
 - 1) Drawer body edge, not drawer face, and cabinet body edge including door and drawer front spacer rail.
 - 2) Interior body component edging, interior dividers and interior shelving.
 - b. Color: Match cabinet interior surface color.

2.5 HARDWARE

- A. Comply with requirements of BHMA A156.9, Type 2 (Institutional).
- B. Finishes:
 - 1. Exposed Items: Satin chromium plated, 626, unless otherwise noted complying with ANSI/BHMA A156.18.
 - 2. Concealed Items: Manufacturer's standard finish, complying with applicable product class of ANSI/BHMA A156.9.
- C. Hinges:
 - 1. Type: Heavy duty, five knuckle, 2-3/4-inch, institutional type hinge; let into door to achieve 1/8 inch reveals; Part Number 374 by Rockford Process Control, or equal, unless otherwise recommended by fabricator for total door and side panel thickness after application of laminate finish.
 - a. Hinges shall be mill ground, hospital tip, tight pin feature with all edges eased.
 - b. Hinges to be full wrap around type of tempered steel 0.095 inch thick.
 - c. Hinges shall accommodate 3/4 inch thick laminated door and allow 270 degree swing.
 - 2. Fasteners: Each hinge to have minimum 9 screws, #7, 5/8 inch FHMS to assure positive door attachment. Fill all holes if greater than 9.
 - 3. Quantity:
 - a. One pair per door to 48 inches in height.
 - b. One and one-half pair 48 inches in height to 84 inches in height.
 - c. Over 84 inches in height, provide 2 pair of hinges.
- D. Door and Drawer Pulls: Hafele, Catalog No. 110.08.400, or equal.
- E. Magnetic Catches: Häfele 246 with matching strike plate, matt nickel finish, or equal.
- F. Locks: CompX National Lock C8100 Series pin tumbler, or equal.
 - 1. All cabinets in each Room to be keyed alike.
 - 2. All Rooms to be keyed different.

MANUFACTURED PLASTIC-LAMINATE-CLAD CASEWORK
SECTION 12 3216
3595001

- 3. Locations: As indicated on the Drawings.
- G. Locks: Schlage CL2000 Series cabinet and drawer locks with solid brass 6 pin cylinders.
 - 1. Locks in rooms keyed alike; rooms keyed differently.
- H. Surface Bolt for Locked Pair Doors: Elbow Catch: #2 Elbow Catch by Ives, or equal.
 - 1. Finish: Satin chrome.
 - 2. Locate and mount surface bolt on door far enough below shelf to allow for 1/2-inch deflection of shelf and also to allow for proper engagement of surface bolt and angle strike.
- I. Drawer Guides: Accuride as specified, or equal:
 - 1. Drawers Less Than 24 inches Wide: Light duty, full extension; Model 3732.
 - a. Provide appropriate length.
 - b. Load Rating per Pair: 100-pounds.
 - 2. Drawers 24 inches to 36 Inches Wide: Medium duty with 1-inch over travel; Model 3301.
 - a. Provide appropriate length.
 - b. Load Rating per Pair: 150-pounds.
 - 3. Drawers 36-inches to 42-inches Wide: Heavy-duty with 1-inch over travel; Model 3634.
 - a. Provide appropriate length.
 - b. Load Rating per Pair: 200-pounds.
 - 4. Drawers 42-inches to 48-inches Wide: Heavy duty with 1-inch over travel; Model SS5321.
 - a. Provide appropriate length.
 - b. Load Rating per Pair: 350-pounds.
- J. Adjustable Shelf Supports: Seismic restraining type; "Universal 1" by Hettich International for insertion into 5 mm holes, or equal.

2.6 ADDITIONAL MATERIALS

- A. Bumper Pads (Silencers): Hemispherical, quiet clear type, 55 Shore A hardness; 3M Bumpon Protective Products, or equal.
- B. Adhesive: As recommended by panel manufacturer best suited for the intended use and that has a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
- C. Glue: Aliphatic-resin, polyurethane, or resorcinol wood glue recommended by manufacturer for general carpentry use that has a VOC content of 30 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
- D. Fasteners: Size and type to suit application in accordance with specified standards and as required.

MANUFACTURED PLASTIC-LAMINATE-CLAD CASEWORK
SECTION 12 3216
3595001

2.7 FABRICATION - GENERAL

- A. Construction shall conform to NAAWS casework requirements.
- B. Make job measurements as required for proper fabrication of the work.
- C. Grade: Custom. If provisions for the NAAWS Grade are in conflict with, or modified by the drawings and/or specifications, the modifications shall govern.
- D. Door and Drawer Front Style: Flush overlay, NAAWS Style A.
- E. Carcass Construction: Type A frameless. Provide as single unit at open shelving to greatest extent possible.

2.8 FABRICATION OF CABINET COMPONENTS

- A. Cabinet Bodies:
 - 1. Fabricate, assemble and finish each cabinet as complete, self-supporting unit.
 - a. Unless otherwise shown, counter height and tall storage units shall be 24 inches minimum overall depth; wall-hung units shall be 15 inches minimum overall depth.
 - b. At concealed locations, provide tops on all wall-hung and tall cabinets utilizing melamine on both faces.
 - c. At locations where the tops of wall hung or tall cabinets are visible, provide tops on all wall-hung and tall cabinets utilizing HPL on exterior face and melamine on interior face.
 - d. Fabricate bottoms, tops and frames of lock-joint glued and screwed, or dowelled and glued construction to end panel construction. Simple butted not permitted.
 - e. Tops and sides of tall units and wall-hung cabinets shall be 3/4-inch thick MDF core.
 - f. Bottoms of upper cabinets shall be constructed of same materials as specified for shelving.
 - g. Tall cabinets and base cabinets, fronts and sides shall be 3/4-inch thick MDF core.
 - h. Cabinet backs shall be a minimum of 1/4-inch thick.
 - i. Dowel and screw partitions and boxed shelves into top framing, bottoms or ends, as applicable.
 - j. Middle shelf of tall cabinets, 5 feet or greater in height, shall be fixed.
 - k. At top of counter height units, provide 3/4-inch plywood boxed subframe, mortised and tenonned, glued and screwed, for concealed attachment of countertop and for cabinet rigidity.
 - l. Provide toe space on floor-mounted units.
 - m. For tall units and wall-mounted cabinets, include 5/8 inch x 3 inch concealed wood strips full length at top and bottom, for screw or bolt anchorage to wall to conform to pull requirements of Title 24.
 - n. Holes for Shelf Support Clips: 32mm on center.

MANUFACTURED PLASTIC-LAMINATE-CLAD CASEWORK
SECTION 12 3216
3595001

- 1) Provide 2 holes on each side of shelf except provide a 3rd hole where cabinets are deeper than 24 inches.
 - 2) Locations shall be confirmed with Architect.
 - o. The fabrication of casework must allow for shim space at the base of the cabinets, to account for field conditions, as required so that the height from finish floor to top of counter, and sink rim where occurs, does not exceed the specified height at any location along the countertop after installation.
 - 2. Finishing:
 - a. Exposed Interior Surfaces and Semi-Exposed Surfaces:
 - 1) Melamine bonded to MDF core; specified TFM panel.
 - 2) Use for all semi-exposed surfaces, tops and bottoms of wall-hung and tall cabinets except as otherwise specified, concealed ends, partitions, and drawer boxes.
 - 3) See "Shelves" Paragraph for panel and finish requirements for shelving.
- B. Drawers:
- 1. Fabrication:
 - a. Fabricate and assemble drawer boxes with subfront and back glued and screwed into tenons at drawer sides.
 - b. Fronts shall be 3/4 inch thick MDF.
 - c. Sides: 1/2 inch thick MDF to create drawer box subfront, sides, back and bottom.
 - d. Extend bottom into dados with glue and screws at all 4 edges, using 1/4-inch materials matching the sides and backs.
 - e. At drawers over 30 inches wide, provide 1/2-inch bottoms.
 - f. Install 2-drawer guides for each drawer with positive closing and stop device to prevent inadvertent removal.
 - g. Drawer boxes to be full height of drawer opening.
 - h. Attach drawer front to subfront with #8 x 1-inch pan head wood screws (P.H.W.S.)
 - i. Provide closing stops at the rear of both drawer sides, unless stops are built into the slides to prevent the drawer front from impacting the cabinet body.
 - 2. Finishing:
 - a. Drawer Front: Vertical grade high-pressure laminate (HPL).
 - b. Interior Face of Drawer Front: Cabinet liner.
 - c. Band all 4 edges of drawer front with specified banding material.
 - d. Provide TFM panel with melamine finish on both faces, for subfront, sides, back and bottom.
- C. Doors:
- 1. Fabrication:
 - a. Panel: 3/4-inch thick MDF.

MANUFACTURED PLASTIC-LAMINATE-CLAD CASEWORK
SECTION 12 3216
3595001

- b. Hang face-mounted over cabinet, pairs parallel with proper clearance at pull edges. Install hardware.
 - c. Clearance Tolerances: Develop 1/8 inch maximum reveals.
 - 2. Finishing:
 - a. Exposed Exterior Face: Specified HPL.
 - 1) Where wood grain pattern is selected, provide pairs of doors with book-match wood grain patterns.
 - b. Exposed Interior Face: Cabinet liner.
 - c. Band all 4 edges of doors with specified banding material.
- D. Shelves:
 - 1. Fabrication - General:
 - a. Shelving to be adjustable on 1-1/4 inch centers supported by 4 adjustable shelf clips.
 - b. Loading capacity to be minimum 50 pounds per square foot, not to exceed 200 pounds on any shelf.
 - c. Shelving shall match the interior depth of the cabinet box.
 - d. Band all leading edges with edge banding material as specified.
 - 2. Shelving less than 24 inches: 3/4-inch MDF.
 - a. Finish: Melamine, both sides.
 - 3. Shelving 24 to 30 inches: 1-inch MDF.
 - a. Finish: Melamine, both sides.
 - 4. Shelving Greater than 30 inches, up to 36 inches: 1-inch, MDF.
 - a. Finish: Vertical grade HPL, both sides, applied with rigid glue line process.
 - 5. Shelving Greater than 36 inches, up to 48 inches: 1-inch plywood.
 - a. Finish: Vertical grade HPL, both sides, applied with rigid glue line process. Contact adhesive is not permitted.
- E. Scribes and Filler Panels:
 - 1. Provide matching scribes and filler panels, and scribe all cabinets to abutting walls, partitions and ceilings.
 - 2. Scribes shall not exceed 1-1/2 inches wide.
 - 3. Scribe to be covered top and bottom.
 - 4. At locations where casework wraps inside corners, provide top and bottom filler panels where voids occur.
- F. Cabinet Bases:
 - 1. If casework manufacturer chooses to use cabinet bases, they shall be 4 inches standard height.
 - 2. Fabricate completely out of 3/4-inch plywood in continuous lengths to insure straight and level installation of cabinet bodies. MDF is not acceptable for use at bases.

3. Freestanding cabinets shall have cabinet ends running directly to the floor.
4. Anchorage fasteners to be neatly installed through the back and anchor strip at the top and bottom, and middle at tall cabinets.

2.9 COORDINATION WITH APPLIANCES

- A. Contractor shall have casework manufacturer review all locations where appliances are to be installed and coordinate dimensions to ensure the correct size openings are provided.
 1. Shop drawings shall clearly indicate locations and opening dimensions.
 2. Where appliances are not in contract, shop drawings shall request confirmation of critical dimensions.
- B. Adjustments that need to be made to the casework due to appliances not fitting correctly are to be done at no additional cost to the Project.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Prior to installing casework, examine and verify that the installed work of all other trades is complete to the point where this work may properly commence.
- B. Verify that specified items may be installed in accordance with the approved design.
- C. Review in job conditions, installation requirements, and quality of completed substrate for compliance with Architect's expectations related to floor flatness for installation of casework.
- D. In the event of discrepancy, immediately notify the Architect. Do not proceed in discrepant areas until discrepancies have been fully resolved.

3.2 PREPARATION

- A. Take all necessary measurements in the field to ensure proper dimensions for cabinets prior to fabrication.
- B. Coordinate with other trades whose work adjoins, combines, or aligns with casework.
- C. Where substrate is not in compliance with Architect's expectations related to floor flatness for installation of casework, and where excessive shimming to meet these expectations would be required, level substrate using latex-modified, portland cement based or blended hydraulic-cement-based formulation as specified in Section 03 5416, Hydraulic Cement Underlayment.

3.3 INSTALLATION

- A. Install all work in conformance with the referenced NAAWS document.

MANUFACTURED PLASTIC-LAMINATE-CLAD CASEWORK
SECTION 12 3216
3595001

- B. Supervision: Installation work shall be under direct supervision of representative of manufacturer of the casework.
- C. Set work level, square and in true alignment. Cabinetwork shall fit to walls and upon completion of installation shall show no marks, indentations or other defects. Furnish scribes, filler panels, trim and molding required for finished installation. When set, each individual cabinet shall be capable of withstanding, without movement, a force of 200 pounds applied in any direction.
- D. Cabinet work shall be installed as required so that the height from finish floor to top of counter, and sink rim where occurs, does not exceed the specified height at any location along the countertop after installation.
- E. Method of attachment, including the type, size, frequency and/or spacing of anchoring devices and fasteners shall comply to NAAWS minimum requirements or be as indicated on the Drawings or as specified, whichever is more restrictive.
- F. Doors, drawers and fixtures shall operate correctly and smoothly.
- G. Furnish miscellaneous metal support and bracing required for installation. If necessary, deliver these items to other trades responsible for installation into adjacent work and designate exact location for their installation.
- H. Provide specified seismic restraining, adjustable shelf supports at all adjustable shelves to prevent shelf from sliding out of cabinets with or without doors.

3.4 ADJUSTING AND CLEANING

- A. Prior to final inspection and acceptance by the Architect, completely check each installed item and adjust for proper operation.
- B. Remove all fingerprints, smudges and the like from casework; vacuum clean drawers and interiors of dust, dirt and sawdust.

3.5 PROTECTION

- A. Protect work and materials of this Section prior to and during installation and protect the installed work and materials of other trades. Adjust all moving or operating parts to function smoothly and correctly.
- B. In the event of damage, make all repairs and replacements necessary to the approval of the Architect at no additional cost to the Owner.

END OF SECTION

p:\sacramento\3595 tracy unified school district\001-000_villalovoz es new shade structures\08 specifications\06 spec\04 final\villalovoz\12 3216_manufactured plastic-laminate-clad casework.docx
Last Updated: November 1, 2021

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Plastic laminate faced counters and splashes.

1.2 RELATED REQUIREMENTS

- A. Section 01 6116, Volatile Organic Compound (VOC) Restrictions, for VOC limits pertaining to adhesives, sealants, fillers, primers, and coatings.
- B. Section 01 8113, Sustainable Design Requirements, for CAL-Green general requirements and procedures.
- C. Section 06 4023, Interior Architectural Woodwork.
- D. Section 07 9200, Joint Sealants.
- E. Section 12 3216, Manufactured Plastic-Laminate-Clad Casework; casework to receive countertops.
- F. Division 26, Electrical, for electrical outlets and fittings built into countertops.

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CAL Green), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- C. American National Standards Institute (ANSI):
 - 1. A161.2: Decorative Laminate Countertops, Performance Standards for Fabricated High Pressure.
 - 2. A208.1: Particleboard.
 - 3. A208.2: Medium Density Fiberboard (MDF) for Interior Applications.
- D. International Organization for Standardization (ISO):
 - 1. 4586-2: "High-pressure decorative laminates (HPL, HPDL) - Sheets based on thermosetting resins (usually called laminates) - Part 2: Determination of properties."
- E. Woodwork Institute (WI): North American Architectural Woodwork Standards (NAAWS) published jointly by WI and the Architectural Woodwork Manufacturers of Canada (AWMAC).

PLASTIC-LAMINATE-CLAD COUNTERTOPS
SECTION 12 3623
3595001

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Submittal Procedures:
 - 1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
 - 2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
 - 3. Sustainable Design Submittals shall comply with the additional requirement of Section 01 8113, Sustainable Design Requirements.

1.5 ACTION SUBMITTALS

- A. Shop Drawings: Prepare for each countertop in accordance with Section 1 Article entitled "Submittals" of the referenced NAAWS document.
 - 1. Show items interfacing with countertops including relationship to supporting casework.
 - 2. Identify materials to be used.
 - 3. Shop drawings for countertops may be submitted as part of shop drawings prepared and submitted under Section 12 3216, Manufactured Plastic-Laminate-Clad Casework.
- B. Samples: 8 by 10-inch piece of selected pattern and color of plastic laminate.

1.6 INFORMATIONAL SUBMITTALS

- A. Before delivery of countertops to jobsite, submit a WI "Certified Compliance Certificate" listing the items certified, the applicable NAAWS Grade, and whether installation is included.
- B. Sustainable Design:
 - 1. General:
 - a. Submit information necessary to establish and document compliance with the California Green Building Standards Code.
 - b. Sustainable design submittals are in addition to other submittals.
 - 2. The following information shall be provided:
 - a. Adhesives and Sealants: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.
 - b. Composite Wood: Evidence of compliance that products meet formaldehyde limits of current CARB Airborne Toxic Control Measure (ATCM) as specified in Section 01 6116.
- C. Qualification Data: For fabricator.

1.7 CLOSEOUT SUBMITTALS

- A. Guarantee: Submit extended Contractor guarantee.

1.8 MAINTENANCE MATERIAL SUBMITTALS

- A. Grommets: 5 of each Type.

1.9 QUALITY ASSURANCE

- A. Fabricator Qualifications: Active member of WI. Other fabricators will be considered for approval upon submission of at least 5 years of verifiable evidence of experience in successful completion of work similar to work of this Project. This provision does not waive compliance with specified WI certification.
- B. Standard for Materials and Workmanship:
 - 1. Comply with the applicable requirements of Section 11 - Countertops of the "North American Architectural Woodwork Standards (NAAWS)" published jointly by WI and AWMAC. (hereinafter referred to as "woodworking standard").
 - 2. Where Contract Documents indicate requirements that conflict with or augment the woodworking standard, comply with the conflicting or augmenting requirements.
- C. Materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.
- D. Proof of compliance with the specified NAAWS Grade assembly and installation shall be provided by the following WI Quality Control Program:
 - 1. WI Monitored Compliance Program.
 - a. All countertops and the installation thereof for this project shall be directly monitored for compliance to the Contract by the Woodwork Institute under the scope of their Monitored Compliance Program (MCP).
 - 1) Inspections are to be performed at the beginning of fabrication, at the time of delivery to the job, at the beginning of installation, at completion of installation.
 - 2) Further information on the WI Monitored Compliance Program's Policies and Procedures are available directly from the Woodwork Institute, 916-372-9943.
 - 3) The WI MCP Registration Number shall be referenced in all communication.
 - b. Fees charged by the Woodwork Institute for their monitored compliance service are the responsibility of the Contractor and shall be included in the Contract sum.
 - c. Countertops and/or installation determined to be non-compliant by WI and not corrected will be rejected.
 - d. Issuance of the WI Monitored Compliance Certificate is a prerequisite of the Owner's final acceptance.

PLASTIC-LAMINATE-CLAD COUNTERTOPS
SECTION 12 3623
3595001

1.10 DELIVERY, STORAGE, AND HANDLING

- A. Do not deliver products until wet work, painting, and similar operations in storage and installation areas that could damage or soil work have been completed.
- B. Protect products during transit, delivery, storage, and handling so as to prevent damage, soiling, and deterioration.
- C. Store countertops only in areas where ambient conditions required can be and are maintained.
- D. Coordinate delivery with fabrication and installation of casework.

1.11 FIELD CONDITIONS

- A. Products shall be available at project when required for installation so as not to delay job progress. Contractor shall have its installer for these products cooperate with installers performing work under other Sections involved to effect proper installation.
- B. Environmental Limitations: Do not deliver or install countertops until building is enclosed, wet-work is complete, and HVAC system is operating and maintaining temperature and relative humidity at levels planned for building occupants during the remainder of the construction period.
- C. Field Measurements: Where countertops are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication and indicate measurements on shop drawings.

1.12 GUARANTEE

- A. Contractor: In addition to its standard Guarantee under the Contract, furnish Owner a special extended written 5-year guarantee, cosigned by installer, agreeing to repair or replace plastic-laminate-clad countertops that fail to perform as required within guarantee period as a result of failure of materials or installation workmanship at no additional cost to the Owner.

PART 2 - PRODUCTS

2.1 DESIGN AND PERFORMANCE CRITERIA

- A. Sustainable Design:
 - 1. VOC emissions for field-applied adhesives, sealants, and sealant primers must comply with limits specified in Section 01 6116.
 - 2. Composite wood products must meet current formaldehyde emission limits of CARB Airborne Toxic Control Measure (ATCM) as specified in Section 01 6116.

2.2 PANEL MATERIALS

- A. Medium-Density Fiberboard (MDF): ANSI A208.2, Grade 155, formaldehyde free. 3/4 inch thick unless otherwise indicated.

1. Typical Locations: Meeting grade MR30 moisture resistance; "Medite II," by Roseburg, or equal.
 2. At Sinks and Adjoining Countertops on Same Wall: Meeting grade MR50 moisture resistance; "Medex," by Roseburg, or equal.
- B. Particleboard: Not permitted.

2.3 LAMINATE MATERIALS

- A. High-Pressure Plastic Laminate: Conforming to ISO 4586-2.
- B. Grades:
1. Horizontal Surfaces and Backsplash: ISO 10/HGS; horizontal, general purpose.
 2. Postforming: ISO 12/HGP; horizontal, general purpose, postformable.
 3. Backing Sheet: ISO 91/BKL; backer, light duty.
- C. Manufacturers: Formica, Wilsonart, Arborite, Pionite, Nevamar, or equal.
- D. Colors, and Patterns: As selected by Architect from manufacturer/suppliers' full product color range.
1. There will be no additional cost allowance for premium color selections, or for selection of different colors for different rooms up to a maximum 6 colors.

2.4 ACCESSORIES

- A. Edge Treatment: Same as laminate cladding on horizontal surfaces.
- B. Grommets: Doug Mockett & Co. Inc., Manhattan Beach, CA, 310-318-2491, or equal.
1. Type: SG Series, or EDP Series; coordinate data connection requirements with Owner.
 2. Material and Color: As selected by Architect.
- C. Countertop Braces: A&M Brace as manufactured by A & M Hardware, Inc. or equal.
1. Size brace appropriate with size of countertop.
 2. Provide Häfele "Hebgo" (1100 lb. capacity) bracket, or equal at locations where continuous raceway runs directly below countertop brace.
 3. Provide largest brace available for given countertop depth to achieve maximum countertop support.
 4. Color: As selected by Architect from full range of manufacturer's standard colors. Multiple colors may be selected.
- D. Fasteners: Type and size as required.
- E. Adhesives: VOC compliant and passing NAAWS "Heat Resistance Test.". Do not use adhesives that contain urea formaldehyde.

PLASTIC-LAMINATE-CLAD COUNTERTOPS
SECTION 12 3623
3595001

2.5 FABRICATION

- A. General:
 - 1. Obtain field measurements, and verify dimensions before fabricating work.
 - 2. Comply with NAAWS Custom Grade requirements and ANSI A161.2.
- B. Core Material: Specified MDF.
- C. Fabricate to dimensions, profiles, and details shown.
- D. Build up countertop thickness to 1-1/2 inches at front, back, and ends with additional layers of core material laminated to top.
- E. Provide specified backing sheet at configurations and installation conditions recommended in the woodworking standard.
- F. All other Countertops: Provide roll-form 180-degree edge.
- G. Unless otherwise shown, round projecting or outside corners with 3/4-inch minimum radius or clip 45-degree angle corner.
- H. Provide joints only where maximum available lengths or countertop configuration requires a joint and where interfacing with existing. Where joints are required, balance and center. Make joints neat, flush and watertight.
- I. To greatest extent possible, complete fabrication and assembly before shipment to site.
 - 1. Disassemble components only as necessary for shipment and installation.
 - 2. Where necessary for fitting at site, provide extra borders and edges so as to allow scribing and trimming to fit.
- J. Precut openings for applied fixtures and fitting, where possible. Field cuts shall be performed by the fabricator.
- K. Conceal all fasteners.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Verify that backing has been installed at appropriate locations for anchorage.
- B. Examine shop-fabricated work for completion. Complete work as required.

3.2 INSTALLATION

- A. Install countertops in accordance with Section 11 of the NAAWS and requirements shown on the Drawings.

PLASTIC-LAMINATE-CLAD COUNTERTOPS
SECTION 12 3623
3595001

- B. Install countertops and backsplashes with concealed fastenings, securely attaching to cabinet bases or countertop braces / brackets at 36 inches on center maximum. Scribe neatly to walls or other adjoining surfaces.
- C. Make joints neatly, with uniform appearance.
- D. Install work plumb, level, true, and straight, with no distortions. Install with no variation in flushness of adjoining surfaces.
- E. Countertops shall be installed as required so that the height from finish floor to top of counter, and sink rim where occurs, does not exceed the specified height at any location along the countertop after installation.
- F. Shim as required, using concealed shims.
- G. Sealant: Install sealant as specified in Section 07 9200, Joint Sealants, to close small unavoidable gaps between counter and abutting surfaces, and at sinks. Sealant shall not be a substitute for tightly scribed work.
- H. Install, at no additional charge, extra stock grommets where directed by Owner following completion of countertop installation.

END OF SECTION

p:\sacramento\3595 tracy unified school district\001-000_villalovoz es new shade structures\08 specifications\06 spec\04 final\villalovoz\12 3623_plastic-laminate-clad countertops.docx
Last Updated: November 12, 2021

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes
 - 1. This section describes the basic requirements for the electrical work on this project.

1.2 REFERENCES

- A. National Electrical Contractors Association (NECA): Standard of Installation
- B. National Fire Protection Association (NFPA): 70E
- C. National Safety Council (NSC)
- D. Occupational Safety and Health Administration (OSHA)

1.3 SUBMITTALS

- A. Product Data
- B. Operation and Maintenance (O&M) Manuals
- C. Field Test Reports

1.4 QUALITY ASSURANCE

- A. Reference to Codes, Standards, Specifications and recommendations of technical societies, trade organizations and governmental agencies shall mean that latest edition of such publications adopted and published prior to submittal of the bid. Such codes or standards shall be considered a part of this Specification as though fully repeated herein.
- B. When codes, standards, regulations, etc. allow Work of lesser quality or extent than is specified under this Division, nothing in said codes shall be construed or inferred authority for reducing the quality, requirements, or extent of the Contract Documents. The Contract Documents address the minimum requirements for construction.
- C. Work shall be performed in accordance with all applicable requirements of the edition indicated on the drawings of all governing codes, rules and regulations including but not limited to the following minimum standards, whether statutory or not:
 - 1. California Electric Code (CEC)
 - 2. California Building Code (CBC)
 - 3. California Green Building Code (CGC)
 - 4. California Fire Code (CFC)

ELECTRICAL BASIC REQUIREMENTS

SECTION 26 0100

3595001000

5. California Energy Code (CENC)
 6. California Mechanical Code (CMC)
 7. California Plumbing Code (CPC)
- D. Standards: Equipment and materials specified under this Division shall conform to the following standards where applicable:
1. ACI American Concrete Institute
 2. ANSI American National Standards Institute
 3. ASTM American Society for Testing Materials
 4. CBM Certified Ballast Manufacturers
 5. ETL Electrical Testing Laboratories
 6. FS Federal Specification
 7. IEEE Institute of Electrical and Electronics Engineers, Inc.
 8. IPCEA Insulated Power Cable Engineer Association
 9. NEMA National Electrical Manufacturer's Association
 10. UL Underwriters' Laboratories
- E. Independent Testing Agency qualifications:
1. Testing Agency shall be an independent testing organization that will function as an unbiased authority, professionally independent of Manufacturer, Supplier and Contractor, furnishing and installing equipment or system evaluated by Testing Agency.
 2. Testing Agency shall be regularly engaged in the testing of electrical equipment, devices, installations, and systems.
 3. Testing Agency shall meet Federal Occupational Safety and Health Administration (OSHA) requirements for accreditation of independent testing laboratories, Title 9, Part 1907.
 4. On-site technical personnel shall be currently certified by the International Electrical Testing Association in electrical power distribution system testing.
 5. Testing Agency shall use technicians who are regularly employed by the firm for testing services.
 6. Contractor shall submit proof of above Testing Agency qualifications with bid documentation upon request.
- F. All base material shall be ASTM and/or ANSI standards.
- G. All electrical apparatus furnished under this Section shall conform to NEMA standards and the NEC and bear the UL label where such label is applicable.
- H. Certify that each welder performing Work has satisfactorily passed AWS qualification tests for welding processes involved and, if pertinent, has undergone re-certification.

PART 2 - PRODUCTS

- A. SEE SCHEDULES ON ELECTRICAL PLANS and other Division 26 sections

PART 3 – EXECUTION

3.1 ROUGH-IN

- A. Contractor shall verify lines, levels and dimensions indicated on the construction document drawings and shall be responsible for the accuracy of the setting out of Work and for its strict conformance with existing conditions at the Project site.
- B. Verify final locations for rough-ins with field measurements and with the requirements for the actual equipment to be connected.
- C. Refer to equipment specifications in other sections for equipment rough-in requirements.

3.3 INSTALLATION

- A. Preparation, sequencing, handling, and installation shall be in accordance with Manufacturer's written instructions and technical data particular to the product specified and/or accepted equal except as otherwise specified.
- B. Comply with Shop Drawings prepared by Manufacturer.
- C. Verify all dimensions by field measurements.
- D. Arrange for chases, slots, and openings in other building components during progress of construction, to allow for electrical installations.
- E. Coordinate the installation of required supporting devices and sleeves to be set in poured-in-place concrete and other structural components, as they are constructed.
- F. Sequence, coordinate and integrate installations of electrical materials and equipment for efficient flow of the Work. Give particular attention to large equipment requiring positioning prior to closing in the building.
- G. Where mounting height is not detailed or dimensioned, contact the Architect for direction prior to proceeding with rough-in.
- H. Coordinate connection of electrical systems with exterior underground and overhead utilities and services. Comply with requirements of governing regulations, franchised service companies and controlling agencies. Provide required connection for each service.
- I. Install systems, materials, and equipment to conform with approved submittal data, including coordination drawings, to greatest extent possible. Conform to arrangements indicated by the construction documents, recognizing that portions of the Work are indicated only in diagrammatic form. Where coordination requirements conflict with individual system requirements, refer conflict to the Architect.

ELECTRICAL BASIC REQUIREMENTS

SECTION 26 0100

3595001000

- J. Install systems, materials, and equipment level and plumb, parallel and perpendicular to other building systems and components, where installed exposed in finished spaces.
- K. Install electrical equipment to facilitate servicing, maintenance and repair or replacement of equipment components. As much as practical, connect equipment for ease of disconnecting, with minimum of interference with other installations.
- L. Coordinate electrical systems, equipment, and materials installations with other building components.
- M. Provide access panel or doors where devices or equipment are concealed behind finished surfaces.
- N. Install systems, materials and equipment giving right-of-way priority to other systems that are required to maintain a specified slope.
- O. Conform to the National Electrical Contractors' Association "Standard of Installation" for general installation practice.

3.3 CUTTING, PATCHING, PAINTING, AND SEALING

- A. Structural members shall in no case be drilled, bored, or notched in such a manner that will impair their structural value. Cutting of holes, if required, shall be done with core drill and only with the approval of the Architect and Structural Engineer.
- B. Protection of Installed Work: During cutting and patching operations, protect adjacent installations.
- C. Application of joint sealers:
 - 1. General: Comply with joint sealer Manufacturers' printed application instructions applicable to products and applications indicated, except where more stringent requirements apply.
 - 2. Installation of fire-stopping sealant: Install sealant, including forming, packing and other accessory materials, to fill openings around electrical services penetrating floors and walls, to provide fire-stops and fire-resistance ratings indicated for floor or wall assembly in which penetration occurs. Comply with installation requirements established by testing and inspecting agency.

3.4 FIELD QUALITY CONTROL

- A. General testing requirements:
 - 1. The purpose of testing is to ensure that all tested electrical equipment, both Contractor and Owner supplied, is operational and within industry and Manufacturer's tolerances and is installed in accordance with design Specifications.

ELECTRICAL BASIC REQUIREMENTS
SECTION 26 0100
3595001000

2. Tests and inspections shall determine suitability for energization.
 3. Perform tests in presence of the Owner's Representative and furnish test equipment, facilities and technical personnel required to perform tests.
 4. Tests shall be conducted during the construction period and at completion to determine conformity with applicable codes and with these Specifications.
- B. Tests: In addition to specific system test described elsewhere, tests shall include:
1. Equipment operations: Test motors for correct operation and rotation.
 2. Lighting control circuits: Test lighting circuits for correct operation through their control devices.
 3. Alarm and interlock systems: Produce malfunction symptoms in operating systems to test alarm and interlock systems. In addition, all specific tests described in the fire alarm system shall be performed.
 4. Circuit numbering verification: Select on a random basis various circuit breakers in the panelboards and cycle them on and off to verify compliance of the typed panel directories with actual field wiring.
 5. Voltage check:
 - a. At completion of job, check voltage at several points of utilization on the system that has been installed under this Contract. During test, energize all installed loads.
 - b. Adjust taps on transformers to give proper voltage, which is 118 to 122 volts for 120 volt nominal systems and proportionately equivalent for higher voltage systems. If proper voltage cannot be obtained, inform the Owner and the serving Utility Company.
- C. Contractor shall provide test power required when testing equipment before service energization and coordinate availability of test power with General Contractor after service energization. The Contractor shall provide any specialized test power as needed or specified herein.
- D. Testing safety and precautions:
1. Safety practices shall include the following requirements:
 - a. Applicable State and Local safety operating procedures.
 - b. OSHA
 - c. NSC
 - d. NFPA 70E
 2. All tests shall be performed with apparatus de-energized and grounded except where otherwise specifically required ungrounded by test procedure.
- E. Calibration of test equipment:
1. Testing Agency shall have calibration program that assures test instruments are maintained within rated accuracy.
 2. Instruments shall be calibrated in accordance with the following frequency schedule:
 - a. Field instruments: Analog, 6 month maximum; Digital, 12 months

ELECTRICAL BASIC REQUIREMENTS

SECTION 26 0100

3595001000

- maximum.
 - b. Laboratory instruments: 12 months.
 - c. Leased specialty equipment: 12 months where accuracy is guaranteed by lessor.
 - 3. Dated calibration labels shall be visible on test equipment.
 - 4. Records, which show date and results of instruments calibrated or tested, must be kept up-to-date.
 - 5. Up-to-date instrument calibration instructions and procedures shall be maintained for test instrument.
 - 6. Calibration standards shall be of higher accuracy than instrument tested.
 - 7. Equipment used for field testing shall be more accurate than instrument being tested.
- F. Coordinate with General Contractor regarding testing schedule and availability of equipment ready for testing.
- G. Notify Owner one week in advance of any testing.
- H. Any products which fail during the tests or are ruled unsatisfactory by the Owner's Representative shall be replaced, repaired, or corrected as prescribed by the Owner's Representative at the expense of the Contractor. Tests shall be performed after repairs, replacements or corrections until satisfactory performance is demonstrated.
- I. Testing Agency shall maintain written record of tests and shall assemble and certify final test report. All test results/reports shall be submitted to the Electrical Engineer for review.
- J. Include all test results in the maintenance manuals.

3.5 CLEANING

- A. Prior to energizing of electrical equipment, the Contractor shall thoroughly clean the interior of enclosures from construction debris, scrap wire, etc. using Manufacturer's approved methods and materials.
- B. Upon completion of Project, prior to final acceptance, the Contractor shall thoroughly clean both the interior and exterior of all electrical equipment per Manufacturers approved methods and materials. Remove paint splatters and other spots, dirt, and debris.
- C. Touch-up paint any marks, blemishes or other finish damage suffered during installation.

- END OF SECTION -

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes conduit, surface raceways, J-hooks, wireways, outlet boxes, pull and junction boxes, concrete pullboxes and vaults, floor boxes.

1.2 REFERENCES

1.3 AMERICAN NATIONAL STANDARDS INSTITUTE:

- A. ANSI C80.1 - Rigid Steel Conduit, Zinc Coated.
- B. ANSI C80.3 - Specification for Electrical Metallic Tubing, Zinc Coated.

1.4 NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION:

- A. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum).
- B. NEMA FB 1 - Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit and Cable Assemblies.
- C. NEMA OS 1 - Sheet Steel Outlet Boxes, Device Boxes, Covers, and Box Supports.
- D. NEMA OS 2 - Nonmetallic Outlet Boxes, Device Boxes, Covers, and Box Supports.
- E. NEMA RN 1 - Polyvinyl Chloride (PVC) Externally Coated Galvanized Rigid Steel Conduit and Intermediate Metal Conduit.
- F. NEMA TC 2 - Electrical Polyvinyl Chloride (PVC) Tubing and Conduit.
- G. NEMA TC 3 - PVC Fittings for Use with Rigid PVC Conduit and Tubing.

1.5 SYSTEM DESCRIPTION

- A. Raceway and boxes located as indicated on Drawings, and at other locations required for splices, taps, wire pulling, equipment connections, and compliance with regulatory requirements. Raceway and boxes are shown in approximate locations unless dimensioned. Provide raceway to complete wiring system.
- B. All wiring shall be installed in raceway.
- C. Provide raceway as follows:
 - 1. Underground: Provide thickwall nonmetallic conduit. Provide cast metal boxes or nonmetallic handhole.
 - 2. In Slab Above Grade: Not permitted.
 - 3. Below Slab on Grade: Use thickwall nonmetallic conduit. Terminate with coated rigid steel elbows and short length of coated rigid steel conduit out of concrete.

RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

SECTION 26 0533

3595001000

4. Outdoor Locations, Above Grade: Provide galvanized rigid steel conduit. Provide cast metal outlet, pull, and junction boxes.
5. Wet and Damp Locations: Provide galvanized rigid steel conduit. Provide cast metal outlet, junction, and pull boxes. Provide flush mounting outlet box in finished areas.
6. Concealed Dry Locations: Provide electrical metallic tubing. Provide sheet-metal boxes. Provide flush mounting outlet box in finished areas. Provide hinged enclosure for large pull boxes where shown on drawings. Provide J-hooks when shown on plans.
7. Exposed Interior Dry Locations: Use rigid steel conduit or intermediate metal conduit below eight feet or where subject to damage. Use rigid steel conduit, intermediate metal conduit, or electrical metallic tubing above eight feet or in electrical, mechanical or telecommunication rooms. Use sheet-metal or cast metal boxes. Use flush mounting outlet box in finished areas. Provide hinged enclosure for large pull boxes.

1.6 DESIGN REQUIREMENTS

- A. Minimum Raceway Size: 0.75 inch unless otherwise specified.
- B. Minimum Raceway Size for Data Communications: 1.00 inch unless otherwise specified.
- C. Minimum Raceway Size for Telecommunications: 1.00 inch unless otherwise specified.
- D. Minimum Raceway Size for AV Systems: 1.00 inch unless otherwise specified.

1.7 CLOSEOUT SUBMITTALS

- A. Project Record Documents:
 1. Record actual routing of conduits larger than 2 inches.
 2. Record actual locations and mounting heights of outlet, pull, and junction boxes.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Protect conduit from corrosion and entrance of debris by storing above grade. Provide appropriate covering.
- B. Protect PVC conduit from sunlight.

1.9 COORDINATION

- A. Coordinate mounting heights, orientation and locations of outlets mounted above counters, benches, and backsplashes.
- B. Coordinate Work of this Division and Work of other Divisions in advance of installation. Provide additional Work to overcome tight conditions at no increase in Contract Sum.
- C. Coordinate installation of outlet boxes for equipment specified in other divisions.

PART 2 - PRODUCTS

2.1 METAL CONDUIT

- A. Rigid Steel Conduit: ANSI C80.1.
- B. Rigid Aluminum Conduit: ANSI C80.5.
- C. Intermediate Metal Conduit (IMC): Rigid steel.
- D. Fittings and Conduit Bodies: NEMA FB 1. Fittings shall be steel/malleable iron with threaded fittings. Use insulated metallic bushings with lug where ground connections are required. Use plastic bushing for non-bonding applications.

2.2 PVC COATED METAL CONDUIT

- A. Product Description: NEMA RN 1; rigid steel conduit with external PVC coating, 40 mil thick.
- B. Fittings and Conduit Bodies: NEMA FB 1; steel fittings with external PVC coating to match conduit.

2.3 FLEXIBLE METAL CONDUIT

- A. Product Description: Interlocked steel construction.
- B. Fittings: NEMA FB 1.

2.4 LIQUIDTIGHT FLEXIBLE METAL CONDUIT

- A. Product Description: Interlocked steel construction with PVC jacket.
- B. Fittings: NEMA FB 1.

2.5 ELECTRICAL METALLIC TUBING (EMT)

- A. Product Description: ANSI C80.3; galvanized tubing.
- B. Fittings and Conduit Bodies: NEMA FB 1; steel couplings and connectors. Box connectors shall have with insulated throat. Set screw type couplings.

2.6 NONMETALLIC CONDUIT

- A. Product Description: NEMA TC 2; Schedule 40 PVC.
- B. Fittings and Conduit Bodies: NEMA TC 3.

2.7 SURFACE RACEWAY (WIREMOLD)

- A. Product Description: Surface raceway as shown on plans. Raceway shall be Wiremold or equal.

RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

SECTION 26 0533

3595001000

- B. Fittings: Provide all supports, adapters, clips, elbows, covers, device fittings, and other hardware as required for a complete installation. Provide B-Line "transition" boxes to clear offset surfaces. Supports shall be concealed, exposed straps are not allowed.
- C. Finish:
 - 1. Steel raceway and associated transition boxes and exposed hardware shall be spray painted with two coats of semi-gloss acrylic enamel paint, color as directed by Architect.
 - 2. Aluminum raceway shall be provided with factory finish, color as directed by Architect. Transition boxes shall be spray painted with two coats of semi-gloss acrylic enamel paint, color as directed by Architect.
 - 3. Plastic raceway shall be provided with factory finish, color as directed by Architect. Transition boxes shall be spray painted with two coats of semi-gloss acrylic enamel paint, color as directed by Architect.
 - 4. Coordinate all colors with Architect prior to ordering.

2.8 J-HOOKS

- A. Product Description: Low voltage signal cable J-Hooks shall be Panduit. Provide with support device for construction encountered.

2.9 WIREWAY

- A. Product Description: General purpose for indoor applications and raintight type for outdoor locations wire way.
- B. Knockouts: Manufacturer's standard.
- C. Cover: Hinged cover with full gaskets.
- D. Connector: Flanged.
- E. Fittings: Lay-in type with removable top, bottom, and side; captive screws and drip shield for outdoor.
- F. Finish: Rust inhibiting primer coating with gray enamel finish.

2.10 OUTLET BOXES

- A. All boxes shall be suitable for the environment in which they are installed.
- B. Sheet Metal Outlet Boxes: NEMA OS 1, galvanized steel.
 - 1. Luminaire and Equipment Supporting Boxes: Rated for weight of equipment supported; furnish 0.5-inch male fixture studs where required.
 - 2. Boxes for shall be 1.5-inch-deep by 4-inch square minimum for single devices.
 - 3. Boxes for shall be 1.5-inch-deep by 4-11/16 inch square minimum for two devices.
 - 4. Boxes for data and signal outlets shall be 2-1/8-inch-deep by 4-11/16-inch square minimum.
 - 5. Concrete Ceiling Boxes: Concrete type.

RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

SECTION 26 0533

3595001000

6. Provide rings as required.

- C. Cast Boxes: NEMA FB 1, Type FD, aluminum. Furnish gasketed cover by box manufacturer. Furnish threaded hubs.

2.11 BOX EXTENSIONS

- A. At rooms being remodeled and where existing walls are to receive new finish material, replace existing plaster rings with new rings.

2.12 PULL AND JUNCTION BOXES

- A. Boxes having an internal volume less than 100 cubic inches shall be as specified for outlet boxes. Boxes having internal volume greater than 100 cubic inches shall be of panelboard type construction except that covers shall be secured by screws or bolts.
- B. Boxes exposed to rain or installed in wet locations shall be specifically designed for the purpose.
- C. All boxes shall be installed so that covers are accessible after completion of the installation.
- D. Boxes shall not be installed in finished areas unless specific approval for such installation is granted by Architect.

2.13 CONCRETE PULLBOXES AND VAULTS

- A. Boxes: Boxes shall be precast, high density reinforced concrete. In areas of vehicular traffic, boxes shall be H20 rated.
- B. Extensions: Extensions shall be provided at each pullbox. Provide a minimum of (1) extension. Provide additional extension(s) as required to provide space in box for code required cable bending.
- C. Covers: Covers in concrete or asphalt shall be galvanized. In all other areas, covers shall be steel checker plate. In areas of vehicular traffic, lids shall be galvanized steel, H20 rated. All covers shall be provided with hold-down bolts.
- D. Floor: Provide poured concrete slab as detailed on plans. At H20 rated boxes, provide manufacturer's concrete slab.
- E. Size: Provide size as noted on plans. If size is not shown, provide boxes sized per codes.
- F. Labeling: Covers shall be factory marked as shown on plans.

2.14 FLUSH MULTI SERVICE FLOOR BOXES (4 PORT)

- A. Floor boxes shall be cast iron, fully adjustable, Walker RFB4-CI-1 with FPBTCAL cover. Provide brackets required to mount devices shown on plans. Provide blank plates at unused ports.

RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

SECTION 26 0533

3595001000

2.15 FLUSH MULTI SERVICE FLOOR BOXES (11 GANG):

- A. Floor boxes shall be steel, fully adjustable, Walker RFB11 with RFB119BTCAL cover. Provide brackets required to mount devices shown on plans. Provide blank plates at unused ports.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify outlet locations and routing and termination locations of raceway prior to rough-in.

3.2 EXISTING WORK

- A. Remove exposed abandoned raceway, including abandoned raceway above accessible ceiling finishes. Cut raceway flush with walls and floors, and patch surfaces.
- B. Remove concealed abandoned raceway to its source.
- C. Disconnect abandoned outlets and remove devices. Remove abandoned outlets when raceway is abandoned and removed. Install blank cover for abandoned outlets not removed.
- D. Maintain access to existing boxes and other installations remaining active and requiring access. Modify installation or provide access panel.
- E. Extend existing raceway and box installations using materials and methods [compatible with existing electrical installations, or] as specified.
- F. Clean and repair existing raceway and boxes to remain or to be reinstalled.
- G. At rooms being remodeled and where existing walls are to receive new finish material, replace existing plaster rings with new rings with depth required to bring box flush with new finish. Contractor shall review Architectural drawings prior to bid to note walls receiving new finishes (tackboards, sheetrock, etc.) and include the necessary work in bid.

3.3 INSTALLATION

- A. Ground and bond raceway and boxes.
- B. Fasten raceway and box supports to structure and finishes.
- C. Identify raceway and boxes.
- D. Arrange raceway and boxes to maintain headroom and present neat appearance.

3.4 INSTALLATION - RACEWAY

- A. Raceway routing is shown in approximate locations unless dimensioned. Route to complete wiring system.

RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

SECTION 26 0533

3595001000

- B. Unless otherwise specified, all raceway shall be installed concealed. Raceway may be run exposed on unfinished walls, in attic spaces, in electrical rooms and when routed to surface panels, cabinets or gutters.
- C. Arrange raceway supports to prevent misalignment during wiring installation.
- D. Support raceway using coated steel or malleable iron straps, lay-in adjustable hangers, clevis hangers, and split hangers.
- E. Group related raceway; support using conduit rack. Construct rack using steel channel and provide space on each for 25 percent additional raceways.
- F. Do not support raceway with wire or perforated pipe straps. Remove wire used for temporary supports
- G. Do not attach raceway to ceiling support wires or other piping systems.
- H. Construct wire way supports from steel channel.
- I. Route exposed raceway parallel and perpendicular to walls.
- J. Route raceway installed above accessible ceilings parallel and perpendicular to walls.
- K. Route conduit in and under slab from point-to-point.
- L. Maintain clearance between raceway and piping for maintenance purposes.
- M. Maintain 12-inch clearance between raceway and surfaces with temperatures exceeding 104 degrees F.
- N. Cut conduit square using saw or pipe cutter; de-burr cut ends.
- O. Bring conduit to shoulder of fittings; fasten securely.
- P. Join nonmetallic conduit using cement as recommended by manufacturer. Wipe nonmetallic conduit dry and clean before joining. Apply full even coat of cement to entire area inserted in fitting. Allow joint to cure for minimum 20 minutes.
- Q. Install conduit hubs to fasten conduit to sheet metal boxes in damp and wet locations and to cast boxes.
- R. Install no more than equivalent of three 90-degree bends between boxes. Install conduit bodies to make sharp changes in direction, as around beams. Install factory elbows for bends in metal conduit larger than 2-inch size.
- S. Avoid moisture traps; install junction box with drain fitting at low points in conduit system.
- T. Install fittings to accommodate expansion and deflection where raceway crosses seismic and expansion joints.
- U. Install suitable pull string or cord in each empty raceway except sleeves and nipples.

RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

SECTION 26 0533

3595001000

- V. Install suitable caps to protect installed conduit against entrance of dirt and moisture.
- W. Surface Raceway:
 - 1. Anchor raceway to structural members using screws. Supports shall be concealed. Space screws 24" maximum on center. Each run shall have a minimum of (2) screws.
 - 2. Mount plumb and level.
 - 3. Install insulating bushings and inserts at connections to outlets and corner fittings.
 - 4. Raceway shown on plans is schematic. Contractor shall coordinate exact routing and installation with building conditions and provide all parts, pieces, elbows, transition boxes and other items as required for a complete, closed and professionally installed installation.
 - 5. Coordinate exact routing with Architect prior to installation.
- X. J-Hooks:
 - 1. Provide J-hooks 48" maximum on center.
 - 2. All cable to be run parallel and perpendicular to building lines.
 - 3. Provide mounting hardware as required.
 - 4. Provide Unistrut channels between structural members as required.
 - 5. Provide 24" long 2" conduit sleeves through walls, draft stops, etc. Provide as many as necessary to accommodate cables in contract plus two extra capped at each end for future cabling. All conduits shall be provided with bushed ends.
- Y. Close ends and unused openings in wire way.

3.5 EXCAVATING AND TRENCHING:

- A. Perform all excavations as required for the installation of the work included under this Section, including shoring of earth banks to prevent cave-ins and to protect workmen and equipment.
- B. Restore all surfaces, roadways, walks, curbs, walls, existing underground installation, etc., damaged or cut as a result of the excavations to their original condition in a manner approved by the Architect.
- C. Stop machine excavation for trenches, in solid ground, several inches above required grade line, then trim trench bottom by hand to accurate grade so that a firm and uniform bearing throughout entire length of duct is provided. In lieu of above hand excavation in bottom of trench, Contractor may excavate to depth no less than 6" below required grade line and place a bed of sand or granular soil, properly compacted to provide a uniform grade and to provide a firm support for duct throughout its entire length.
- D. Minimum conduit depth of pipe crown shall be 2'0" below finished or natural grade, unless detailed otherwise on Drawings. Conduits under parking lots, roadways, driveways, fire truck access routes, and other areas subject to vehicular traffic shall be installed a minimum of 24" below grade.

3.6 BACKFILLING:

- A. No backfilling operations shall begin until the required tests and inspection has been made. Should any of the work be enclosed or covered up before it has been approved, Contractor shall, at his expense, uncover the work.
- B. After it has been inspected, tested, and approved, he shall make all repairs necessary to restore the work of other contractors to the condition in which it was found at the time of uncovering.
- C. Except under existing paved area, walks, roads, or similar surfaces, and in cases where rock is encountered, backfill more than 12" above the top of the pipe shall be made using suitable excavated material placed in 6" layers measured before compaction, and tamped by machine.
- D. Surface work shall be replaced to match the existing.
- E. Entire backfill for bored excavations under existing pavement, walks, roads, or similar surfaces, shall be made with clean sand compacted by flooding.
- F. The contractor shall install a marking tape 6" below grade and directly above all electrical conduits. The tape shall consist of a 4 mil insert plastic film specifically formulated for prolonged use underground. It shall be highly resistant to alkalis, acids and other destructive agents found in the soil. Tape shall have a minimum tensile strength of 20 lbs. per 3" with strips and a minimum elongation of 500%. Tape shall bear a continuous painted message repeated every 16" to 36" warning of the installation buried below. The message shall read "CAUTION – ELECTRICAL POWER LINE BURIED BELOW" or "CAUTION – ELECTRICAL SIGNAL LINES BURIED BELOW" as applies. Installation instruction for the tape shall be printed with each message along the entire length. The tape shall be as that manufactured by Reef Industries, Inc., or approved equal. For those installations involving non-metallic pipe, tape shall be aluminum foil encased in two layers of inert plastic film enabling the tape to be inductively located. Terre Tape "D" Warning Tapes are acceptable. When conduit below is plastic, tape shall have metallic content and shall respond to metal detectors. Do not exclude this. It will be required to verify the installation of this tape.

3.7 FLASHING AND SEALING:

- A. Flash and counterflash roof and wall penetrations in manner described under other applicable sections of this Specification and as approved by the Architect.
- B. Conduits, ducts, etc., passing through finished walls and ceilings shall be fitted with steel escutcheon plates, chrome or paint finish as directed.
- C. Conduits which penetrate floor slabs and concrete or masonry walls shall be grouted and sealed watertight at penetration.
- D. Conduits penetrating exterior walls other than concrete or masonry shall be sealed watertight with polyurethane sealant.

RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

SECTION 26 0533

3595001000

- E. Underground conduits stubbing up into a room shall be sealed around cables or pullstring with foam sealant.
- F. All flashing and sealing shall be provided by this Contractor.

3.8 INSTALLATION – BOXES

- A. Boxes shall be accurately placed as shown on Drawings or as close thereto as possible. Contractor shall refer to Drawings, specifications, and submittals covering work of the other trades to coordinate outlet location. In the event of conflict between planned locations of outlet and other equipment or furnishing, Contractor shall not proceed until direction has been given by Architect.
- B. Unless otherwise specified or shown on Drawings, boxes shall be flush mounted with front edge of box or ring flush with wall or ceiling finish. Use plaster ring of appropriate depth in plastered or gypboard applications. Contractor shall review architectural drawings and note wall and ceiling construction and finishes for each wall.
- C. Boxes shall not be installed back-to-back in walls. To prevent sound transfer, outlets, switches, etc. shown on opposing sides of the same wall shall be installed in separate stud spaces, except that outlets installed at different elevations may occupy the same stud space when box separation exceeds 18". Where these requirements cannot be met, Contractor shall provide insulation material between boxes.
- D. Orient boxes to accommodate wiring devices.
- E. Install pull boxes and junction boxes above accessible ceilings and in unfinished areas only.
- F. In Accessible Ceiling Areas: Install outlet and junction boxes no more than 6 inches from ceiling access panel or from removable recessed luminaire.
- G. Locate flush mounting box in masonry wall to require cutting of masonry unit corner only. Coordinate masonry cutting to achieve neat opening.
- H. Install stamped steel bridges to fasten flush mounting outlet box between studs.
- I. Install flush mounting box without damaging wall insulation or reducing its effectiveness.
- J. Install adjustable steel channel fasteners for hung ceiling outlet box.
- K. Do not fasten boxes to ceiling support wires or other piping systems.
- L. Support boxes independently of conduit.
- M. Install gang box where more than one device is mounted together. Do not use sectional box.
- N. Install gang box with plaster ring for single device outlets.

3.9 INSTALLATION CONCRETE PULLBOXES AND VAULTS

- A. Install boxes flush with finished grade or surface material.
- B. Install hold down bolts for all covers.
- C. Ground bond steel cover plate with insulated green grounding conductor.
- D. Grout between box and extension(s).
- E. Any box installed in areas of vehicular traffic shall be H20 rated. Contractor shall verify this requirement prior to ordering.

3.10 INTERFACE WITH OTHER PRODUCTS

- A. Install conduit to preserve fire resistance rating of partitions and other elements.
- B. Route conduit through roof openings for piping and ductwork or through suitable roof jack with pitch pocket. Coordinate location with roofing installation.
- C. Locate outlet boxes to allow luminaires positioned as indicated on reflected ceiling plan.
- D. Align adjacent wall mounted outlet boxes for switches, thermostats, and similar devices.

3.11 ADJUSTING

- A. Adjust flush-mounting outlets to make front flush with finished wall material.
- B. Install knockout closures in unused openings in boxes.

3.12 CLEANING

- A. Clean interior of boxes to remove dust, debris, and other material.
- B. Clean exposed surfaces and restore finish.

- END OF SECTION -

PART 1 – GENERAL

1.1 SUMMARY

- A. This section describes the requirements for the cabinets and enclosures for this project.

1.2 REFERENCES

- A. National Electrical Manufacturer's Association (NEMA):
 - 1. NEMA 250; Enclosures for Electrical Equipment.
 - 2. NEMA ICS 1; Industrial Control and Systems.
 - 3. NEMA ICS 4; Terminal Blocks and Industrial use.
 - 4. NEMA ICS 6; Enclosures for Industrial Controls and Systems.
- B. Underwriters Laboratories (UL):
 - 1. UL 50; Enclosures for Electrical Equipment.
 - 2. UL 65; Standards for Wired Cabinets.
 - 3. UL 1059; Terminal Blocks.
 - 4. UL 1773; Termination Boxes.

1.3 SUBMITTALS

- A. Product Data: Submit manufacturer's standard data for enclosures, and terminal cabinets.
- B. Manufacturer's Instructions: Submit application conditions and limitations of use stipulated by product testing agency specified under Regulatory Requirements. Include instructions for storage, handling, protection, examination, preparation, and installation of product.

1.4 QUALITY ASSURANCE

- A. All materials, equipment and parts comprising the units specified herein shall be new, unused, and currently under production.
- B. Only products and applications listed in this Section may be used on the Project unless otherwise submitted.

PART 2 - PRODUCTS

2.1 CABINETS AND ENCLOSURES

- A. Description: Interior Locations: NEMA 1. Exterior locations: NEMA 3R
- B. Construction: Shall be code gauge galvanized steel with standard concentric knockouts for conduit terminations. Size shall be as indicated on Drawings.

CABINETS AND ENCLOSURES
SECTION 26 2716
3595001000

- C. Backboard: Furnish 5/8-inch-thick plywood backboard for mounting terminal blocks. Paint with (3) coats of fire retardant white paint.
- D. Finish: Manufacturer's standard gray baked enamel finish.
- E. Covers: Continuous hinged steel door, lockable and keyed to match panelboard locks. Provide padlock hasp at exterior locations.
- F. Mounting:
 - 1. Flush cabinets shall be furnished with concealed trim clamps and shall be not less than 4 inches deep.
 - 2. Surface cabinets shall be furnished with screw cover trim, flush hinged door and shall not be less than 6 inches deep.

2.2 SIGNAL TERMINAL BACKBOARDS

- A. Furnish cabinet with 3/4-inch fire retardant plywood mounting backboard on interior unless otherwise indicated on Drawings. 8' high x width shown on plans or as required
- B. Finish: Paint with (3) coats of fire-retardant white paint

2.3 TERMINAL BLOCKS AND ACCESSORIES

- A. Terminal blocks: NEMA ICS 4; UL listed.
- B. Power terminals: Unit construction type, closed-back with tubular pressure screw connections, rated 600 volts.
- C. Identification: Identify terminal strips with permanent numbers.
- D. Wiring diagram: Provide wiring diagram in protective pocket on inside front cover of cabinet. Diagram shall indicate control wiring, connections, and layout of components within enclosure.

2.4 HINGED COVER ENCLOSURES

- A. Description: NEMA 250, Type 1 (Interior) and 3R (Exterior) steel enclosure
 - 1. Covers: Continuous hinge, held closed by flush latch operable by key.
 - 2. Furnish interior plywood panel for mounting terminal blocks and electrical components; finish with white enamel.
 - 3. Enclosure Finish: Manufacturer's standard enamel.

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Contractor shall thoroughly examine Project site conditions for acceptance of cabinets and enclosures installation to verify conformance with Manufacturer and Specification tolerances. Do not commence with installation until all conditions are made satisfactory.

3.2 INSTALLATION

- A. Set cabinets and enclosures plumb and symmetrical with building lines. Furnish and install all construction channel bolts, angles, etc. required to mount all equipment furnished under this Section of the Specifications.
- B. Cabinets and enclosures shall be anchored and braced to withstand seismic forces calculated in accordance with that referenced in Section 26 0100: Basic Electrical Requirement.
- C. "Train" interior wiring, bundle and clamp using specified plastic wire wraps.
- D. Install interior cabinets with top of enclosure 6'6" above finished floor.
- E. Install exterior cabinets with top of enclosure 6'6" above finished grade.
- F. Replace doors or trim exhibiting dents, bends, warps or poor fit that may impede ready access, security or integrity.
- G. Terminate conduit in cabinet with lock nut and grounding bushing.
- H. Terminate wiring on terminal blocks and identify each with heat shrink tags.

3.3 CLEANING

- A. Touch up scratched or marred surfaces to match original finish.
- B. Clean electrical parts to remove conductive and harmful materials.
- C. Remove dirt and debris from enclosure.
- D. Clean existing panelboards and load centers to remain or to be reinstalled.

- END OF SECTION -

PART 1— GENERAL

1.1 SUMMARY

- A. Section Includes
 - 1. This section describes the requirements for the circuit protective devices for this project.

1.2 REFERENCES

- A. Federal Specification (FS):
 - 1. FS W-C-375; Circuit Breakers, Molded Case, Branch Circuit and Service.
 - 2. FS W-F-870; Fuseholders (for Plug and Enclosed Cartridge Fuses).
- B. Underwriters Laboratories, Inc. (UL):
 - 1. UL 248(1-16); Low-Voltage Fuses.
 - 2. UL 489; Molded-Case Circuit Breakers, Molded-Case Switches and Circuit Breaker Enclosures.
 - 3. UL 512; Fuseholders.
 - 4. UL 1066; Low Voltage AC and DC Power Circuit Breakers Used in Enclosures.
- C. National Electrical Manufacturer Association (NEMA):
 - 1. NEMA AB 1; Molded Case Circuit Breakers.

1.3 SUBMITTALS

- A. Product Data
- B. Operation and Maintenance (O&M) Manuals

1.4 QUALITY ASSURANCE

- A. All materials, equipment and parts comprising the units specified herein shall be new, unused, and currently under production.
- B. Only products and applications listed in this Section may be used on the Project unless otherwise submitted.

1.5 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Delivery: Overcurrent Protective Device components shall not be delivered to the Project site until protected storage space is available. Storage outdoors covered by rainproof material is not acceptable. Equipment damaged during shipment shall be replaced and returned to Manufacturer at no cost to Owner.

CIRCUIT PROTECTIVE DEVICES

SECTION 26 2800

3595001000

- B. Storage: Store in a clean, dry, ventilated space free from temperature extremes. Maintain factory wrapping or provide a heavy canvas/plastic cover to protect units from dirt, water, construction debris and traffic. Provide heat where required to prevent condensation.
- C. Handling: Handle in accordance with Manufacturer's written instructions. Be careful to prevent internal component damage, breakage, denting and scoring. Damaged units shall not be installed. Replace damaged units and return equipment to Manufacturer.

PART 2 - PRODUCTS

2.1 FUSES

- A. General: All power fuses shall be time-delay, high interrupting (300 K AIC), current limiting type, unless otherwise noted on the Drawings. All fuses shall be the product of a single Manufacturer and shall be selectively coordinated when applied in 2:1 ratios. Types of fuses shall be as follows:
 - 1. 0 - 600 amperes: UL Class J, dual element, time delay type fuse with separate overload and short-circuit elements. The fuse shall hold 500% of rated current for a minimum of 10 seconds.
 - 2. 601 - 4000 amperes: UL Class L, time delay type fuses with 99.9% pure silver fuse links and "O-rings" to seal between the end bells and the fuse barrel. Fuses shall hold 500% of rated current for a minimum of 4 seconds, clear 20 times rated current in 0.01 seconds or less.
 - 3. Motor branch circuit fuses (0-600 amperes): UL Class J dual element, time delay type fuse. Motor branch circuit fuses shall be sized for Type 2 coordination for the motor controller and back-up motor overload protection and shall be coordinated with motor starter overload relay heaters.
- B. Control and instrument fuses shall be suitable for installing in blocks or fuse holders. Exact type and rating shall be as recommended by the Manufacturer of the equipment being protected.
- C. Fuses for installation in current limiting circuit breakers or motor circuit protectors shall meet the specific requirements of the Manufacturers of that equipment to ensure compatibility.

2.2 MOLDED CASE CIRCUIT BREAKERS

- A. Unless noted otherwise, circuit breakers shall be molded case, bolt on and trip indicating.
- B. Where stationary molded case circuit breakers are indicated on the Drawings to be current limiting type, they shall be current limiting as defined by UL 489 and shall not employ any fusible elements.
- C. Circuit breakers shall have interrupting capacity not less than that indicated on the Drawings or if not indicated, not less than 25,000 RMS symmetrical amps for 480

volt systems and 10,000 RMS symmetrical amps for 208 volt systems.

- D. Covers shall be sealed on non-interchangeable breakers and trip unit covers shall be sealed on interchangeable trip breakers to prevent tampering. Circuit breaker ratings shall be clearly visible after installation or engraved nameplates shall be provided stating the rating. All ferrous parts shall be plated to minimize corrosion.
- E. Circuit breakers shall be toggle, quick-make and quick-break operating mechanisms with trip-free feature to prevent contacts being held closed against overcurrent conditions in the circuit. Trip position of the breakers shall be clearly indicated by operating handles moving to a center position.
- F. Multipole breakers shall have a single handle to open and close all contacts simultaneously in both manual operation and under automatic tripping. Interpole barriers shall be provided inside the breaker to prevent any phase-to-phase flashover. Each pole of the breaker shall have means for Arc extinguishing.
- G. All terminals shall be rated for aluminum or copper wire.
- H. Unless noted otherwise, circuit breakers with trip ratings 400 amp and smaller shall be ambient temperature compensated, thermal magnetic type unless otherwise noted. Breakers shall be of full size, 1" per pole type. Panels with more than one branch breaker larger than 100 amps shall be installed in distribution type panels.
- I. Accessories: Provide accessories as noted on the Drawings, i.e. shunt-trip, auxiliary contacts, undervoltage trip, alarm switch, etc.
- J. Spaces in the boards shall be able to accept any combination of 1, 2 or 3 pole circuit breakers as indicated. Provide all necessary bus, device supports and mounting hardware sized for frame, not trip rating.
- K. Series rated breakers are not acceptable unless specifically noted on the Drawings.

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Contractor shall thoroughly examine Project site conditions for acceptance of cabinets and enclosures installation to verify conformance with Manufacturer and Specification tolerances. Do not commence with installation until all conditions are made satisfactory.

3.2 INSTALLATION

- A. Install overcurrent protective devices in accordance with Manufacturer's written instructions, as indicated on the Drawings and as specified herein.
- B. Tighten electrical connectors and terminals; including screws and bolts, in accordance with equipment Manufacturers published torque-tightening values for

CIRCUIT PROTECTIVE DEVICES
SECTION 26 2800
3595001000

equipment connectors. Where Manufacturers torque requirements are not indicated tighten connectors and terminals to comply with tightening torque specified in UL Standard 486A.

- C. Install overcurrent protective devices and accessories in accordance with Manufacturer's written instructions and with recognized industry practices to ensure that protective devices comply with requirements. All devices shall be installed in accordance with applicable CEC and NEMA standards for installation.
- D. Circuit breakers serving "Fire Alarm Control Panel(s)" shall be red in color.

3.3 FIELD QUALITY CONTROL

- A. The Contractor shall supply a suitable and stable source of electrical power to each test site.
- B. Testing of overcurrent protective devices shall be done only after all devices are installed and system is energized.
- C. Prefunctional testing:
 - 1. Visual and mechanical inspection:
 - a. Inspect for physical damage, defects alignment and fit.
 - b. Perform mechanical operational tests in accordance with Manufacturer's instructions.
 - c. Compare nameplate information and connections to Contract Documents.
 - d. Check tightness of all control and power connections.
 - e. Check that all covers, barriers and doors are secure.
 - 2. Electrical tests:
 - a. Circuit continuity: All feeders shall be tested for continuity. All neutrals shall be tested for improper grounds.
 - b. Determine that circuit breaker will trip under overcurrent condition, with tripping time in conformance with NEMA AB 1 requirements.
 - c. Test all circuit breakers with frame size 225 amps and larger and 10 percent of all circuit breakers with frame sizes less than 225 amps in each panelboard, distribution board, switchboard, etc. unless otherwise noted.
- D. Contractor shall replace at no costs to the Owner all devices which are found defective or do not operate within factory specified tolerances.
- E. Contractor shall submit the final test report for review prior to Project closeout and final acceptance by the Owner. Test report shall indicate test dates, devices tested, results, observation, deficiencies and remedies. Test report shall be included in the operation and maintenance manuals.

3.4 ADJUSTING

CIRCUIT PROTECTIVE DEVICES
SECTION 26 2800
3595001000

- A. Adjust circuit breaker trip settings for coordination with other overcurrent protective devices in system.
- B. Adjust circuit breaker trip settings for adequate protection from overcurrent and fault currents.

3.5 CLEANING

- A. Upon completion of Project prior to final acceptance the Contractor shall thoroughly clean overcurrent protective devices per Manufacturer's approved methods and materials. Remove paint splatters and other spots, dirt and debris.

- END OF SECTION -

PART 1 - GENERAL

1.1 SUMMARY

- A. This section describes the basic requirements for the fire alarm system work on this project.

1.2 REFERENCES AND STANDARDS

- A. California Fire Code (CFC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. American National Standards Institute, Inc. (ANSI): ANSI C62.41
- C. National Fire Protection Association (NFPA): 72, 101
- D. Underwriter Laboratories, Inc. (UL)
 - 1. UL 38; Manual Signaling Boxes Fire Alarm Systems.
 - 2. UL 268; Smoke Detectors for Fire Alarm Signaling Systems.
 - 3. UL 268 A; Smoke Detectors for Duct Application.
 - 4. UL 464; Audible Signal Appliances.
 - 5. UL 497B; Protectors for Data Communications and Fire Alarm Circuits.
 - 6. UL 521; Heat Detectors for Fire Protective Signaling Systems.
 - 7. UL 864; Control Units and Accessories for Fire Alarm Systems.
 - 8. UL 1424; Cables for Power-Limited Fire-Alarm Circuits.
 - 9. UL 1480; Speakers for Fire Alarm, Emergency and Commercial and Professional Use.
 - 10. UL 1481; Power Supplies for Fire-Protective Signaling Systems.
 - 11. UL 1638 Visual Signaling Appliances Standard.
 - 12. UL 1711; Amplifiers for Fire Protective Signaling Systems.
 - 13. UL 1971 Signal Devices for Hearing Impaired.
- E. International Engineering Consortium (IEC): IEC 60849
- F. Factory Mutual System (FM) approval guide: FM P7825

1.3 SUBMITTALS

- A. Product Data
- B. Operation and Maintenance (O&M) Manuals
- C. Field Test Reports

**FIRE ALARM SYSTEM
SECTION 26 6116
3595001000**

1.4 QUALITY ASSURANCE

- A. All materials, equipment and parts comprising the units specified herein shall be new, unused, and currently under production.
- B. Only products and applications listed in this Section and in the Electrical Drawings may be used on the Project unless otherwise submitted.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Products furnished by the Manufacturers indicated in the Electrical Drawings and this section shall be acceptable if in compliance with all features specified herein
 - 1. Gamewell-FCI
 - 2. System Sensor

2.2 CONDUIT AND WIRE

- A. Conduit:
 - 1. Conduit shall be in accordance with the California Electrical Code (CEC).
 - 2. Where required, all wiring shall be installed in conduit. Conduit fill shall not exceed 40 percent of interior cross-sectional area where three or more cables are contained within a single conduit.
 - 3. Cable must be separated from any open conductors of power, or Class 1 circuits, and shall not be placed in any conduit, junction box or raceway containing these conductors, per CEC Article 760-29.
 - 4. Wiring for 24-volt DC control, alarm notification, emergency communication and similar power-limited auxiliary functions may be run in the same conduit as initiating and signaling line circuits. All circuits shall be provided with transient suppression devices and the system shall be designed to permit simultaneous operation of all circuits without interference or loss of signals.
 - 5. Conduit shall not enter the fire alarm control panel or any other remotely mounted control panel equipment or back boxes, except where conduit entry is specified by the Life Safety Control Panel (LSCP) manufacturer.
 - 6. Connectors shall be compression type fittings to join EMT to a box or enclosure and to couple two ends of EMT conduit. Fittings shall be: Zinc plated, steel UL listed concrete tight, and threadless where connecting to conduit. Male hub threads -NPSM (American National Standard Pipe Straight Mechanical) where connecting to box or cabinet with steel locknuts.
- B. Wire:
 - 1. Wiring shall be in accordance with state and national codes (e.g., CEC Article 760) and as recommended by the manufacturer of the fire alarm system. Number and size of conductors shall be as recommended by the fire alarm system manufacturer, but not less than 18 AWG (1.02 mm) for Initiating Device Circuits

and Signaling Line Circuits, and 14 AWG (1.63 mm) for Notification Appliance Circuits.

2. All wire and cable shall be listed and/or approved by a recognized testing agency for use with a protective signaling system.
 3. Wire and cable shall be installed in conduit or metal surface raceway when in exposed spaces. Minimum size of conduit shall be 3/4" inch. Utilize Wiremold 700 series surface raceway (in lieu of conduit) for area where conduit cannot be installed concealed. Cable above accessible ceiling can be installed free air when using applicable cable. Support all free air cable every 48" with j-hooks.
 4. All field wiring (with exception of external communications Ethernet) shall be electrically supervised for open circuit and ground fault.
 5. The LSCP shall be capable of T-tapping NFPA Style 4 (Class B) Signaling Line Circuits (SLCs). Systems which do not allow or have restrictions in, for example, the number of T-taps, length of T-taps etc., is not acceptable.
- C. Terminal Boxes, Junction Boxes and Cabinets: All boxes and cabinets shall be UL listed for their use and purpose.
- D. The fire alarm control panel shall be connected to a separate dedicated branch circuit, maximum 20 amperes. This circuit shall be labeled at the main power distribution panel as FIRE ALARM. LSCP primary power wiring shall be 12 AWG. The control panel cabinet shall be grounded securely to either a cold water pipe or grounding rod. The control panel enclosure shall feature a quick removal chassis to facilitate rapid replacement of the LSCP electronics.

2.3 FIRE ALARM DEVICES

- A. Initiation: See Component Schedule in the Electrical Drawings for details
1. Addressable Heat Detector
 2. Addressable Smoke Detector
- B. Notification: See Component Schedule in the Electrical Drawings for details
1. Strobe
 2. Combination Speaker-Strobe

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Contractor shall thoroughly examine Project site conditions for acceptance of cabinets and enclosures installation to verify conformance with Manufacturer and Specification tolerances. Do not commence with installation until all conditions are made satisfactory.

3.2 INSTALLATION

- A. Wiring:

FIRE ALARM SYSTEM
SECTION 26 6116
3595001000

1. Individual input and output device addressability as well as remote sensitivity measurement, supervision and power shall all be performed on the same pair of wires. Wiring shall be Class B.
2. Each Class B initiating circuit shall consist of a two (2)-wire circuit. allowing a maximum of 20 T-taps and not requiring any end-of-line device for supervision. Each initiating circuit shall accommodate up to 75% of the manufacturers maximum addressable programmable initiating devices, to allow for future expansion.
3. Wiring for shielding certain conductors from others or routing in separate raceways, shall be as recommended by the Manufacturer's current requirements.
4. All wiring shall be installed in a continuous steel conduit or metal surface raceway when in exposed spaces. All conduit fittings shall be steel compression. Conduit shall be of the size recommended by the equipment Supplier with a minimum of 3/4" inch.
5. Wire color-coding shall remain the same throughout the system.
6. No wiring other than that directly associated with life safety/fire alarm detection, alarms, or auxiliary fire protection functions (no 120 VAC), shall be permitted in life safety/fire alarm conduits.
7. Make conduit and wiring connections to sprinkler flow switches, PIV's, sprinkler valve monitors, door hold-open/closure devices, smoke management fans, smoke dampers, elevator controller, emergency generator, etc.
8. All wiring shall be checked and tested to ensure that there are no grounds, opens or shorts.
9. All life safety/fire alarm junction boxes shall be color-coded and marked
10. Wire nut splices are not allowed.
11. Wires shall be numbered at each connection, termination, and junction point. Wire numbering tags shall be Brady Perma-Code, Westline or equal wire markers. Each group of wires shall be tagged with its destination at each panel, terminal box or junction box.
12. All wire used on the life safety/fire alarm and communication system shall have a minimum insulation rating of 105 degrees C. Bell wire or thermostat wire is not acceptable.

3.3 FIELD QUALITY CONTROL

- A. Pre-functional testing: Visual and mechanical inspection
1. Inspect for physical damage, defects alignment and fit.
 2. Perform mechanical operational tests in accordance with Manufacturer's instructions.
 3. Compare nameplate information and connections to Contract Documents.
 4. Check tightness of all control and power connections.
 5. Check that all covers, barriers and doors are secure.
 6. Visually check all sampling pipes to ensure that all joints, fittings, bends, sampling points, etc., comply with the Specification.

7. Check the air sampling system to ensure the following features are operational and programmed in accordance with the specification.
 - a. Alarm threshold levels
 - b. Pipes in use
 - c. Detector address
 - d. Clock and date
 - e. Time delays
 - f. Air flow fault thresholds
 - g. Display buttons operable
 - h. Check to ensure that all ancillary warning devices operate as specified.
 - i. Check interconnection with LSCP to ensure correct operation.
- B. Pre-functional testing: Electrical tests
 1. The system shall be completely tested prior to final acceptance testing. All points shall be tested from point of initiation to the final point or points of annunciation. All circuits shall be tested for continuity and ability to transmit the required signal correctly to the LSCP. Any problem due to wrong wire type, wire twist, impedance, mismatches, noise filtering or shielding shall be completely corrected during pretesting and prior to any final acceptance tests.
 2. Testing shall include each and every device in the system. Coordinate with other trades as necessary for testing.
 3. Tamper switches: Verify "trouble" signal is received and alarmed on closing of each valve.
 4. Smoke detectors and duct smoke detectors: Test with actual or approved artificial smoke. Verify that reset does not occur when devices are cleared of smoke. Verify supervisory circuit function. Perform pressure differential test on all duct-mounted smoke detectors.
 5. Intelligibility testing shall be per IEC 60849 and verified and tested by a third-party testing organization.
 6. Central station notification: Verify that one set of conductors in the terminal cabinet becomes a short circuit on any "trouble" condition and that the other set becomes a short circuit on any "alarm" condition. Verify that the conductor groups are labeled properly.
- C. Contractor shall replace at no costs to the Owner all devices which are found defective or do not operate within factory specified tolerances.

END OF SECTION

PART 1 - GENERAL REQUIREMENTS

1.1 OVERVIEW

- A. Copper cabling will be Panduit with a 25 year Pan-Net warranty.
 - 1. At project completion, the contractor shall present to owner a single project binder with electronic and hard copies of test results, as built drawings, pictures, bill of materials listing part numbers, etc. and a Visio 2007 drawing electronic provided to owner's Information Services and Educational Technology (ISET) office which identifies all Data jack locations and port assigned numbers.
- B. The installing contractor shall furnish and install all hardware, cables, devices, and other materials even though not specifically mentioned herein, which are necessary for the proper integration of the system so that the system shall perform the functions listed herein in compliance with all specified requirements.
- C. A Contractor may use up to ONE sub-contractor to install all CAT6 data cabling. Contractor will provide 'As Builts' and warranty information to ISET department.
 - 1. The contractor shall have a minimum of five years professional field experience pulling/terminating fiber and Cat6 cable.
 - 2. The contractor shall possess a valid C-7 California State contractor's license. This license shall have been issued two (2) years prior to the date of the bid. No other license classification is acceptable.
 - 3. The contractor and/or sub-contractors shall have Panduit Certified Installers as well as Corning Certified NPI Installers.
- D. The contractor and/or sub-contractors shall have at least half BICSI installers and one RCDD who will work on the project.
 - 1. The contractor shall provide a twenty-five (25) year application performance warranty for all Panduit Pan-Net copper cable and connectivity products. The system shall be installed to meet all TIA/EIA commercial building wiring standards and installed per appropriate Panduit instruction sheets. If any Panduit product fails to perform as stated above, Panduit will provide new components at no charge.

1.2 ABBREVIATIONS

- A. A.P. - Wireless Access Point
- B. AFF - Above the finished floor
- C. BKBRD - Backboard
- D. E.F. - Entrance Facility (formerly called MPOE or MPOP)

DATA COMMUNICATIONS
SECTION 27 1000
3595001000

- E. E.R. - Equipment Room. A building/campus serving facility connecting backbone to horizontal cabling and housing the building/campus' core system equipment.
- F. IDF – Intermediate Distribution Facility
- G. ISP - Inside Plant
- H. MAC - Moves, Adds, and Changes
- I. MDF – Main Distribution Facility
- J. MM - Multimode fiber
- K. NEXT - Near End Crosstalk
- L. OSP - Outside Plant
- M. SM - Single mode fiber
- N. T.R./T.E. - Telecommunications Room/Enclosure. A floor serving facility connecting backbone and E.R. to horizontal cabling in a region on each floor.
- O. TBB - Telecommunications Bonding Backbone
- P. TGB - Telecommunications Ground Buss Bar
- Q. TMGB - Telecommunications Main Ground Buss Bar
- R. U.O.N. - Unless otherwise noted

1.3 RELATED DOCUMENTS

- A. In addition to these specifications, the contractor shall reference the following drawings and documents:
 - 1. Architectural / Engineer drawings
 - 2. Detail Visio 2007 As Built Drawings and Diagrams.
 - 3. Any addendum, hereafter release of specifications
 - 4. Panduit Pan-Net 25 year Warranty
- B. Contractor shall ensure that, manufacture, ANSI/TIA/EIA-586-B cable testing, and install of the telecommunications cabling network is per manufacturer's requirements and in accordance with NFPA-70 (National Electrical Code®), state codes, local codes, requirements of authorities having jurisdiction, and particularly the following standards:
 - 1. ANSI/TIA/EIA-568-B.1 - Commercial Building Telecommunications Cabling Standard, Part 1: General Requirements
 - 2. ANSI/TIA/EIA-568-B.2 - Commercial Building Telecommunications Cabling Standard, Part 2: Balanced Twisted Pair Cabling Components
 - 3. ANSI/TIA/EIA-568-B.3 - Optical Fiber Cabling Components Standard

4. ANSI/TIA/EIA-569-A - Commercial Building Standard for Telecommunications Pathways and Spaces
 5. ANSI/TIA/EIA-606(A) - The Administration Standard for the Telecommunications Infrastructure of Commercial Buildings
 6. ANSI/TIA/EIA-607(A) - Commercial Building Grounding and Bonding Requirements for Telecommunications
 7. ANSI/TIA/EIA-758(A) Customer-Owned Outside Plant Telecommunications Cabling Standard
 8. ISO/IEC 11801:2002 ed 2- International standard for Class F (Cat7)
 9. IEC 61076-3-104:2002- International standard for RJ quad jack
 10. ISO/IEC CD14165-114 - International standard for duplex gigabit on two pair Ethernet
 11. TIA TSB 155 - 10G Ethernet over existing Cat6 up to 50 meters
 12. ANSI/TIA/EIA 565.B.2,10 - Standard for Cat6
 13. Cal/OSHA-Pocket Guide for the Construction Industry (recent edition)
- C. Contractor shall install cabling in accordance with the most recent edition of BICSI publications:
1. BICSI - Telecommunications Distribution Methods Manual (TDMM)
 2. BICSI - Cabling Installation Manual
 3. BICSI - Customer-Owned Outside Plant Design Manual
- D. Federal, state, and local codes, rules, regulations, and ordinances governing the work, are as fully part of the specifications as if herein repeated or hereto attached. If the contractor shall note items in the drawings or the specifications, construction of which would be code violations, promptly call them to the attention of the owner's representative in writing. Where the requirements of other sections of the specifications are more stringent than applicable codes, rules, regulations, and ordinances, the specifications shall apply.

1.4 PRE-INSTALLATION MEETING

- A. Schedule a meeting a minimum of five calendar days prior to beginning work.
- B. Agenda: Clarify questions related to work to be performed, scheduling, coordination, labeling for data jacks, data jack layout on telco racks in MDF and IDFs, etc.
- C. Attendance: Communications systems installer, general contractor, architects representatives, and other parties affected by work.
- D. A copy of manufacturer warranty application shall be provided at this meeting.

1.5 WARRANTY

- A. The project shall be pre-registered with manufacturer before installation has begun.
- B. The installation will have to pass scan tests by a certified contractor.

DATA COMMUNICATIONS
SECTION 27 1000
3595001000

- C. The installation will have to be documented with labels and drawings.
- D. A 25-year PAN-NET manufacturer warranty covering all components, equipment and workmanship shall be passed through in writing with system documentation. The warranty period shall begin on the system's first use by the owner.

1.6 APPROVED PARTS LIST

The following is an approved parts list:

Wire Management

Manufacturer	Part Number	Description
Panduit		J-Hooks shall be Panduit
Panduit	WMP1E	2U Horizontal Wire management
Panduit	WMPSE	1U Horizontal Wire Management
Panduit	CLT100F-C3	1" Split Loom Tubing Orange
Panduit	CLT188F-X3	1.88" Split Loom Tubing Orange
		1" Fiber Innerduct
		2" Fiber Innerduct
Panduit	CWF400N	4" Conduit Waterfalls
Panduit	CCMKIT1	Cable Management Kit
Panduit	WMPVHC45E	Vertical Cable Manager Front & Rear
Panduit	NCMH2	2U Horizontal Cable Manager Front & Rear
Trilobular		Taptite II thread

Twisted Pair Products

Manufacturer	Part Number	Description
Panduit	PUR6004BU-U	Cat 6 Riser Blue
Panduit	PUR6004WH-U	Cat 6 Riser White
Panduit	PUR6004OR-U	Cat 6 Riser Orange
Panduit	PUR6004RD-U	Cat 6 Riser Red
Panduit	PUR6004YL-U	Cat 6 Riser Yellow
Panduit	PUR6004VL-U	Cat 6 Riser Violet
Panduit	PUP6004BU-U	Cat6 Plenum Blue
Panduit	PUP6004WH-U	Cat6 Plenum White
Panduit	PUP6004OR-U	Cat6 Plenum Orange
Panduit	PUP6004RD-U	Cat6 Plenum Red
Panduit	PUP6004YL-U	Cat6 Plenum Yellow
Panduit	PUP6004VL-U	Cat6 Plenum Violet
General Cable	7136100	Outside Plant Cat 6
Panduit	CFPE1WHY	1 Port White Faceplate
Panduit	CFPE2WHY	2 Port White Faceplate
Panduit	CFPE4WHY	4 Port White Faceplate
Panduit	CFPE6WHY	6 Port White Faceplate
Panduit	CFP2SY	Stainless Steel 2 Port Faceplate
Panduit	CJ688TGWH	Cat 6 Jack White
Panduit	CJ688TGOR	Cat 6 Jack Orange
Panduit	CJ699TGYL	Cat 6 Jack Yellow
Panduit	CJ688TGBL	Cat 6 Jack Blue
Panduit	CJ688TGVV	Cat 6 Jack Violet
Panduit	CJ688TGRD	Cat 6 Jack Red

DATA COMMUNICATIONS
SECTION 27 1000
3595001000

Panduit	CPPL24WBLY	Blank, Minicom, 24 port patch panel
Panduit	CPPL48WBLY	Blank, Minicom, 48 Port Patch Panel
Panduit	SRBWCY	Strain Relief for Patch Panel
Panduit	PSL-DCJB	Black out Module Red (Need White, Red Listed)
Panduit	PSL-DCJB-IW	Black out Module White
Panduit	PSL-DCJB	Black out Module
Panduit	C4PPLK	Replacement Label Kit
Panduit	UTPSP3RD	3 Foot Cat 6 Red Patch Cord
Panduit	UTPSP5RD	5 Foot Cat 6 Red Patch Cord
Panduit	UTPSP3OR	3 Foot Cat 6 Orange Patch Cord
Panduit	UTPSP6OR	5 Foot Cat 6 Orange Patch Cord

Raceway

<u>Manufacturer</u>	<u>Part Number</u>	<u>Description</u>
Panduit	LD3WH6-A	LD3 Raceway (Substitute 6 with 8 and 10, for Longer Lengths)
Panduit	LD5WH6-A	LD5 Raceway (Substitute 6 with 8 and 10, for Longer Lengths)
Panduit	LD10WH6-A	LD10 Raceway (Substitute 6 with 8 and 10, for Longer Lengths)
Panduit	CFXWH-E	Raceway Coupler (Replace 'X' with 3, 5, or 10 for the different size raceway)
Panduit	RAFXWH-E	Right Angle Fitting (Replace 'X' with 3, 5, or 10 for the different size raceway)
Panduit	ICFXWH-E	Inside Corner Fitting (Replace 'X' with 3, 5, or 10 for the different size raceway)
Panduit	OCFXWH-E	Outside Corner Fitting (Replace 'X' with 3, 5, or 10 for the different size raceway)
Panduit	DCFXWH-E	Drop Ceiling Fitting (Replace 'X' with 3, 5, or 10 for the different size raceway)
Panduit	JBX3510WH-A	Single Gang Outlet for LD Raceway

Tools

<u>Manufacturer</u>	<u>Part Number</u>	<u>Description</u>
Panduit	CGJT	
Panduit	EGJT	
Panduit	CWST	
Panduit	CJAST	
Panduit	TTS-20R0	Tak Tape Rolls
Panduit	HLS-75R0	Bulk Velcro

DATA COMMUNICATIONS
SECTION 27 1000
3595001000

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. The acceptable manufacturer for the cabling connectivity is Panduit/General copper or Panduit/Panduit copper.
- B. Part listed are the owner's standards and any substitutions shall be approved in writing through submittal.
- C. Panduit 25 year Pan-Net.
- D. Corning Cable

2.2 QUANTITIES

- A. Distances mentioned and shown on drawings or spreadsheets are approximate. Field verification shall be made prior to install.
- B. Quantities listed here and in "parts list" document take precedence over drawing quantities.

2.3 SYSTEM COMPONENTS

- A. Materials provided shall meet or exceed the standards/description listed below.
- B. Horizontal Cable (Cat6):
 - 1. Solid copper, 24 AWG, 100 balanced twisted-pair (UTP) Category 6 cables with four individually twisted-pairs, which meet or exceed the mechanical and transmission performance specifications in ANSI/TIA/EIA-568-B.2 to 250 MHz. General Cables Genspeed 6000 Enhanced CAT6E meets the specification.
 - 2. Use plenum rated cable in PLENUM air environments only.
 - 3. Use gel-filled or other outdoor plant cables in OSP environments as under slab concrete, outside near water, etc.
- C. Connectors (Cat6):
 - 1. 8-pin modular, category 6, pinned to T5689B standard.
- D. Faceplates:
 - 1. Provide 1, 2, 4 or 6 port faceplates and use classic style with label window. Fill unused ports with blank inserts.
- E. Patch Frames:
 - 1. Data frame is to be 19" rack mountable, 24 or 48 empty ports for 8-pin modular jacks. Panels shall include a window for labels. Note: unused ports are to be filled in with black blank inserts.
- F. Wire management:

1. On racks the horizontal cable managers shall be Panduit center mounting brackets (WMPF1E) for the wire managers in front for easy access during MACs. Horizontal managers shall be a minimum 1 RU.
2. Vertical cable managers (WMPVHC45E) are to be same height as rack. With fingers in the rear and in the front. They shall to have a bend radius control or strain relief clips. Panduit vertical managers are to be used for extra capacity.
3. Cable runway shall be ladder style or mesh /solid cable tray with a 12" width and 4" depth. The runway shall be mounted to a support loading wall as well as supported to the rack. An angle transition shall be used for adjoining runways or 90 degree bends. A cable drop shall be used to protect cables transitioning from runway to point of termination. If using a ladder style, use cable fingers attached to the sides to prevent spilling of cable over the sides.

G. Cable Pathways:

1. J-hooks will be used for suspending cables. These hooks shall have a 50 cable capacity and optional mounting. Preferred hooks have a wheel attachment capability so cables will not be dragged across during installation. Ensure that bends and edges will not pinch or cut cable sheath. Provide enough J-hooks to keep pathway along walls, J-hooks shall not cross the room.
2. Penetrations through fire rated walls shall utilize a metallic assembly with fire stop built into the assembly. EZ Path mechanical fire stop by Specified Technologies meets this requirement and shall be used. There is no exception to this.

H. Miscellaneous:

1. Cable ties shall be Velcro with a loop strap. Nylon cable ties shall not be used. If they are they shall be black and strapped with a loose tie so as not to pinch the cable sheath and with enough slack to get snips and fingers between tie and cable. The end of the tie shall be cut off after strapping.
2. Labels for patch panels, faceplates, and cables shall be by one manufacturer. Ex: Label Ware, EasyMark, Brady, LabelMo, etc.
3. All conduits shall have a maximum fill ratio of 60%.
4. All labels including the cable label shall be laser printed.
5. Labeling (Wire and Wall Jacks): All Labeling shall follow the "Tracy U.S.D. Labeling Format" (See "Tracy U.S.D. Labeling Format" Spreadsheet) with exception of workstation cables (i.e. patch cords). Hand written labels are not acceptable. All labels shall be machine printed black lettering on opaque white tape, stenciled onto adhesive labels, or type written onto adhesive labels. The font shall be at least one-eighth inch (1/8") in height, block characters, and legible. Patch panels shall be assembled and terminated in a sequential order, exhibiting room and workstation numbers for all workstations served by the MDF or IDF.
6. Each fiber optics cable segment shall be labeled at each end with its respective IDF identifier. Each fiber interconnect device shall be labeled with its respective IDF identifier.
7. Each telecommunication outlet shall be labeled with its respective workstation number respective (machine labels only).

DATA COMMUNICATIONS
SECTION 27 1000
3595001000

8. Workstation Terminal Outlets are to be installed within single-gang or double-gang electrical boxes. No mud-rings are to be used. WAO faceplates are to have labeling which identifies connected IDF.
9. Each copper backbone cable shall be machine labeled and printed EIA/TIA-606 Section 8 compliant only at each end with its respective IDF number/letter. Each binder group shall be tied off with its respective identifying ribbon at each breakout point.
10. Labeling will be completed before testing shall begin; discrepancies during inspection with the labeling will void all test results.

2.4 PROJECTOR

1. Contractor shall furnish and install Epson Brightlink 1485Fi and associated Epson Pilot control pad.

PART 3 - EXECUTION

3.1 SYSTEM SPECIFIC INSTRUCTIONS

A. Horizontal Cable:

1. Contractor shall label cables in 2 locations 12" apart.
2. Contractor is to terminate using the 568B pin out.
3. Contractor is to leave 10 feet of slack for all cables at the station in the accessible ceiling.
4. All cables will terminate at the stations with RJ45 connectors and shall be housed in a faceplate. If the connector is in the ceiling or behind a faceplate (such as the AV control panel) the connector shall be installed in a surface housing.

B. Closet/Rack:

1. All cables will terminate on the rack on a modular patch panel with an RJ45 connector.
2. A horizontal manager shall be installed above and below every 48 ports of patch panels (CPPL48WBLY) and switches.
3. A service coil shall be created above the rack on the wall of the closet. Do not place a service coil within the vertical and horizontal wire management. Cables within those managers shall be kept straight with proper bend radius.
4. The service coil shall be long enough to reach the farthest corner of the room and then down to the floor.
5. Patch frames shall be rack mounted using grounding screws and washers.
6. Note: unused ports on the patch frames are to be filled in with black blank inserts. Also, 1-2 blanks will be installed after each student data, teacher, admin, ceiling, and paging outlet with less than 4 cables to allow for future MACs.
7. Contractor shall place a drawing next to the data rack showing a floor plan with outlet locations and labels that match the rack labels. These drawings are to be laminated or in a plastic casing.

3.2 INSTALLATION PROCEDURES

- A. The following are installation practices that ensure superior performance and aesthetics.
- B. NOTE: References to conduit, raceway and electrical are for contractor's information. Actual installation of these components is included in another specification. If contractor notices a difference between actual install and the specs below, the contractor shall bring that immediately to the attention of the electrical engineer.
- C. Work Area Outlet
 - 1. The 10 ft coil shall not be a traditional service loop. Rather, the cable shall be extended along the wall then brought back at a lower height.
 - 2. A pull string for MACs shall be pulled with cable into accessible ceiling space or length of conduit. *Label strings to indicate destination of conduit.*
 - 3. Fill and label faceplates starting in the top left then moving right and downward.
 - 4. In addition to labeling, jacks shall be quickly identifiable by the following color:
 - a. Paging Jack Blue
 - 5. All jacks are to be terminated using 568B pin assignment.
 - 6. Minimize the amount of untwisting in a pair as a result of termination to connecting hardware. The amount of twisting shall not exceed 1/2" for category 6 and higher cables. Cable sheath shall touch the back of jack after termination (leave no portion of the cable exposed).
 - 7. A classic series faceplate (or surface mount box if needed) with a label window shall be used or the Jack itself labeled (Easy Mark #PLL-46-Y3C-1 or equal).
 - 8. The cable behind the faceplate shall also be labeled to match faceplate.
 - 9. ALL labels are to be machine generated, laminated, and adhesive.
 - 10. Each faceplate shall be labeled with its respective workstation number.
- D. Cable Pathways
 - 1. Acceptable Pathways:
 - a. All horizontal cable shall have support, the cable shall never be lain freely and resting on structural supports nor shall they use ceiling grid or lighting support wires.
 - b. The pathway to the work area shall allow for a minimum of 3 cable runs per individual work area.
 - c. Pathways shall ensure that a maximum pulling tension 25 lb-f is not exceeded and pathways (or installers) shall not deform the cable jacket. *If cable becomes kinked, contractor shall replace the cable.*
 - d. Acceptable pathways are: cable tray, j-hooks, conduit, and surface mount raceway. No floor mounted boxes.
 - 2. J-hooks - responsibility of cable installer
 - a. Cables shall not be attached to ceiling grid or lighting support wires. Instead cable pathway shall be along walls. Cables shall never cross a room. The

DATA COMMUNICATIONS
SECTION 27 1000
3595001000

pathway shall always be along a wall. This makes for easier MAC as any tile next to a wall can be moved to access.

- b. For large quantities of cables (50 to 75) that converge at the TR and other areas, provide cables trays that are specifically designed to support the required cable weight and volume. When more than 50 cables are in a pathway j-hooks shall not be used or a second pathway shall be created. (NOTE: It is recommended that no more than 25 UTP Cat6 cables be placed in a single J-hook).
 - c. If cable tray is used follow manufacturer guidelines for installation and use a product that is designed specifically for communications cabling. The depth of the tray shall not exceed 4".
 - d. When using J-hooks, locate them staggered between 4 ft to 5 ft to adequately support and distribute the cable's weight. Do not evenly space the hooks, vary between 4 to 5 feet between each hook to prevent signal disruption.
 - e. When using J-hooks install cable with a wheel pulley system that will remove after cable is in place.
 - f. Contractor shall not strap the cables in between hooks to enable easier MACs and to lessen possibility of alien crosstalk.
3. Conduit
- a. When pulling through conduit, cable pulling lubricants shall be continuously applied to all cables and be specifically approved by the cable manufacturer.
 - b. Pull string shall be installed in conduit to allow future MACs. If more than one string is installed in a conduit, the strings shall be labeled for identification of destination.
 - c. Conduits shall have grommets on end to protect the cable.
 - d. No more than (2) 90 degree turns in a given length
4. Fill capacities
- a. Cable pathways shall not be filled greater than the NEC maximum fill for the particular pathway type.
 - b. The fill cable capacity for conduit shall not exceed the following and be no more than 60% full:
 - 1) 1/2 " 0 – Do not use
 - 2) 3/4 " 0 – Do not use
 - 3) 1" 4 – Do not use
 - 4) 1 1/4 " 6
 - 5) 1 1/2" 8
 - 6) 2 " 12
 - 7) 2 1/2 " 16
 - 8) 3 " 24
 - c. Fill capacity for raceway: (See Manufacturer Specs and Size by Cat6 requirements or 8.4mm/.33in diameter cable)
5. Distance Limitations

- a. Horizontal cable distance (Outlet to Panel) is not to exceed 298 feet.
 - b. Premise cable distance (Outlet to Panel) shall be no less than 55 ft for any cable installed. Coil excess in ceiling if physically closer than 55 ft.
6. Aerial cable shall not be utilized.

E. Bend Radius Limits

1. The minimum bend radius for copper cable 4x cable diameter which is approximately 1.24 inches (31 mm).
2. The minimum bend radius for indoor (ISP) backbone optical fiber when under no load is 10 times the cable diameter and while it is being pulled it is 15 times.

F. EMI Avoidance

1. Cabling shall be installed to avoid devices that cause electromagnetic interference, such as Microwaves, Refrigerators, lighting, ballasts, power panels, etc.
2. Keep a minimum of 6" from electrical conductor cable.
3. Telecommunications conductors shall not be routed closer than 6 ft. from any lightning protection system conductor.

G. Cabinets and Racks

1. Only black Velcro cable ties shall be used for bundling and routing. Bundles shall be loose and Velcro ties shall have at least 18 inches between and the bundle shall be loose enough to place two fingers between the cable and the ties.
2. The service coil at the rack shall be located above the rack on the ladder rack/cable tray system or on the wall. Do not place the service coil within the vertical and horizontal wire management.
3. Entrances to cabinets shall be protected with grommets and shall have a conduit stubbed to ceiling space.
4. Installer shall create a detailed floor drawing designating jack locations and labels. A copy shall be attached inside the cabinet or back wall of the rack. The drawing shall also have the date and contractors contact information.
5. Installer shall ensure that every telco rack/cabinet shall have separate and individual patch panels for workstation data cabling for each classroom, office or room space. In-addition, separate and individual patch panels shall be installed for each individual system such as: Extron A/V, Valcom IP Paging, Security Surveillance, and Wireless Access Point devices.

H. Wire Management

1. When bringing cable into the data rack, keep the bundle size small (optimum size may be 12 cables no more than 24 cables).
2. Velcro Ties shall be used in place of cable ties. Do not cinch cables so tightly to deform the cable in any way. It is recommended to leave Velcro ties loose enough to get fingers in between without deforming cable. Velcro ties shall be placed no less than 18 inches from other Velcro straps.

DATA COMMUNICATIONS
SECTION 27 1000
3595001000

3. Every 48 ports of patch frame shall have its own wire manager below and above (except angled patch frames). The manager shall be d-rings on the front for easy access for MACs. Rear management shall also be used and may be finger style or bar style.
4. In addition to the horizontal managers, the installer shall either install a vertical (WMPVHC45E) Panduit center mounting brackets for the wire managers for vertical management.
5. In addition to binding in Velcro ties, ring runs shall be used for cables run in corners and for drop and rise on walls. These bundles shall be labeled indicating the destination of the bundle (i.e. floor horizontal cables, to TR2, etc.).
6. When cable bundles transition from wall to a floor rack a cable tray or ladder rack shall be utilized. Install brackets on sides to prevent cables from falling off the rack if ladder rack is used.

I. Fire stopping

1. All procedures in this category shall be done in accordance with authority having jurisdiction (AHJ), local codes, CEC, and insurance underwriter's requirements. If a procedure in one of these effects performance, the AHJ shall be alerted immediately in writing.
2. Ensure that materials used are U.L. Listed.
3. For sleeves through ALL walls, EZ Path by Specified Technologies shall be used to ensure a fire stopped pathway on future MAC.
4. Contractor shall put a label per ANSL11A/EIA 569 with warning to not remove, company name and phone number, and date next to each penetration. Contractor shall also place a label stating how many cables can fit within the EZ Path. If initial install fills the firestop, the label shall read "Capacity full — DO NOT ADD CABLES". Do this labeling and take a picture to include in close out docs. Cabling will not exceed 60% fill.
5. If the firestop capacity is filled more than 85% during initial install, contractor shall install an additional EZ Path.

J. Grounding and Bonding

1. All network equipment, shielded cables, patch panels, racks, and tray/ladder rack segments shall be Bonded and Grounded according to TJNEIA 607, BICSI guidelines, CEC, insurance underwriter's requirements, and local code (AHJ). The purpose is to provide a path to ground for all components to ensure personal safety and equipment protection.
2. Ensure that materials used are U.L. Listed.
3. Conduits that contain grounding backbone conductors shall be bonded to the grounding conductor at each end of the conduit. This negates the high impedance choke" effect while the cable carries lightning currents.
4. All racks, trays, and electronics shall be grounded.
5. Contractor shall install on rack an ESD Port Kit on each rack in front and back.
6. The use of aluminum conductors is discouraged in the establishment of grounding scenarios. Aluminum does not provide the lowest resistive path. Additionally,

aluminum conductors can become loose from mechanical screw/bolt connections due to vibration from carrying AC current.

7. Panduit's Data Center Grounding Solution and components shall be used. The following components shall be used to form a complete system (see the detailed drawing): Cabinet Grounding Complete Kit, Common Bonding Network Jumper (CBN) Kit, Surge Suppressor Jumper Kit, Front to Back Rail Jumper Kit, Rack Ground Strip Kit, Grounding Bus bar Kit, Paint Piercing Grounding Washers Kit, Thread Forming Screws, and Electrostatic Discharge (ESD) Discharge Port Kit.
8. Contractor shall test the ground system to ensure it has less than 5 Ohms. The test results shall be documented and submitted in close out docs.
9. Documentation: Contractor shall provide a single set of documentation to include test results and Visio "As-built" drawings in both soft copy and hard copy format.
 - a. Workstation Cable: The results of the workstation cable tests shall be provided in the form of printouts from the test equipment as well as computer file copies on CD with the software to read the results included. Test results shall be in PDF format.
 - b. As-Built Drawings: Contractor shall produce drawings depicting data outlet locations as they are actually installed. The drawings shall indicate actual cable routing, work station locations and workstation numbers, to be submitted before final inspection for punch list. Incorrect Visio drawings are punch list items and are to be corrected before re-inspection. "Tracy Unified School District's Telecommunications Jack Legend" shall be applied to all drawings. Results shall be returned to ISET within 30 days.

3.3 TESTING

- A. Testing shall be done with a Fluke Level IV cable tester (DTX 1800 meets this specification) and an Optical Time-Domain Reflectometer (OTDR). The new Fluke DTX 1800 unit is one test set that is capable of testing all frequencies through 900 MHz. If another manufacturer provides this test, contractor shall submit spec sheets and receive written approval for the tester prior to testing.
- B. Contractor shall ensure that the tester has been manufacturer calibrated within nine months of testing and has the latest software version downloaded.
- C. Prior to testing, the tester shall be set for the specific cable and jack used on the project.
- D. A summary test report shall be submitted as well as detailed reports for each cable.
- E. All test results shall have the individual cable label and project name in the header along with the date and time of testing.
- F. Test results shall clearly indicate a Pass or Fail on the report. If a cable fails in one parameter the test is considered a Fail. Marginal Pass cables (indicated with an asterisk) are not acceptable and will be considered as a Fail.
- G. Any cable damaged or exceeding recommended installation parameters during installation shall be replaced by the contractor prior to final acceptance at no cost to the Owner.

DATA COMMUNICATIONS
SECTION 27 1000
3595001000

- H. Test reports shall show a pass result for network standards, continuity, length, cross-talk, attenuation, and ambient noise.
- I. No Splices will be accepted.
- J. An optical time domain reflectometer (OTDR) test will be required on the existing fiber pathways prior to the work commencing and on conclusion of the work. District IT will provide final acceptance of the OTDR test results and sufficiency.

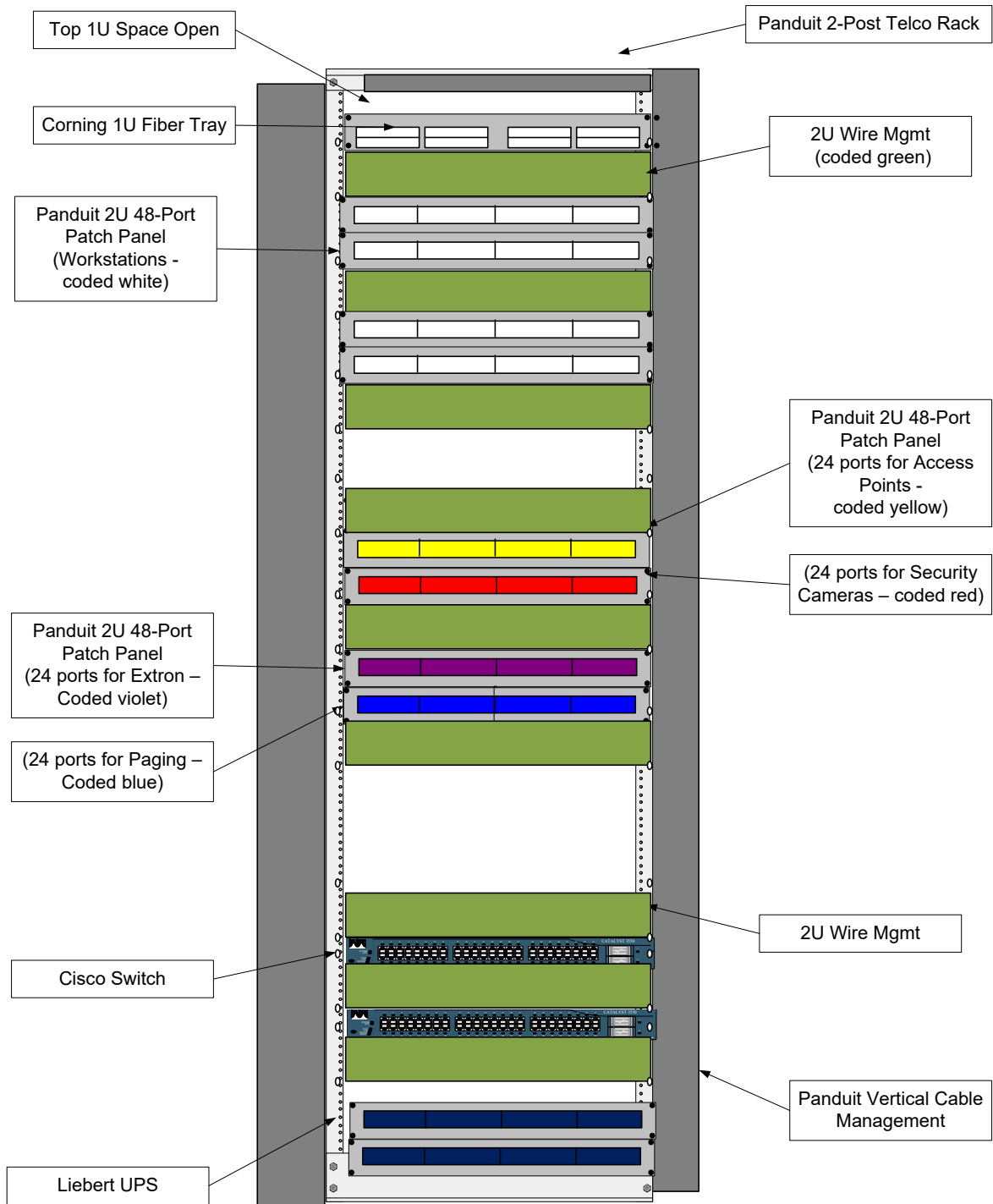
3.4 EXAMINATION /FIELD QUALITY CONTROL

- A. On a daily basis, the contractor's project manager shall inspect the installation to ensure that installers are following the specifications and quality craftsmanship.
- B. Throughout the project regular interval inspections will be completed by an architect representative to eliminate "unchangeable" installations.
- C. If the representative inspects the site and makes a change to the design or installation, this shall be noted in writing. The contractor shall not complete this change until approval is given.
- D. After installation, the architect representative will first inspect the site and create a closeout punch list for contractor to complete.
- E. After completion, the representative and contractor will inspect the site together.

3.5 IDENTIFICATION

- A. The labels are to be laser printed onto adhesive labels using software and labels by Label Ware, Easy Mark, Brady, LabelMo, etc.
- B. Each cable is to be labeled using the following pattern: XXX-A##
 - 1. Segment XXX: Designates the location where the other end of the cable is. That is, at the station it says what room the patch panel is, and at the patch panel it says what room the station is.
 - 2. Segment A: Designates which patch panel the cable is terminated. This allows 26 patch panels per closet.
 - 3. Segment ##: Designates which port on the patch panel the cable is terminated.
- C. Segment A and ## shall be the same on both sides of the cable.
- D. Contractor is to place labels onto the faceplates and panels. In addition, contractor shall place an adhesive label on each end of the cable.
- E. Layout of an IDF rack (*not to scale*). Rack height shall be 72".

**DATA COMMUNICATIONS
SECTION 27 1000
3595001000**



F. Labeling Format

1. All data cables at both the patch panel and the data jacks shall be labeled using the following standard labeling format. The labels are to be laser printed onto

DATA COMMUNICATIONS
SECTION 27 1000
3595001000

adhesive labels using software and labels by Label Ware, Easy Mark, Brady, LabelMo, etc.

2. Telecommunication outlets for a Valcom IP Paging horn, speaker or clock/speaker shall be labeled with its respective Valcom IP device number (machine labels only). Valcom numbers shall be comprised of the room number (i.e. C1, C2, etc.) and Valcom IP device number/drop number (i.e. PA1, PA2, etc.). Each data cable at a telecommunications outlet shall have an alpha identifier for the data jack (i.e. A). No biscuit shall be used and the data jack should be placed inside the Valcom back box. The labeling will start from the main door entering the room and go clockwise around the room. Each workstation cable shall be neatly labeled at each end with its respective workstation number.
3. Labeling for the respective port on the MDF/IDF patch panel shall be:
 - a. C1 – PA1 – A

3.6 CLEANING

- A. All work shall be cleaned to remove all dust, dirt, grease, paint or other marks. All electrical equipment shall be left in a clean condition inside and out, satisfactory to the owner. Keep buildings and premises free from accumulated waste materials, rubbish and debris resulting from work herein, and upon completion of said work, remove tools, appliances, surplus materials, waste materials, rubbish debris, and accessory items used in or resulting from work and legally disposed of offsite. For lead and asbestos dust removal, refer to "Safe School Standards" documentation.

3.7 CLOSEOUT

- A. The contractor will submit to owner within thirty days of completion a closeout package containing:
 1. Hard copy and electronic test results.
 2. Hard copy and electronic as-built drawings with labels (with extra copies to be posted in the E.R. and T.E.s).
 3. Warranty information and manuals.
 4. A bill of materials with part numbers to be used for later MAC.
 5. Hard copy and electronic pictures.
- B. As prerequisite to final acceptance, supply to the owner certificates of inspection from IOR and owner designated RCDD.

- END OF SECTION -

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. Furnish and install new IP devices into existing IP Sound/Communications System with clock subsystem, including all wiring and connections and other materials as shown on Plans and specified herein. It is the intent that complete operating systems be installed and that any power supplies, transformers, modules, cards, cages, programming, or other items required to achieve this end result shall be furnished whether or not such item or items are specified herein.
- B. IP School Application VoIP equipment supplied by Valcom, Inc. shall be considered as meeting all specification requirements and the District's standards.
- C. The system shall provide distribution of intercom, overhead paging, emergency paging, class change time tones and emergency tones.
- D. System shall be UL 813 and FCC Part 15 listed for safety reasons. Systems not listed are not acceptable.
- E. Site and System Investigation: Sound/Communications System bidder shall visit site prior to bid and become thoroughly knowledgeable about existing system and work required to perform work of this section. Failure to discover the equipment, materials, and labor required to complete the extensions will not relieve the contractor from completing the work at no additional cost.

1.2 GENERAL REQUIREMENTS

- A. System Requirements: All of various equipment components to be complete with all appurtenant accessories required to provide specified facilities and perform specified functions throughout presently planned construction and space; and provisions for expanding system to provide same facilities, and perform same functions in all future planned construction, including space and mountings in consoles and terminal backboards.
- B. Equipment Tests and Standards:
 - 1. For all equipment operating at 26 volts or more, or utilizing over 50 watts, Contractor to submit proof within time allowed for submittals that all items of equipment will conform to requirements of U.L. Label or listing of equipment by U.L. to be accepted as evidence of conformance.
 - 2. For all items of equipment operating at 25 volts or less, and utilizing less than 50 watts, Contractor may submit, in lieu of such label or listing, written certificate from any nationally recognized testing agency, adequately equipped and competent to perform such services, that each item has been tested and conforms to U.L. standards, including method of test of U.L.
- C. Instructions and Manuals:

SOUND AND COMMUNICATIONS

SECTION 27 5123

3595001000

1. Equipment supplier of systems to demonstrate operation of systems to satisfaction of Owner and furnish Owner three (3) wiring schematics and a list of MAC addresses for all items of equipment, installation instructions, and details of all routine maintenance and servicing which must be given systems by Owner. Manuals shall be provided in 3-ring binders, with title page, list of contents, and conspicuous label on cover and shall be delivered to District. Submit copy to Architect for approval before delivering to Owner.
2. Supplier shall demonstrate operation of systems and provide training to all end users, administrative staff, and system administrator. Coordinate times of instruction with District, at District's convenience. Supplier shall provide a minimum of 2 hours of user instructions to clerical staff and 4 hours of user/maintenance instructions to District maintenance personnel. Instruction periods shall not coincide and shall be scheduled with District, not school staff. District shall provide list of authorized personnel for training sessions.

D. Submittals:

1. Refer to Section 27 1000.
2. Contractor shall submit name of firms he proposes to do work under this Section, addresses, phone numbers, and name of firm's contact, for approval. Such firms shall be factory authorized representatives of the existing system and submittal shall include manufacturer's letter of confirmation. Proposed firm shall furnish all equipment and specialty cables, make all connections to same, and place the systems in operation. Such firms shall have offices and service departments within a 100 mile radius of project and shall have been in business of this type for at least five years.

E. Record Drawings:

1. Final Inspection will not be made until drawings are received and approved. Record Drawings shall include "As-Built" one-line and wiring diagrams, with terminations identified, wire color coding schedule, pullbox locations, and conduit routing plans.
2. The Contractor shall provide complete drawings detailing all interconnections and panel wiring diagrams in Visio 2000 format.

F. Guarantee:

1. One firm to assume full responsibility for performance on all work of this section. Guarantee all equipment against defects in material and workmanship for two (2) years, and provide on-the-premises service during normal working hours for two years, at no cost to Owner if trouble is not caused by misuse, abuse, or accident, or at current labor rates if so caused. Provide manufacturer's written one-year guarantee for equipment and parts to Owner.
2. Service shall normally be available within 24 hours from service department of authorized distributor of manufacturer by factory trained servicemen.
3. On-the-premises service at other than normal working hours to also be available, but labor charges for such calls to be paid by Owner at current labor rates.

PART 2 - DETAIL REQUIREMENTS AND PRODUCTS

2.1 SOUND/COMMUNICATIONS SYSTEM

- A. General: Install new IP devices into existing IP Intercommunications System.
- B. Exceptions to these specifications are not acceptable. Substitutions are not permitted.
- C. Verify existing server is provided and programmed. Server shall be Valcom VE6025, or similar.
- D. Provide station ports as required – Valcom VE8012BR.
- E. Equipment Standards:
 - 1. All enclosures for all equipment to be of metal throughout system. Enclosures other than metal are not acceptable.
 - 2. Speaker grilles to be non-directional diffusion type insulated from speaker by fiber mounting board. Dampening material to be installed between mounting board and grille to prevent metallic resonance.

2.2 SYSTEM CABLING

- 1. Each clock/speaker and speaker shall have a Category-6 cable homerun from the local data rack. The cable shall be terminated on a jack or directly wired to the device within the provided enclosure.
- 2. Electronics contractor completing this specification shall provide the patch cord for connecting the speaker to the jack. Contractor shall provide a 1 foot (or shorter) blue patch cable.
- 3. Refer to Section 27 1000 for wiring requirements.

2.3 REMOTE EQUIPMENT

- A. Combination Clock/Speaker: Valcom VE4031A-A with VB-R19 recess mounting backbox.

PART 3 - EXECUTION

3.1 INSTALLATION REQUIREMENTS

- A. Electrical Contractor shall retain the services of the duly appointed representative as specified hereinbefore, who shall furnish all equipment, make all connections to same, and place system in operation. Technician and workman employed shall be particularly skilled in this type of work. Workmanship on installed systems shall be of professional quality, best commercial practice.
- B. All wiring throughout entire system shall be installed in conformance with standard industry practice.

SOUND AND COMMUNICATIONS
SECTION 27 5123
3595001000

- C. Station locations shall be identified by location and school's actual room numbers as furnished by District, and in all ways shall relate as closely as possible to record wiring drawings. Prior to performing final labeling and programming, coordinate information with District.

3.2 CONSTRUCTION MEETINGS

- A. The Contractor shall schedule construction meetings at the jobsite as follows:
 - 1. Prewire meeting shall occur after raceways are installed and prior to pulling of any wire or cable.
 - 2. Pre-termination meeting shall occur after wire and cable has been installed and prior to termination.
- B. Meetings shall be scheduled by the Contractor on a building by building basis and shall include the Project Inspector, School's Representative, the electrical subcontractor, and the Signal System subcontractor as a minimum.

3.3 TESTS

- A. After all equipment specified herein has been installed and is in operating condition, performance tests shall be conducted to determine that installation and components comply with these specifications. Contractor shall furnish competent personnel for these tests.
- B. Perform initial programming of system and audio level adjustments.
- C. Contractor shall physically walk to each speaker and ensure that sound is coming from each speaker.
- D. Contractor shall set the volume level to approximately 6 dB above ambient noise during occupancy.
- E. The sound level for each speaker and zone shall be tested with an audio meter.
- F. Contractor shall provide a drawing showing dB levels for each speaker and zone. The drawing shall be dated and signed by the person administering the test.
- G. Contractor shall test the extension for each room. Extension also be noted on the drawings.
- H. Testing shall be scheduled with the Owner and shall occur after receipt by Architect of Contractor's written certification of completion, record one-line diagram, wiring diagrams, maintenance and operation manuals, and other "As-Built" data required by these specifications. Tests shall be scheduled with School before occupancy occurs.

- END OF SECTION -

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. Furnish and install extensions to the existing Intrusion Alarm System including all wiring and connections and other materials as shown on Plans and specified herein. It is the intent that a complete operating system be installed and that any power supplies, relays, resistors, cards, modules, programming, or other items required to achieve this end result shall be furnished whether or not such item or items are specified herein.
- B. Site and System Investigation: System bidder shall visit site prior to bid and become thoroughly knowledgeable about existing system and work required to perform work of this section. Failure to discover the equipment, materials, and labor required to complete the extensions will not relieve the contractor from completing the work at no additional cost.
- C. Proprietary Systems: Where school is protected and monitored by a proprietary system, such as ADT or Sonitrol, Contractor shall coordinate the exact requirements with those firms. If the Division 16 Contractor elects to use a sound and signal firm other than the proprietary company, the sound and signal firm must include in bid, the materials, equipment, and labor required by the proprietary company to make the extensions complete and fully functional.

1.2 GENERAL REQUIREMENTS

- A. System Requirements: All of various equipment components to be complete with all appurtenant accessories required to provide specified facilities and perform specified functions throughout presently planned construction and space; and provisions for expanding system to provide same facilities, and perform same functions in all future planned construction, including space and mountings in control panels and terminal backboards.
- B. Interruption of Service: Existing intrusion alarm system must be kept operational during unoccupied hours. In the event that the system or portion of system is nonoperational during off-hour periods as a result of work of this contract, the Contractor must provide guard(s) to patrol the campus. Guard(s) and guard duties proposed by Contractor must be acceptable to District and District Police (local enforcement if District does not have its own Police Services). All costs for security guard(s) shall be Contractor's responsibility.

1.3 QUALITY ASSURANCE

- A. Work shall be performed in accordance with all applicable requirements of the edition indicated on the drawings of all governing codes, rules and regulations including but not limited to the following minimum standards, whether statutory or not:

**INTRUSION ALARM SYSTEM
SECTION 28 3100
3595001000**

1. California Electric Code (CEC)
2. California Fire Code (CFC)
3. National Fire Alarm Code with California Amendments (NFPA 72)
4. Title 3 of the Americans with Disabilities Act
5. Titles 19 and 24 of the California Code of Regulations

1.4 CONTRACTOR QUALIFICATIONS

- A. Fabricator/Installer/Vendor shall be licensed contractor and servicing agent, as well as installer for all components and systems in this System, and be acceptable to manufacturer of the major components of the system. Service personnel shall be capable of serving any and/or all components of the System.
- B. Fabricator/Installer/Vendor must be able to present evidence of technical expertise, be a firm who has successfully installed projects of a similar scope to this project for a minimum of five (5) years, and shall maintain service office within 100 miles of the project site.
- C. All equipment is to be manufactured by a firm/firms who have successfully fabricated elements/systems of a scope similar to this project for a minimum of ten (10) years.
- D. Have a valid State of California Contractor's license in classification C10 - Electrical.
- E. Provide authorized dealer service on-site at facility within four (4) hours of a problem being reported, with this response time available twenty-four (24) hours per day, seven (7) days per week.
- F. Affirm that he maintains, or will maintain, or has access to, a stock of system spares sufficient to ensure that no element of the System will be out of service for more than twenty-four (24) hours due to lack of proper spares.

1.5 SUBMITTALS, O&M'S AND RECORD DRAWINGS

- A. Submittals:
 1. Contractor shall submit name of firm he proposes to do work under this Section, addresses, phone numbers, and name of firm's contact, for approval. Such firms shall be factory authorized representatives of the system and submittal shall include manufacturer's letter of confirmation. Proposed firm shall furnish all equipment and specialty cables, make all connections to same, and place the systems in operation. Such firms shall have offices and service departments within a 100 mile radius of project and shall have been in business of this type for at least five years.
 2. Submittals shall be complete and include catalog data, shop drawings, one-line diagrams, battery calculations, voltage drop calculations, and scaled plan

drawings. Building plans shall be 1/8"=1'-0", and site plans shall be no smaller than 1"=40'.

3. Shop Drawings shall contain complete wiring and schematic diagrams for equipment furnished, equipment layout, conduit and wiring layout drawings, and any other details required to demonstrate that system has been coordinated and will properly function as a unit. Equipment Vendor shall check Drawings for adequacy of conductors and raceways for proposed system. Include in Bid Amount all required raceways, conductors and material necessary to suit proposed system.

B. Operation and Maintenance Manuals:

1. Operating Instruction Manuals outlining the step-by-step procedures required for system start-up and operations shall be furnished. The instructions shall include manufacturer's name, model number, service manual parts list, and brief description of all equipment and their basic operating features.
2. Maintenance Instruction Manuals outlining maintenance procedures shall be furnished. The manual shall include a troubleshooting guide listing possible breakdowns and repairs and a simplified connection wiring diagram for the system as installed.

C. Record Drawings: Final Inspection will not be made until drawings are received and approved. Record Drawings shall include "As-Built" one-line and wiring diagrams, with terminations identified, wire color coding schedule, pullbox locations, and conduit routing plans.

D. Furnish to District a printed copy of the control panel programming upon completion of final system programming.

E. Performance Test Reports: Upon completion of installed system, submit in booklet form all field tests performed to prove compliance with the specified performance criteria. Each test report shall indicate the final position of controls.

1.6 TRAINING

- A. Supplier shall demonstrate operation of systems and provide training to all end users, administrative staff, and system administrator. Coordinate times of instruction with District, at District's convenience. Supplier shall provide a minimum of 1 hour of user instructions to clerical staff and 2 hours of user/maintenance instructions to District maintenance personnel. Instruction periods shall not coincide and shall be scheduled with District, not school staff. Deliver to Owner at time of demonstration, all settings and codes programmed into system. Furnish three copies on manufacturer's standard programming worksheets. District shall provide list of authorized personnel for training sessions.

**INTRUSION ALARM SYSTEM
SECTION 28 3100
3595001000**

1.7 GUARANTEE

- A. One firm to assume full responsibility for performance on all work of this section. Guarantee all equipment against defects in material and workmanship for two (2) years, and provide on-the-premises service during normal working hours for two years, at no cost to Owner if trouble is not caused by misuse, abuse, or accident, or at current labor rates if so caused. Provide manufacturer's written one-year guarantee for equipment and parts.
- B. Service shall normally be available within 24 hours from service department of authorized distributor of manufacturer by factory trained servicemen.
- C. On-the-premises service at other than normal working hours to also be available, but labor charges for such calls to be paid by Owner at current labor rates.

PART 2 - DETAIL REQUIREMENTS AND PRODUCTS

2.1 SYSTEM OPERATION

- A. Activation of an intrusion alarm sensor shall cause a signal to be transmitted to a Central Station via telephone lines. Signal transmission shall be initiated by a built-in dialer unit. In addition to alarm reporting, system shall report trouble, low battery, and shunted zone indications.

2.2 SYSTEM DESCRIPTION

- A. Existing control panel shall be examined to provide the following features:
 - 1. The DACS control panel shall be Bosch Security Systems, Inc. model B9512G comprising a fully integrated intrusion and residential fire control system. The control panel shall support the following:
 - a. The DACS system is capable of being utilized as a combination Intrusion and Commercial Fire system per code. Fully integrated intrusion and fire functions allow users to interface with 1 system instead of 2
 - b. Optional Telephone Line Module, programmable for signaling and supervision.
 - c. Integrated Conettix IP based communication provides high-speed, secure alarm transport and control.
 - d. 32 programmable areas with perimeter and interior partitioning.
 - e. 8 on-board, hardwired points with expansion capability for a total of 599 using a combination of wired or wireless points.
 - f. Compatibility with Color Graphic Touch Screen, 2-line alpha numeric capacitive touch, ATM style LCD or 2-line LCD style Alarm Keypads.

- g. Local or remote programming, test, and diagnostic capability via a computer running the Remote Programming Software (RPS).
 - h. The system shall include an integrated USB port for local programming and diagnostics using a computer running Remote Programming Software (RPS) and a male USB2.0 to male USB 2.0 cable with no additional hardware modules required.
 - i. The system shall support the use of an Apple iOS device and/or Android device for control. Functions to include arming, disarming and control of outputs and access door, viewing of connected IP cameras. This application shall connect directly to the DACS using internet, wifi or cellular communications and shall not require a third party server or network operations center (noc).
 - j. The DACS will allow integration with up to 16 Bosch IP video cameras using the built-in Ethernet connection, allowing the cameras to act as inputs and outputs.
 - k. The DACS shall support integration with the Bosch Video Management System (BVMS) using the built-in Ethernet adapter.
 - l. The DACS shall support up to thirty-two (32) custom functions allowing the installer to combine up to 6 functions into one command. These custom functions shall be operated by keypad command, point activation, keyfob button, or programmable schedule
 - m. The DACS shall support up to 32 keypad shortcuts which allow the installer to define which commands are available at each keypad.
 - n. The DACS shall support flash firmware upgrades of systems firmware for the control panel and peripherals, allowing for future updates.
 - o. Integrated real time clock, calendar, test timer and programmable scheduling capability for relay control and automatic execution of system functions based on a time / event.
 - p. Provide 1.4 amps of power for standby operation and 2.0 amps of alarm power, both rated at 12 VDC.
 - q. 3 configurable form 'C' wet or dry-contact relay outputs with expansion capability for up to an additional 472 dry-contact relay outputs.
 - r. Integrated battery charger with reverse hook up protection, battery supervision and battery deep discharge protection.
 - s. Supervision of peripheral devices and communications interface(s).
- B. Point Functionality and Expansion:
- 1. The system shall support a programmable Monitor delay functionality for supervision of points during disarmed periods. These points may be programmed to ignore status from 1 to 60 minutes and will activate only if the point is off-normal for this time period.

INTRUSION ALARM SYSTEM
SECTION 28 3100
3595001000

2. The system shall support a programmable delay response functionality for supervision of points during armed or disarmed periods. These points may be programmed to ignore status from 1 to 60 minutes and will activate only if the point is off-normal for this time period.
3. The system shall support virtual points and outputs for customized programming of events
4. The DACS shall be capable of supporting "group zoning." Group zoning refers to the combining of points into a separately identifiable and separately annunciated (programmable text) areas.
5. The DACS shall be capable of allowing variable point response times via programming. Point response times shall be programmable over a range of 300 milliseconds to 4.5 seconds.
6. The DACS shall have the capability to expand up to 599 separately identifiable points, of which 8 are on-board and 472 are off-board wired, addressable or wireless points.
 - a. The 8 on-board points shall be able to accommodate powered class B functionality using a powered loop interface module.
 - b. Point Expansion Modules (Wired and Wireless) shall be able to be located remote to the main panel to a maximum distance of 1000 feet.
 - c. Addressable modules shall be able to be located remote to the panel to a maximum of 500 feet.

C. Areas/Accounts:

1. The DACS shall support 32 independent areas. Each of the 32 areas shall have custom text associated with the armed state, disarmed state and point-off-normal state.
2. The DACS shall be capable of assigning 1 to 4 account identifiers to the areas depending on the distribution of areas per account.
3. The DACS shall be capable of assigning 1 to 2 account identifiers to the areas depending on the distribution of areas per account.
4. All of the areas must be capable of Master (All) and/or Perimeter (Part) arming (excluding predefined Interior protection).
5. The DACS shall be capable of logically grouping 1 or more points into an area, or conversely, dividing 2 or more points into two or more areas.
6. Any area shall be configurable to allow arming by specific users when a programmable number of devices are faulted or bypassed.

7. Area(s) shall accommodate assignment of independent account numbers to define annunciation, control, and reporting functions.
 8. The DACS shall be capable of linking multiple areas to a shared area which may be automatically controlled (hallway or lobby).
- D. Output Relay Expansion: The DACS shall provide the capability for output relay expansion using relay expansion modules. Independent control of relay functions by area shall be possible through programming assignments.
1. The DACS shall be capable of activating 472 additional relay outputs for auxiliary functions based on its classifications (area vs. panel wide). Output Expansion Modules shall be able to be located remote to the main panel to a maximum distance of 1000 feet. 8 relays (Form C) are to be provided per octo-relay module
 2. The DACS shall be capable of activating 64 additional relay outputs for auxiliary functions based on its classifications (area vs. panel wide). Output Expansion Modules shall be able to be located remote to the main panel to a maximum distance of 1000 feet. 8 relays (Form C) are to be provided per octo-relay module
- E. Alarm Keypads:
1. The DACS shall accommodate connection with up to 32 ACCs, each capable of displaying custom English, Latin American Spanish, Portuguese, Canadian French, Hungarian, Greek, Italian, Polish, German, Dutch, Swedish and/or Chinese text on a liquid crystal display.
 2. The Alarm Keypads shall accommodate viewing and configuration of system parameters including:
 - a. Network Parameters
 - b. Point Parameters
 - c. Event Routing Parameters to allow programming of up to 4 report routing groups as well as configuration of primary and secondary paths.
- F. User Passcodes and Authority: Passcodes shall be programmable with authority levels to allow users to operate any or all areas.
1. Up to 2000 different passcodes shall be accommodated
 2. Up to 500 different passcodes shall be accommodated.
 3. Each passcode shall be 3 to 6 digits (variable) and be assigned a 32-character user name

INTRUSION ALARM SYSTEM
SECTION 28 3100
3595001000

- G. Access Control: THE DACS shall support access control using the B901 access control module(s).
- H. Communication: The DACS shall be capable of reporting system events and supervisory reports including alarm, trouble, missing modules, restorals, system status, AC failure, battery status to primary and secondary off-site DACR's. The following features shall be supported.
 - 1. The DACS shall be capable of communicating via dial-up analog telephone lines, over a LAN/WAN/Internet using a wired network interface module, or over a cellular network.
- I. Network Communication: The DACS shall be capable of network communications over a LAN, WAN, Intranet, or the Internet. The system shall include supervision of the network communication utilizing configurable periodic heartbeats to the Digital Alarm Communications Receiver (DACR). The DACR shall provide notification of the loss of communications from a networked system after a programmable timeframe since the last communication. The notification options shall be programmable and include local annunciation or indication to automation software.
- J. Event Log: The DACS shall maintain a log of events indicating time, day, month, year type of event, account number, area number, user ID, point text, user text and primary/secondary event route. The system shall allow the following characteristics:
 - 1. The DACS shall be capable of storing up to 10,000 events
 - 2. The DACS shall support viewing of logs locally at the ACC and remotely via an upload to a remote central station computer running the RPS software.
 - 3. The DACS shall provide notification via a report to the DACR when the event log reaches a programmable "percent full capacity". This allows retrieval of stored events via RPS to prevent any loss of event history.
- K. Testing, Diagnostic, and Programming Facilities: The DACS shall be capable of sending (manually or automatically) test and status reports to remote DACRs.
- L. Miscellaneous Features: Programmable alarm output timer, 4 programmable entry delay times, exit delay programmable by area, individually programmable point of protection text, point bypassing, key switch arming capability with LED outputs, and fire verification.
- M. False Alarm Reduction: The DACS shall comply with all ANSI SIA CP-01 2010 requirements for false alarm reduction
- N. Ambush Detection: The DACS shall include an early ambush feature that requires that the user disarm, and then inspect the facility within a specified time period, before

entering their passcode or a different authorized passcode again. If the user does not enter a passcode a second time, a duress event is generated. If the user does enter a passcode within the specified time period, the system disarms.

2.3 MANUFACTURER

- A. Acceptable Manufacturer: North America: Bosch Security Systems, Inc.; 130 Perinton Parkway; Fairport, NY 14450. ASD. Toll Free Tel: 800-289-0096. Tel: 585-223-4060. Email: request info (presales.support@us.bosch.com). Web: www.boschsecurity.us.

2.4 SYSTEM PERFORMANCE

- A. Voltage Triggers: System shall provide voltage triggers, which change state for different conditions. Used with devices such as a remote keypad sounder or keyswitch ARMED and READY LEDs.
- B. Audio Alarm Verification Option: Provides a programmable Audio Alarm Verification (AAV) option that can be used in conjunction with an output relay to permit voice dialog between an operator at the central station and a person at the premises.
- C. Cross-Zoning Capability: Helps prevent false alarms by preventing a zone from going into alarm unless its cross-zone is also faulted within 5 minutes.
- D. Exit Error False Alarm Prevention Feature: System shall be capable of differentiating between an actual alarm and an alarm caused by leaving an entry/exit door open.
- E. Built-in User's Manual and Descriptor Review: For end-user convenience, the control panel shall contain a built-in User's Manual.

2.5 COMPONENTS

- A. Equipment and accessories furnished under the terms of these specifications shall be the standard products of the manufacturers specified or required. All equipment shall be listed by U.L. All equipment and accessories shall be compatible with the system.
- B. System Integration: System shall integrate with facility doors, windows, and departments. The system shall also integrate with external systems, such as building appliances and building alert systems for remote control and central collection of external system alerts. When integrated with external systems, the system shall connect to the external system to receive status changes by way of a dry contact output from the external system. The system shall use its user interface to provide local status messages from external systems, providing for the initiation of local building policies. Optionally, the system may transmit information to an off-site monitoring service to provide initiation of remote policies when appropriate. The installer shall follow manufacturer's instructions when installing and programming system equipment.

INTRUSION ALARM SYSTEM
SECTION 28 3100
3595001000

1. Zone Input: System zone inputs allow the system to sense the change in state of an output from an external device, such as a door/window position sensor, a motion detector, a relay output from an appliance, the output of an external alert system, or other devices that provide a dry closure output.
 2. Door Contact: Bosch ISP-MCS2-FP110 surface mount sensor.
 3. Motion Detector, Wall-Mounted: Bosch ISC-BDL2-WP12G Dual-Tec Motion Detector.
 4. End of line resistors, as required.
- C. Wiring: The contractor shall provide cables consistent with the manufacturer's recommendations. The following general guidelines shall be followed for wiring installation:
1. Wiring shall be appropriately color-coded with permanent wire markers. Copper conductors shall be used.
 2. All signal cables provided under this contract shall be Class II, plenum-rated cable where required. Where subject to mechanical damage, wiring shall be enclosed in metal conduits or surface metallic raceway.
 3. Data wires shall not be enclosed in conduit or raceways containing AC power wires.
 4. Where EMI may interfere with the proper operation of the DACS circuits, twisted/shielded cable shall be used.

PART 3 - EXECUTION

3.1 INSTALLATION REQUIREMENTS

- A. Work shall be installed as shown on the Drawings in accordance with the manufacturer's diagrams and recommendations, except where otherwise indicated.
- B. Electrical Contractor shall retain the services of the duly appointed representative as specified hereinbefore, who shall furnish all equipment, make all connections to same, and place system in operation. Technician and workman employed shall be particularly skilled in this type of work.
- C. At existing sites, the existing system shall be tested as soon as possible after award of contract and prior to preparing submittals. Contractor shall test entire system to ensure proper operation. Any defects or deficiencies found shall be listed and presented to Owner in letter form. It will be assumed that existing equipment is fully functional unless identified otherwise by Contractor.
- D. Control panel shall be mounted with sufficient clearance for observation and testing.

INTRUSION ALARM SYSTEM
SECTION 28 3100
3595001000

- E. All junction boxes must be clearly marked for distinct identification.
- F. Panel enclosures shall comply with the Requirements of UL 864. Enclosures having doors over forty-eight inches (48") in height shall be provided with a three (3) point catch and lock; all other doors shall contain a cabinet type cylinder lock. Inserts shall be blind fastened so that no screws show on panel front.
- G. Detectors shall be installed in accordance with manufacturer's written instructions in areas as indicated on the Drawings.
- H. Circuits shall be terminated on screw terminals. Terminal blocks shall be Allen-Bradley Bulletin 1492 with 600 volt screw terminals for #22 to #10 conductors, mounted to type N22 channel, or approved equal. Submittal shall show internal elevation of terminal cabinets with equipment laid out.
- I. All cables shall be run through fanning strip to terminals of terminal blocks.
- J. All cables entering terminal cabinet shall be identified with T&B Vinyl, Brady Permashield mylar markers, or equal. Upon completion of installation, six (6) copies of one-line "as-built" wiring diagram shall be furnished to Architect.
- K. Each cable run on wiring diagram shall be identified with exact wire marker code (numerical or alphabetical) as appears in terminal cabinets.
- L. Detector locations shown on drawings are approximate only. Exact locations shall be coordinated with lighting and mechanical equipment and shall be placed in accordance with manufacturer's recommendations (with respect to supply air diffusers, etc.).
- M. Station locations shall be identified by school's actual room numbers and system shall be programmed accordingly. Coordinate actual room numbers with District. Coordinate final programming with District. Contractor shall furnish a printed copy of final programming to District.
- N. End-of-line resistors shall be installed at locations readily accessible, not above an elevation of 10 feet above finish floor or grade, or as shown on Drawings.
- O. No splices shall occur in underground pullboxes. System wiring shall be continuous, without splices, from terminal cabinet to terminal cabinet and control panel to devices. All interior pullboxes shall be accessible and locations shall be recorded on "As-Built" drawings.
- P. Door contacts shall be located 6" from strike side of door and both the switch and magnet shall be "glued" in place with clear silicone. Wiring shall enter door frame through jamb. Do not drill headers.
- Q. Each detector installed in this contract shall have a popit. Each door contact installed in this contract shall have a popit, unless door contacts are shown grouped on drawings. In rooms with accessible ceilings, mount popit in junction box above ceiling. Where hard ceilings occur, provide flush box high on wall or on ceiling with blank finish plate. Wiring shall go to popits, then down to detectors.

INTRUSION ALARM SYSTEM
SECTION 28 3100
3595001000

- R. Protected areas accessing remote keypads shall be wired and connected on delay zone, separate from all other protected areas.
- S. After all equipment is installed and is operational, Intrusion Alarm System subcontractor shall set angle settings, sensitivity settings, etc., of each detector to ensure optimum performance and minimal false alarms. Mask out areas of each motion type detector to remove sources of false alarms (windows, heaters, air diffusers, etc.) from detection zones.

3.2 CONSTRUCTION MEETINGS

- A. The Contractor shall schedule construction meetings at the jobsite as follows:
 - 1. Pre-rough-in meeting shall occur before installation of any boxes, raceways, etc. Exact locations of all detectors shall be established as recommended by the Intrusion Alarm System subcontractor.
 - 2. Prewire meeting shall occur after raceways are installed and prior to pulling of any wire or cable.
 - 3. Pre-termination meeting shall occur after wire and cable has been installed and prior to termination.
- B. Meetings shall be scheduled by the Contractor on a building by building basis and shall include the Project Inspector, School's Representative, the electrical subcontractor, and the Intrusion Alarm System subcontractor as a minimum.
- C. One-half to three-quarters of the way through project, District Facilities will set up a meeting (preferably at the school site) with decision makers from Facilities, Police Services, Maintenance, Maintenance Alarm Tech, General Contractor, Alarm Subcontractor, and School Administrator to review the alarm protocol and to identify responsible personnel and timelines.

3.3 TESTS

- A. After all equipment specified herein has been installed and is in operating condition, performance tests shall be conducted to determine that installation and components comply with these specifications.
 - 1. Testing shall be scheduled by the Contractor and shall be conducted at time least disruptive to school activities and as approved by District. Contractor shall provide technicians to conduct all testing (from same firm preparing submittals and performing intrusion alarm work). Testing shall be coordinated to include the Project Inspector and a representative from Engineer's office.
 - 2. At time of testing, Contractor shall ensure that his submittal will reflect all materials and work necessary to make new equipment function properly with existing.
 - 3. Contractor shall furnish all instruments and personnel required for tests.
 - 4. Conduct tests for following:

- a. Verify that the system is free of grounds or open circuits. The central control board shall indicate when a ground or open circuit exists.
 - b. Verify that devices are functioning as specified.
- B. Testing shall be reconducted to verify correction of any defect found in initial testing.
- C. After system is completely tested, the Contractor shall take the following actions with the Owner:
 - 1. The Contractor will schedule a meeting with the Alarm Sub-contractors and Owner's Representatives to determine alarm zone and device nomenclature. The Contractor shall ensure that the alarm zone and device nomenclature matches the actual building and door or room numbers used by the school. Architectural numbering shall not be used. Once confirmed, the Contractor shall demonstrate this to Owner's Representatives.

- END OF SECTION -

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Engineered fill materials.
 - 2. Imported engineered fill material.
 - 3. Landscape backfill material'
 - 4. Decomposed granite.
 - 5. Aggregate base.

1.2 RELATED REQUIREMENTS

- A. Section 01 5000, Temporary Facilities and Controls.
- B. Section 01 5713, Erosion Control.
- C. Section 01 8113, Sustainable Design Requirements, for CAL-Green **[and Collaborative for High Performance Schools (CHPS)]** general requirements and procedures.
- D. Section 31 2333, Trenching and Backfilling.
- E. Section 32 1200, Asphalt Concrete Paving.
- F. Section 32 1600, Site Concrete.
- G. Section 33 0000, Utilities
- H. Section 33 4000, Storm Drainage Utilities.

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CAL Green), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- C. Local Jurisdiction: Any work within the street, highway or right-of-way shall be performed in accordance with the requirement of the governmental agencies having jurisdiction, and shall not begin until all of those governing authorities have been notified.
- D. ASTM International (ASTM):
 - 1. D698-00 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures, Using 5.5 lb (2.49 Kg) Rammer and 12 inch (304.8 mm) Drop.
 - 2. D1556-00 - Test Method for Density of Soil in Place by the Sand-Cone Method.

**EARTHWORK
SECTION 31 0000
3595001000**

3. D1557-02e2 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 10 lb. (4.54 Kg) Rammer and 18 inch (457 mm) Drop.
4. D3017-05 Test Methods for Moisture Content of Soils and Soil-Aggregate Mixture by Nuclear Methods (Shallow Depth).
5. D422-63(2007) e1 Test Method for Particle Size Analysis of Soil.
6. D4318-05 Test Method for Liquid Limit, Plastic Limit, and Plasticity Limit.

E. CALTRANS Standard Specifications Section 17.

F. CAL-OSHA, Title 8, Section 1590 (e).

1.4 ADMINISTRATION REQUIREMENTS

A. Submittal Procedures:

1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
3. Sustainable Design Submittals shall comply with the additional requirements of Section 01 8113, Sustainable Design Requirements.

B. Site Visitation: All bidders interfacing with existing conditions shall visit the site prior to bid to verify general conditions of improvements. Discrepancies must be reported prior to the bid for clarification.

1.5 ACTION SUBMITTALS

A. Provide supplier's descriptive literature for all products to demonstrate compliance with specified attributes.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Contractor / Installer.

1.7 CLOSEOUT SUBMITTALS

A. Guarantee: Submit subcontractor's guarantee.

1.8 QUALITY ASSURANCE

A. Contractor / Installer shall have been in business for five (5) years providing/finishing similar size projects and complexity.

B. Contractor shall be solely responsible for all subgrades built. Failures resulting from inadequate compaction or moisture content are the responsibility of the contractor. Contractor shall be solely responsible for any and all repairs.

C. The representatives of the Owner's testing lab will not act as supervisor of construction, nor will they direct construction operations. Neither the presence of the Owner's testing

lab representatives nor the testing by the Owner's testing lab shall excuse the contractors or subcontractors for defects discovered in their work during or following completion of the project. Correcting of inadequate compaction or moisture content is the sole responsibility of the contractor.

- D. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.
- E. All materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.
- F. Tests (See Part 3, Article "Testing and Observation" for Compaction Testing).

1.9 DELIVERY, STORAGE AND HANDLING

- A. Transport, store and handle in strict accord with the local jurisdiction.

1.10 FIELD CONDITIONS

1.11 EXISTING SITE CONDITIONS

- A. Contractor shall acquaint himself with all site conditions. If unknown active utilities are encountered during work, notify Architect promptly for instructions. Failure to notify will make Contractor liable for damage to these utilities arising from Contractor's operations subsequent to discovery of such unknown active utilities.
- B. Existing civil, mechanical and electrical improvements are shown on respective site plans to the extent known. Should the Contractor encounter any deviation between actual conditions and those shown, he is to immediately notify the Architect before continuing work.

1.12 ON SITE UTILITY VERIFICATION AND REPAIR PROCEDURES

- A. Ground-breaking requirements:
 - 1. All underground work performed by a Contractor must be authorized by the District's Construction Manager or the Low Voltage Consultant prior to start of construction.
 - 2. The Contractor is to obtain and keep the original School's construction utility site plans on site during all excavation operations. Contractor can contact the District's Construction Manager, Facilities Manager, or the Low Voltage Consultant to procure the drawings.
- B. Underground Utility Locating:
 - 1. The contractor shall hire an Underground Utility Locating Service to locate existing underground utility pathways in areas effected by the scope of work for excavation.
 - 2. Contractor must use an underground utility locator service with a minimum of 3 years experience. The equipment operator must have demonstrated experience.

EARTHWORK
SECTION 31 0000
3595001000

Contact Norcal Underground Locating (800/986-6722) or Precision Locating (800/577-7324)

3. The Underground Utility Locator Service must have the use of equipment with the ability to locate by means of inductive clamping, induction, inductive metal detection, conductive coupling, or TransOnde (Radiodetection) to generate signals, passive locating (free scoping) for "hot" electric, and metal detector.
4. The Underground Utility Locator Service must be able to locate existing utilities at a depth of at least 72".
5. The Underground Utility Locator Service must be able to locate but are not limited to locating the following types of utility pathways:
 - a. All conduit pathways containing 110 volt or greater 50-60Hz electrical wire.
 - b. All conduit pathways containing an active cable TV system.
 - c. All conduit pathways containing wire or conductor in which a signal can be attached and generated without damaging or triggering the existing systems.
 - d. All empty conduit pathways or pipe in which a signal probe or sonde (miniature transmitter) can be inserted.
 - e. All conduit pathways containing non-conductive cables or wires in which a signal probe or sonde (miniature transmitter) can be inserted.
 - f. All plastic and other nonconductive water lines in which a TransOnde Radiodetection) or other "transmitter" can be applied to create a low frequency pressure wave (signal) without damaging or triggering the existing systems.
 - g. All copper or steel waterlines and plastic or steel gas lines.
6. All markings made by the Underground Utility Locator Service or other shall be clear and visible.
7. The contractor shall maintain all markings made by Underground Utility Locator Service or other throughout the entire length of the project.
8. The Underground Utility Locator Service shall provide the contractor with two sets of maps showing the location of utilities and average depth. They will be referenced to permanent buildings. Contractor will deliver one copy to the district at no additional charge.
9. Contractor is responsible to contact Underground Service Alert (U.S.A. 800/227-2600) and receive clearance prior to any excavation operations.
10. Contractor shall inform the (District's Construction Manager)(Architect)(Owner) no later than five (5) days prior to the date scheduled for the utility locator service to be on site.

1.13 PROTECTION

- A. Adequate protection measures shall be provided to protect workmen and passers-by on and off the site. Adjacent property shall be fully protected throughout the operations. Blasting will not be permitted. Prevent damage to adjoining improvements and properties both above and below grade. Restore such improvements to original condition should damage occur. Replace trees and shrubs outside building area disturbed by operations.

**EARTHWORK
SECTION 31 0000
3595001000**

- B. In accordance with generally accepted construction practices, the Contractor shall be solely and completely responsible for working conditions at the job site, including safety of all persons and property during performance of the work. This requirement shall apply continuously and shall not be limited to normal working hours.
- C. Any construction review of the Contractor's performance conducted by the Geotechnical Engineer is not intended to include review of the adequacy of the Contractor's safety measures, in, on, or near the construction site.
- D. Provide shoring, sheeting, sheet piles and or bracing to prevent caving, erosion or gullyng of sides of excavation.
- E. Surface Drainage: Provide for surface drainage during period of construction in manner to avoid creating nuisance to adjacent areas. The contractor shall make a reasonable effort on a daily basis to keep all excavations and the site free from water during entire progress of work, regardless of cause, source, or nature of water.
- F. Adjacent streets and sidewalks shall be kept free of mud, dirt or similar nuisances resulting from earthwork operations.
- G. The site and adjacent influenced areas shall be watered as required to suppress dust nuisance. Dust control measures shall be in accordance with the local jurisdiction.
- H. Trees: Carefully protect existing trees that are to remain. Provide temporary irrigation as necessary to maintain health of trees.

1.14 SEASONAL LIMITS

- A. No fill material shall be placed, spread or rolled during unfavorable weather conditions. When work is interrupted by rains, fill operations shall not be resumed until field tests indicate that moisture content and density of fill are satisfactory.
- B. Excessively wet fill material shall be bladed and aerated per Article "Subgrade Preparation".

1.15 TESTING

- A. General: Refer to Section 01 4523 - TESTING AND INSPECTION SERVICES, AND STRUCTURAL TESTS AND INSPECTIONS LIST, DSA-103.
- B. Geotechnical Engineer: Owner is retaining a Geotechnical Engineer to determine compliance of fill with Specifications, and to direct adjustments in fill operations. Costs of Geotechnical Engineer will be borne by Owner; except those costs incurred for re-tests or re-inspection will be paid by Owner and backcharged to Contractor.
 - 1. If Contractor elects to process or mine onsite materials for use as Suitable Fill, Aggregate Sub Base, Aggregate Base, Rock, Crushed Rock or sand the cost of all testing of this material shall be paid for by the Contractor.
 - 2. Testing of import fill for compliance with Department of Toxic Substance Control (DTSC) shall be paid for by the Contractor.

**EARTHWORK
SECTION 31 0000
3595001000**

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Engineered Fill Materials: All fill shall be of approved local materials supplemented by imported fill if necessary. "Approved" local materials are defined as local soils tested and approved by Geotechnical Engineer free from debris, and concentrations of clay and organics; and contain rocks no larger than 3-inches in greatest dimension. The soil and rock should be thoroughly blended so that all rock is surrounded by soil. This may require mixing of the soil and rock with a dozer prior to placement and compaction. Clods, rocks, hard lumps or cobbles exceeding 3-inches in final size shall not be allowed in the upper 6 inches of any fill. Native clay or clayey soils will not be permitted within the upper 12 inches of building pad areas or paved areas.
- B. Imported Engineered Fill Material: Imported fill may be required to complete work. Proposed import fill material shall meet the above requirements; shall be similar to the native soils. Import fill shall meet the above requirements; shall have plasticity index of 20 or less; an Expansion Index of 15 or less; be free of particles greater than 3-inch (3") in largest dimension; be free of contaminants and have corrosion characteristics within the acceptable limits. All import fill material shall be tested and approved by Soils Engineer prior to transportation to the site. Proposed fill material shall comply with DTSC guidelines to include Phase 1 environmental site assessment and related tests. Refer to the October 2001 DTSC Information Advisory for clean imported fill material.
1. DTSC TESTING: Site work contractor is to coordinate testing with an analytical lab, hired by the owner, licensed by the State of California for the DTSC testing. The costs associated with testing will be paid by the contractor.
 2. DTSC testing shall include documentation as to the previous land use, location, and history. Soils shall be analyzed for all compounds of concern to ensure the imported soil is uncontaminated and acceptable. Testing shall be performed per the recommendations included in DTSC Imported Fill Advisory [http://www.dtsc.ca.gov/Schools/upload/SMP FS Cleanfill-Schools.pdf](http://www.dtsc.ca.gov/Schools/upload/SMP_FS_Cleanfill-Schools.pdf)). Soils shall be tested prior to import to the project site.
 3. Lab shall determine geographically which tests and analysis comparison will be appropriate for the testing. (CAM 17 / Title 22); (RWQCB) Regional Water Quality Control Board; or (OEHHA) Office of Environmental Health Hazard Assessment.
 4. Frequency of testing shall be conducted in accordance with DTSC's Imported Fill Advisory as follows;

Fill Material Sample Schedule	
Area Of Individual Borrow Area	Sampling Requirements
2 Acres or less	Minimum of 4 samples
2 to 4 Acres	Minimum of 1 sample every ½ acre
4 to 10 Acres	Minimum of 8 samples

**EARTHWORK
SECTION 31 0000
3595001000**

Greater than 10 Acres	Minimum of 8 locations with 4 subsamples per location
-----------------------	---

Volume of Borrow Area Stockpile	
Up to 1,000 Cubic Yards	1 sample per 250 cubic yards
1,000 to 5,000 Cubic Yards	4 samples for the first 1000 cubic yards + 1 sample per each additional 500 cubic yards
Greater than 5,000 Cubic Yards	12 samples for the first 5,000 cubic yards + 1 sample per each additional 1,000 cubic yards

5. Reports/ Documentation
 - a. Results of the testing analysis shall be sent to the Owner; Architect; Project Inspector, Project Civil Engineer, DTSC, and DSA. Letter shall reference DSA file and application numbers.
- C. Landscape Backfill Material:
 1. The top 3" of native topsoil stripped from the site may be used for landscape backfill material.
- D. Water: Furnish all required water for construction purposes, including compaction and dust control. Water shall be potable.
- E. Aggregate Base: Provide Class 2 3/4" Aggregate Base conforming to standard gradation as specified in Cal Trans Standard Specifications, Section 26,-1.02A.
- F. Decomposed Granite: Decomposed Granite shall be well graded mixture of fine to 1/8" particles in size with no clods. The material shall be free of vegetation, other soils, debris and rock. The material shall be redish-tan to tan in color.
- G. Decomposed Granite Solidifier: PolyPavement or equal.

PART 3 - EXECUTION

3.1 INSPECTION LAYOUT AND PREPARATION

- A. Prior to installation of the work of this Section, carefully inspect and verify by field measurements that installed work of all other trades is complete to the point were this installation may properly commence
- B. Layout all work, establish grades, locate existing underground utilities, set markers and stakes, setup and maintain barricades and protection facilities; all prior to beginning

**EARTHWORK
SECTION 31 0000
3595001000**

actual earthwork operations. Layout and staking shall be done by a licensed Land Surveyor or Professional Civil Engineer.

- C. Verify that specified items may be installed in accordance with the approved design.
- D. In event of discrepancy, immediately notify Owner and the Architect. Do not proceed in discrepant areas until discrepancies have been fully resolved.

3.2 PERFORMANCE

A. GENERAL:

- 1. General: Do all grading, excavating and cutting necessary to conform finish grade and contours as shown. All cuts shall be made to true surface of subgrade.
- 2. Archaeological Artifacts: Should any artifacts of possible historic interest be encountered during earthwork operations, halt all work in area of discovery and immediately contact the Architect for notification of appropriate authorities.
- 3. Degree of Compaction: Percentage of maximum density, hereinafter specified as degree of compaction required, means density equivalent to that percentage of maximum dry density determined by ASTM D1557 Compaction Test method, and such expressed percentage thereof will be minimum acceptable compaction for specified work.
- 4. Moisture Content: Moisture content shall be as noted below and as called for on the plans. Moisture content shall be maintained until subgrade is covered by surfacing materials.

3.3 DEMOLITION, DISPOSAL AND DISPOSITION OF UNDESIRABLE MAN-MADE FEATURES

- A. All other obstructions, such as abandoned utility lines, septic tanks, concrete foundations, and the like shall be removed from site. Excavations resulting from these removal activities shall be cleaned of all loose materials, dish shaped, and widened as necessary to permit access for compaction equipment. Areas exposed by any required over-excavation should be scarified to a depth of 12", moisture-conditioned to near optimum moisture content, and recompacted to at least 95% of the maximum dry density.

3.4 TESTING AND OBSERVATION

- A. All grading and earthwork operations shall be observed by the Geotechnical Engineer or his representative, serving as the representative of the Owner.
- B. Field compaction tests shall be made by the Geotechnical Engineer or his representative. If moisture content and/or compaction are not satisfactory, Contractor will be required to change equipment or procedure or both, as required to obtain specified moisture or compaction. Notify Geotechnical Engineer at least 48 hours in advance of any filling operation.
- C. Earthwork shall not be performed without the notification or approval of the Geotechnical Engineer or his representative. The Contractor shall notify the Geotechnical Engineer at least two (2) working days prior to commencement of any aspect of the site earthwork.

- D. If the Contractor should fail to meet the compaction or design requirements embodied in this document and on the applicable plans, he shall make the necessary readjustments until all work is deemed satisfactory, as determined by the Geotechnical Engineer or Architect/Engineer.
- E. After each rain event Geotechnical Engineer shall test fill material for optimum moisture. Do not place any fill material until desired moisture is achieved.

3.5 CLEARING AND GRUBBING

- A. Prior to grading, remove all debris off-site. Remove trees and brush including the root systems. Holes resulting from tree and brush removal should be prepared and backfilled in accordance with paragraphs 3.7, 3.8, 3.9, and 3.10. This may require deepening and/or widening the holes to adequately remove disturbed soil and provide room for compaction equipment. Strip the surface of all organics. Strippings meeting the requirements of Section 32 9000 may be used in landscape areas only.

3.6 CUTTING

- A. Building pads that are located within a cut/fill transition area will have to be overexcavated to provide a semi-uniform fill beneath the building pad. The portions of building pads located in cut areas shall be overexcavated to provide no more than 1 foot difference in fill placed in the same building pad.
- B. Do all cutting necessary to bring finish grade to elevations shown on Drawings.
- C. When excavation through roots is necessary, cut roots by hand.
- D. Carefully excavate around existing utilities to avoid unnecessary damage. The contractor shall anticipate and perform hand work near existing utilities as shown on the survey, without additional claims or cost.

3.7 STRUCTURAL EXCAVATION

- A. General: Excavate to bear on firm material at contract depth shown on Structural Drawings.
- B. Footings: All footing excavations shall be of sufficient width for installation of formwork, unless earth will retain its position during concreting. All portions of footings above grade must be formed. In the event that footings are placed against earth, footing widths below grade shall be increased 2 inches from those shown on Drawings and positive protection shall be provided for top corners of trench.
- C. Unsuitable Ground: Any errors in structural excavation, soft ground, or clay soils found when excavating shall be reported to Architect. In no case shall work be built on any such soft or clayey unsuitable surface without direction from the Architect. Restore excavations to proper elevation with engineered fill material compacted to 95% of dry density.

**EARTHWORK
SECTION 31 0000
3595001000**

3.8 SUBGRADE PREPARATION

- A. Grade compact and finish all subgrades within a tolerance of 0.10' of grades as indicated on Drawings and so as not to pool water. Subgrade within building pads and concrete walks shall be within 0.05' of grades indicated.
- B. After clearing, grubbing and cutting, subsurface shall be plowed or scarified to a depth of at least 12", until surface is free from ruts, hummocks or other uneven features. Moisture condition to 2% above optimum moisture content and recompact to at least 95% of the maximum dry density as determined by ASTM Test Method D1557. If the existing soils are at a water content higher than specified, the contractor shall provide multiple daily aerations by ripping, blading, and/or discing to dry the soils to a moisture content where the specified degree of compaction can be achieved. After seven consecutive working days of daily aerations, and the moisture content of the soil remains higher than specified, the contractor shall notify the architect. If the existing soils have a moisture content lower than specified, the contractor shall scarify, rip, water and blade existing soil to achieve specified moisture content. The contractor shall make proper allowance in schedule and methods to complete this work.
- C. After subgrade for fill within building pad area or within paved areas has been cleared, plowed and scarified, it shall be disked or bladed until uniform and free from large clods, brought to 2% above optimum moisture content and compacted to not less than 95% of maximum dry density, as determined by ASTM Test Method D1557, and such expressed percentage thereof will be minimum acceptable density for specified work.
- D. Subgrade in areas to receive landscaping shall be compacted to (85%).
- E. Where Contractor over-excavates building pads through error, resulting excavation shall be recompacted as engineered fill at Contractor's expense.

3.9 PLACING, SPREADING AND COMPACTING FILL MATERIAL IN BUILDING PAD AND PAVEMENT AREAS

- A. Selected fill material shall be placed in layers which, when compacted, shall not exceed 6 inches in compacted thickness. Each layer shall be spread evenly and thoroughly mixed to insure uniformity in moisture content.
- B. Selected fill material shall be moisture-conditioned to specified moisture content. Selected fill material shall be unfrozen. When moisture content of fill material is below that specified, add water until proper moisture content is achieved. When moisture content is above that specified, aerate by blading or other methods mentioned in 3.08 B until moisture content is satisfactory.
- C. After each layer has been placed, mixed and spread evenly, it shall be thoroughly compacted to a minimum of 90% as determined by the ASTM D1557 Compaction Test. Compact each layer over its entire area until desired density has been obtained.
- D. Recomposition of Fill in Trenches and Compaction of Fill Adjacent to Walls: Where trenches must be excavated, backfill with material excavated. Place in lifts that when compacted do not exceed 6", moisture conditioned to (optimum)(2% above optimum)

moisture content, and compact to a minimum of 90% relative compaction in building pad and paved areas, and to 90% relative compaction in landscape areas.

- E. Jetting of fill materials will not be allowed.

3.10 FINAL SUBGRADE COMPACTION

- A. Building Pads: Upper 12" of all final building pad subgrades (including future buildings) shall be uniformly compacted at specified moisture content to at least 90% of maximum dry density, as determined by ASTM D1557 Compaction Test, regardless of whether final subgrade elevation is attained by filling, excavation, or is left at existing grade. After acceptance of final compaction test, contractor shall maintain the required moisture content of subgrade until concrete flatwork is placed.
- B. Paved Areas: Upper 12" of all final subgrades supporting pavement sections and all other flatwork shall be brought to specified moisture content and shall be uniformly compacted to not less than 95% of maximum dry density, regardless of whether final subgrade elevation is attained by filling, excavation, or is left at existing grade. After acceptance of final compaction test, contractor shall maintain the required moisture content of subgrade until concrete flatwork is placed.
- C. Other Fill and Backfill: Upper 12" of all other final subgrades or finish grades shall be compacted to 90% of maximum dry density.
- D. Gravel Fill: Do not place compacted gravel fill until after underground work and foundations are in place. Compact gravel fill with vibratory plate or similar equipment to preclude settlement.

3.11 PLACING, SPREADING, AND COMPACTION OF LANDSCAPE BACKFILL MATERIALS

- A. All landscaped areas shall receive topsoil. After subgrade under landscape area has been scarified and brought to 85% maximum dry density, top soil shall be placed evenly to depth of 12" at 85% of maximum dry density.
- B. Project Inspector must verify that materials are uniformly spread to minimum depth specified.

3.12 SLOPE CONSTRUCTION

- A. Cut slopes shall be constructed to no steeper than 2:1(horizontal:vertical). Fill slopes shall be constructed to no steeper than 2:1 (horizontal:vertical). Prior to placement of fill on an existing slope the existing slope shall be benched. The benches shall be in a ratio of 2 horizontal to 1 vertical. The face of the fill slopes shall be compacted as the fill is placed, or the slope may be overbuilt and then cut back to the design grade. Compaction by track walking will not be allowed.

3.13 FINISH GRADING

- A. At completion of project, site shall be finished graded, as indicated on Drawings. Finish grades shall be "flat graded" to grades shown on the drawing. Mounding of finish grades

EARTHWORK
SECTION 31 0000
3595001000

will not be allowed unless otherwise directed on the landscape drawings. Tolerances for finish grades in drainage swales shall be $\pm 0.05'$. Tie in new and existing finish grades. Leave all landscaped areas in finish condition for lawn seeding. Landscaped planters shall be graded uniformly from edge of planter to inlets. If sod is used for turf areas the finish grade on which it is placed shall be lowered to allow for sod thickness.

- B. All landscape areas shall be left free of rock or foreign material.
- C. All landscape areas shall be approved by Architect prior to any planting.

3.14 SURPLUS MATERIAL

- A. Excavated material not required for grading or backfill shall be removed from site at contractor's expense.

3.15 CLEANING

- A. Refer to Section 01 7700.
- B. Remove from fill all vegetation, wood, form lumber, casual lumber, and shavings, in contact with ground; buried wood will not be permitted in any fill.

END OF SECTION

s:\master specifications\division 31 - earthwork\31 0000_earthwork.docx
Received from WCEI: June 7, 2018, Updated format: 9-3-21

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Trench backfill materials.

1.2 RELATED REQUIREMENTS

- A. Section 01 5000, Temporary Facilities and Controls.
- B. Section 01 8113, Sustainable Design Requirements, for CAL-Green **[and Collaborative for High Performance Schools (CHPS)]** general requirements and procedures.
- C. Section 31 0000, Earthwork.
- D. Section 32 8000, Irrigation.
- E. Section 33 0000, Utilities
- F. Section 33 4000, Storm Drainage Utilities.

1.3 REREENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CAL Green), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- C. California Plumbing Code (CPC), edition as noted on the drawings.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Submittal Procedures:
 - 1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
 - 2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
 - 3. Sustainable Design Submittals shall comply with the additional requirements of Section 01 8113, Sustainable Design Requirements.
- B. Coordination:
 - 1. General Contractor shall coordinate work as herein specified, in accordance with drawings and as required to complete scope of work with all related trades.

TRENCHING AND BACKFILLING
SECTION 31 2333
3595001000

1.5 ACTION SUBMITTALS

- A. Provide supplier's descriptive literature for all products to demonstrate compliance with specified attributes:

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For contractor / Installer.

1.7 CLOSEOUT SUBMITTALS

- A. Guarantee: Submit subcontractor's guarantee.

1.8 QUALITY ASSURANCE

- A. Contractor / Installer shall have been in business for five (5) years providing/finishing similar size projects and complexity.
- B. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.
- C. All materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.

1.9 DELIVERY, STORAGE AND HANDLING

- A. Transport, store and handle in strict accord with the local jurisdiction.

1.10 FIELD CONDITIONS

- A. Contractor shall acquaint himself with all existing site conditions. If unknown active utilities are encountered during work, notify Architect promptly for instructions. Failure to notify will make Contractor liable for damage to these utilities arising from Contractor's operations subsequent to discovery of such unknown active utilities.
- B. Trench dewatering may be necessary. Contractor shall provide any and all tools, equipment and labor necessary for trench dewatering no matter what the source. Dewatering shall be continuous until all site utilities are installed and backfilled.

1.11 PROTECTION

- A. Adequate protection measures shall be provided to protect workers and passers-by on and off the site. Adjacent property shall be fully protected throughout the operations. Blasting will not be permitted. Prevent damage to adjoining improvements and properties both above and below grade. Restore such improvements to original condition should damage occur. Replace trees and shrubs outside building area disturbed by operations. Repair all trenches in grass areas with new sod (seeding not permitted) and "stake-off" for protection.

TRENCHING AND BACKFILLING
SECTION 31 2333
3595001000

- B. Contractor shall be solely and completely responsible for working conditions at the job site, including safety of all persons and property during performance of the work. This requirement shall apply continuously and shall not be limited to normal working hours.
- C. Any construction review of the Contractor's performance conducted by the Architect or Owner is not intended to include review of the adequacy of the Contractor's safety measures, in, on or near the construction site.
- D. Provide shoring, sheeting, sheet piles and or bracing to prevent caving, erosion or gulying of sides of excavation.
- E. Surface Drainage: Provide for surface drainage during period of construction in manner to avoid creating nuisance to adjacent areas. Keep all excavations free from water during entire progress of work, regardless of cause, source or nature of water.
- F. Adjacent streets and sidewalks shall be kept free of mud, dirt or similar nuisances resulting from earthwork operations.
- G. The site and adjacent influenced areas shall be watered as required to suppress dust nuisance.
- H. Trees: Carefully protect existing trees which are to remain.

1.12 TRENCH SAFETY PROVISIONS

- A. General Contractor shall be solely responsible for safety design, construction and coordination with agencies having jurisdiction. If such plan varies from shoring system standards established by Construction Safety Orders, plan shall be prepared by registered civil or structural engineer.
- B. Nothing herein shall be deemed to allow use of shoring, sloping or protective system less effective than that required by Construction Safety Orders of California State Division of Industrial Safety.
- C. When trenching through paved surface, provide steel trench plates to cover open trenches daily until trenches are backfilled.

1.13 SEASONAL LIMITS

- A. No backfill material shall be placed, spread or rolled during unfavorable weather conditions. When work is interrupted by heavy rains, full operations shall not be resumed until field tests indicate that moisture content and density of fill are satisfactory.
- B. Material above optimum moisture shall be processed per Section 31 0000, Part 3, Article "Subgrade Preparation".

1.14 TESTING

- A. General: Refer to Section 31 0000, Part 1, Article "Testing" and Part 3, Article "Testing and Observation".

TRENCHING AND BACKFILLING
SECTION 31 2333
3595001000

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Backfill materials: Pipeline and conduit trench backfill as shown on the plans and as specified below.
 - 1. ¾ inch crush rock.
 - 2. Native Materials: Soil native to Project Site, free of wood, organics, and other deleterious substances. Rocks shall not be greater than 3-inches.
 - 3. Sand: Fine granular material, free of organic matter, mica, loam or clay.
 - 4. Lean Mix Concrete: 3 sacks of cement per yard plus sand.
 - 5. Class 2 aggregate base, ¾" rock, per Caltrans Section 26-1.02B
 - 6. Controlled Density Fill: 3 sack slurry backfill.
- B. Water: Furnish all required water for construction purposes, including compaction and dust control. Water shall be potable.
- C. Provide other bedding and backfill materials as described and specified in Section 33 0000, Section 33 4000 and Divisions 22 and 26.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verification of Conditions:
 - 1. Examine areas and conditions under which work is to be performed.
 - 2. Identify conditions detrimental to proper or timely completion of work and coordinate with General Contractor to rectify.

3.2 INSTALLATION

- A. Perform work in accordance with pipe manufacturer's recommendations, as herein specified and in accordance with drawings.

3.3 TRENCHING

- A. Make all trenches open vertical construction with sufficient width to provide free working space at both sides of trench around installed item as required for caulking, joining, backfilling and compacting; not less than 12 inches wider than pipe or conduit diameter, unless otherwise noted.
- B. Carefully excavate around existing utilities to avoid unnecessary damage. The contractor shall anticipate and perform hand work near existing utilities as shown on the survey, without additional claims or cost.
- C. Trench straight and true to line and grade with bottom smooth and free of edges or rock points.

TRENCHING AND BACKFILLING
SECTION 31 2333
3595001000

- D. Where depths are not shown on the plans, trench to sufficient depth to give minimum fill above top of installed item measured from finish grade above the utility as follows:
1. Sewer pipe: depth to vary
 2. Storm drain pipe: depth to vary
 3. Water pipe - Fire Supply: 36 inches
 4. Water pipe – Domestic Supply: 30 inches

3.4 BACKFILL

- A. Pipe Trench Backfill is divided into three zones:
1. Bedding: Layer of material directly under the pipe upon which the pipe is laid.
 2. Pipe Zone: Backfill from the top of the bedding to 6 inches (compacted) over the top of the pipe.
 3. Upper Zone: Backfill between top of Pipe Zone and to surface of subgrade.
- B. Bedding: Type of material and degree of compaction for bedding backfill shall be as defined in the Details and Specifications.
- C. Pipe Zone and Upper Zone Backfill:
1. Type of material and degree of compaction Pipe Zone and Upper Zone Backfill shall be as required by Drawings, Details, & Specifications.
 2. Upper Zone Backfill shall not be placed until conformance of Bedding and Pipe Zone Backfill with specified compaction test requirements has been confirmed.
 3. Backfill shall be brought up at substantially the same rate on both sides of the pipe and care shall be taken so that the pipe is not floated or displaced. Material shall not be dropped directly on pipe.
- D. Backfill Compaction:
1. Backfill shall be placed in layers which, when compacted shall not exceed 6 inches in thickness. Each layer shall be spread evenly and thoroughly mixed to insure uniformity. Do not backfill over, wet, frozen or soft subgrade surfaces. Employ a placement method that does not disturb or damage foundation walls, perimeter drainage, foundation damp-proofing, waterproofing or protective cover.
 2. When moisture content of fill material is below that required to achieve specified density, add water until proper moisture content is achieved. When moisture content is above that required, aerate by blading or other methods until specified moisture content is met; see Section 31 0000, Part 3, Article "Subgrade Preparation".
 3. After each layer has been placed, mixed and spread evenly, it shall be thoroughly compacted to 95% of maximum dry density while at specified moisture content. Compact each layer over its entire area until desired density has been obtained.
 4. Compaction: All backfill operations shall be observed by the Inspector of Record and/or Geotechnical Engineer. Field density tests shall be made to check compaction of fill material. If densities are not satisfactory, Contractor will be

TRENCHING AND BACKFILLING
SECTION 31 2333
3595001000

required to change equipment or procedure or both, as required to obtain specified densities. Notify Inspector and Architect at least 24 hours in advance of any operation.

E. Backfill in Areas Previously Lime or Cement Treated

1. Where trenching occurs in areas that have been lime or cement treated, class 2 aggregate bases or approved controlled density backfill material shall be used for the top 12-inches minimum of the trench or thickness shall match the depth of treated material.

3.5 TRENCH AND SITE RESTORATION

- A. Finished surface of trenches shall be restored to a condition equal to, or better than the condition as existed prior to excavation work.

3.6 PROTECTION

- A. Protect existing surfaces, structures, and utilities from damage. Protect work by others from damage. In the event of damage, immediately repair or replace to satisfaction of Owner.
- B. Repair existing landscaped areas to as new condition. Replant trees, shrubs or groundcover with existing materials if not damaged or with new materials if required. Replace damaged lawn areas with sod, no seeding will be permitted.
- C. Replace damaged pavement with new compatible matching materials. Concrete walks to be removed to nearest expansion joint and entire panel replaced. Asphalt to be cut neatly and replaced with new materials.
- D. Any existing materials removed or damaged due to trenching to be returned to new condition.

3.7 SURPLUS MATERIAL

- A. Remove excess excavated material, unused materials, damaged or unsuitable materials from site.

3.8 CLEANING

- A. Refer to Section 01 7700.
- B. Contractor will keep the work areas in a clean and safe condition so his rubbish, waste, and debris do not interfere with the work of others throughout the project and at the completion of work.
- C. After completion of work in this section, remove all equipment, materials, and debris. Leave entire area in a neat, clean, acceptable condition.

TRENCHING AND BACKFILLING
SECTION 31 2333
3595001000

END OF SECTION

s:\master specifications\division 31 - earthwork\31 2333_trenching and backfilling.docx
Received from WCEI: October 20, 2012; Updated 9-2-21

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Aggregate.
 - 2. Asphalt paving.
 - 3. Seal coat.
 - 4. Wood headers and stakes.
 - 5. Pavement marking.
 - 6. Precast concrete bumpers.

1.2 RELATED REQUIREMENTS

- A. Section 01 5000, Temporary Facilities and Controls.
- B. Section 01 6116, Volatile Organic Compound (VOC) Restrictions, for VOC limits pertaining to adhesives, sealants, fillers, primers, and coatings.
- C. Section 01 8113, Sustainable Design Requirements, for CAL-Green **[and Collaborative for High Performance Schools (CHPS)]** general requirements and procedures.
- D. Section 31 0000, Earthwork.
- E. Section 31 2333, Trenching and Backfilling.
- F. Section 32 8000, Irrigation.
- G. Section 33 0000, Utilities.
- H. Section 33 4000, Storm Drainage Utilities.

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CAL Green), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- C. Local Jurisdiction: Any work within the street, highway or right-of-way shall be performed in accordance with the requirement of the governmental agencies having jurisdiction, and shall not begin until all of those governing authorities have been notified.
- D. ASTM International (ASTM):

**ASPHALT CONCRETE PAVING
SECTION 32 1200
3595001000**

1. D698-00 Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures, Using 5.5 lb (2.49 Kg) Rammer and 12 inch (304.8 mm) Drop.
2. D1556-00 Test Method for Density of Soil in Place by the Sand-Cone Method.
3. D1557-02 Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 10 lb. (4.54 Kg) Rammer and 18 inch (457 mm) Drop.
4. D6628-16 Standard Specification for Color of Pavement Marking Materials.
5. D3017-05 Test Methods for Moisture Content of Soils and Soil-Aggregate Mixture by Nuclear Methods (Shallow Depth).
6. D4318-05 Test Method for Liquid Limit, Plastic Limit, and Plasticity Limit.

E. CALTRANS Standard Specifications.

F. CAL-OSHA, Title 8, Section 1590 (e).

1.4 ADMINISTRATION REQUIREMENTS

A. Submittal Procedures:

1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
3. Sustainable Design Submittals shall comply with the additional requirements of Section 01 8113, Sustainable Design Requirements.

1.5 ACTION SUBMITTAS

A. Provide supplier's descriptive literature for all products to demonstrate compliance with specified attributes.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Contractor / Installer.

B. Sustainable Design:

1. General
 - a. Submit information necessary to establish and document compliance with the California Green Building Standards Code.
 - b. Sustainable design submittals are in addition to other submittals.
2. The following information shall be provided:
 - a. Adhesives and Sealants: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.
 - b. Paints and Coatings: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.

1.7 CLOSEOUT SUBMITTALS

- A. Guarantee: Submit subcontractor's guarantee.

1.8 QUALITY ASSURANCE

- A. Contractor / Installer shall have been in business for five (5) years providing/finishing similar size projects and complexity.
- B. Contractor shall be solely responsible for all subgrades built. Any repairs resulting from inadequate compaction is the responsibility of the contractor.
- C. The representatives of the Owner's testing lab will not act as supervisor of construction, nor will they direct construction operations. Neither the presence of the Owner's testing lab representatives nor the testing by the Owner's testing lab shall excuse the contractors or subcontractors for defects discovered in their work during or following completion of the project. Correcting inadequate compaction is the sole responsibility of the contractor.
- D. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.
- E. All materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.
- F. Contractor shall provide verification that asphalt mix temperature meets the requirements of this specification at time of application.
- G. Tests (See Part 1, Article "Testing").

1.9 DELIVERY, STORAGE AND HANDLING

- A. Transport, store and handle in strict accord with the local jurisdiction.

1.10 FIELD CONDITIONS

- A. Environmental Requirements:
 - 1. Base Course: Do not lay base course on muddy subgrade, during wet weather, or when atmospheric temperature is below 40 degrees F.
 - 2. Asphalt Surfacing: Do not apply asphaltic surfacing on wet base, during wet weather, or when atmospheric temperature is below 50 degrees F.

1.11 EXISTING SITE CONDITIONS

- A. Contractor shall acquaint himself with all site conditions. If unknown active utilities are encountered during work, notify Architect promptly for instructions. Failure to notify will make Contractor liable for damage to these utilities arising from Contractor's operations subsequent to discovery of such unknown active utilities.

1.12 PROTECTION

- A. Adequate protection measures shall be provided to protect workmen and passers-by on and off the site. Adjacent property shall be fully protected throughout the operations. Blasting will not be permitted. Prevent damage to adjoining improvements and properties both above and below grade. Restore such improvements to original condition should damage occur. Replace trees and shrubs outside building area disturbed by operations.
- B. In accordance with generally accepted construction practices, the Contractor shall be solely and completely responsible for working conditions at the job site, including safety of all persons and property during performance of the work. This requirement shall apply continuously and shall not be limited to normal working hours.
- C. Any construction review of the Contractor's performance conducted by the owner's representative is not intended to include review of the adequacy of the Contractor's safety measures, in, on, or near the construction site.
- D. Surface Drainage: Provide for surface drainage during period of construction in manner to avoid creating nuisance to adjacent areas. The contractor shall make a reasonable effort on a daily basis to keep all excavations and the site free from water during entire progress of work, regardless of cause, source, or nature of water.
- E. Adjacent streets and sidewalks shall be kept free of mud, dirt or similar nuisances resulting from earthwork operations.
- F. The site and adjacent influenced areas shall be watered as required to suppress dust nuisance. Dust control measures shall be in accordance with the local jurisdiction.

1.13 SEASONAL LIMITS

- A. No fill material shall be placed, spread or rolled during unfavorable weather conditions. When work is interrupted by rains, fill operations shall not be resumed until field tests indicate that moisture content and density of fill are satisfactory.

1.14 TESTING

- A. General: Refer to Section 01 4523 – TESTING & INSPECTION SERVICES AND STRUCTURAL TESTS AND INSPECTIONS LIST, DSA-103.
- B. Geotechnical Engineer: Owner is retaining a Geotechnical Engineer to determine compliance of fill with Specifications, and to direct adjustments in fill operations. Costs of Geotechnical Engineer will be borne by Owner; except those costs incurred for re-tests or re-inspection will be paid by Owner and backcharged to Contractor.

PART 2 - PRODUCTS

2.1 DESIGN AND PERFORMANCE CRITERIA

- A. Sustainable Design:

**ASPHALT CONCRETE PAVING
SECTION 32 1200
3595001000**

1. VOC emissions for field-applied adhesives, sealants, and sealant primers must comply with limits specified in Section 01 6116.
2. VOC emissions for field-applied paints and coatings must comply with limits specified in Section 01 6116.

2.2 MATERIALS

- A. Sterilant: Soil sterilizer shall be CIBA GEIGY's Pramitol 25-E, Treflan EC or Thompson-Hayward Casoron.
 1. Soil sterilizer shall be applied in strict accordance with manufacturer's instructions.
- B. Base Course Aggregate: State Specifications, Section 26, Class 2 aggregate base (3/4" max.).
- C. Asphalt Binder: Steam-refined paving asphalt conforming to State Specifications, Section 92, viscosity grade PG 64-10. Asphalt binder additives for HMA per Caltrans approved list of manufacturers.
- D. Liquid Asphalt Tack Coat: Per CALTRANS section 94.
- E. Surface Course Aggregate: Mineral aggregates for Type "B" asphalt concrete, conforming to State Specifications 39-2.02, Type B, 1/2" maximum, medium gradient. 3/8" maximum gradient at Playcourt.
- F. Seal Coat: shall be a pre-mixed asphalt emulsion blended with select fillers and fibers such as:
 1. "Park-Top No. 302", Western Colloid Products.
 2. "Overcoat", Reed and Gram.
 3. "Drivewalk", Conoco Oil.
- G. Wood Headers and Stakes: Pressure treated.
- H. Pavement Marking: Colors as directed by Architect. Colors of painted traffic stripes and pavement markings must comply with ASTM D6628.
 1. Waterborne traffic line - colors white, yellow and red, State specification PTWB-01R3.
 2. Waterborne traffic line for the international symbol of accessibility and other curb markings – blue, red and green, Federal specification TT-P-1952F.
- I. Precast Concrete Bumpers: 3000 psi at 28 day minimum strength; 48" length unless otherwise indicated; provide with steel dowel anchors and concrete epoxy.
- J. Pavement Epoxy; K-Lite; KtepX-590; Ennis Epoxy HPS2 or an approved equal.
- K. Crack Filler; QPR model CAR08, 10oz asphalt crack filler; Star STA-FLEX Trowel Grade crack filler or approved equal.

**ASPHALT CONCRETE PAVING
SECTION 32 1200
3595001000**

- L. Reclaimed Asphalt Paugment (RAP). HMA Type A or Type B may be produced using RAP providing it does not exceed 15% or the aggregate blend.

2.3 MIXES

- A. General: Plant mixed conforming to State Specifications, Section 39, Type B, 1/2" maximum, medium grading. 3/8" maximum grading shall be used at hardcourt.
- B. Temperature of Hot Mix Asphalt: Not less than 275 degrees F nor more than 325 degrees F when added to aggregate.
- C. Temperature of Hot Mix Aggregate: Not less than 250 degrees F nor more than 325 degrees F when asphalt is added.
- D. Temperature of Hot Mix Asphalt Concrete: Asphalt shall be not less than 285 degrees at time of application, nor more than 350 degrees. Asphalt not meeting the required temperature shall not be used.
- E. Temperature of Warm Mix Asphalt: Mixing and placement; per the approved manufactures heat range recommendations for mixing and placement.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Conditions of Work in Place: Subsurfaces which are to receive materials specified under this Section shall be carefully examined before beginning work hereunder, and any defects therein shall be reported, in writing, to the Architect. Work shall not be started until such defects have been corrected. Starting of work shall imply acceptance of conditions as they exist.

3.2 PREPARATION

- A. Sub-Grade: Clean, shape and compact to hard surface free from elevations or depressions exceeding 0.05' in 10' from true plan. Compact per Section 31 0000. Compaction and moisture content shall be verified immediately prior to placement of aggregate base. Proof roll subbase in presence of geotechnical engineer prior to placement of aggregate base.

3.3 INSTALLATION

- A. Headers:
 - 1. General: Install as edging to asphalt paving, except where adjoining existing pavement, concrete curbs, walks or building.
 - 2. Existing Headers: Remove existing headers where new paving will join existing. Saw cut existing asphalt to provide clean edge.
 - 3. Lines and Levels: Install true to line and grade. Cut off tops of stakes 2-inches below top of header so they will not be visible on completion of job.

**ASPHALT CONCRETE PAVING
SECTION 32 1200
3595001000**

B. Asphalt Paving:

1. Base Course: Install in accord with State Specifications, Section 26. Compact to relative compaction of not less than 95%, ASTM D1557. The material shall be deposited on the subgrade in such a manner as to provide a uniform section of material within five percent tolerance of the predetermined required depth. Deposition will be by spreader box or bottom dump truck to prevent segregation of the material. The material so deposited on the subgrade shall have sufficient moisture which, in the opinion of the Architect is adequate to prevent excessive segregation. It shall then be immediately spread to its planned grade and cross section. Undue segregation of material, excessive drifting or spotting of material will not be permitted. If in the opinion of the site geotechnical engineer, the material is unsuitably segregated, it shall be removed or completely reworked to provide the desired uniformity of the material.
 - a. Moisture content and compaction of base material shall be tested immediately prior to placement of asphalt paving.
2. Sterilant: Apply specified material at manufacturer's recommended rate. Applicator of sterilant material shall be responsible for determining location of all planter areas. Apply specified material over entire base course area just prior to application of asphalt. Follow manufacturer's printed directions.
3. Liquid Asphalt Tack Coat: Apply as "tack coat" to all vertical surfaces of existing paving, curbs, walks, and construction joints in surfacing against which paving is to be placed.
4. Asphalt Concrete Surface Course:
 - a. Comply with State Specifications, 39-6 except as modified below.
 - 1) Final gradation shall be smooth, uniform and free of ruts, humps, depressions or irregularities, with a minimum density of 91% of the theoretical maximum specific gravity determined by California Test Method #309. Maximum variation 1/8 inch in 10' when measured with steel straightedge in any one direction. Test paved areas for proper drainage by applying water to cover area. Correct portions that do not drain properly by patching with plant mix. In no case shall accessible parking spaces or loading and unloading areas exceed 2% slope in any direction.
 - 2) Asphalt material shall be delivered to the project site in a covered condition to maintain acceptable temperature.
5. Placement and adjustment of Frames, Covers, Boxes and Grates: The Contractor shall set and adjust to finish grade all proposed and existing frames, covers, boxes, and grates of all manholes, drop inlets, drain boxes, valves, cleanouts, electrical boxes and other appurtenant structures prior to placement of asphaltic concrete.
6. Water Testing: All paved areas shall be water tested, to check drainage, in the presence of the project inspector prior to placement of seal coat. The surface of asphalt paving shall not vary more than 1/8 inch above or below the grade established on the plans. If variations in grade are present, they will be corrected by overlaying paving and/or pavement removal and replacement as directed by the Architect.

**ASPHALT CONCRETE PAVING
SECTION 32 1200
3595001000**

7. Patching: Cut existing paving square and plumb at all edges to be joined by new paving. In trenches; grind existing asphalt on each side of trench 3" wide x 1/2 the depth of the section. Apply tack coat to vertical surfaces before installing new work. Warp carefully to flush surface, with seal over joints, and feather edge. Sawcut, remove and patch existing paving where cutting is necessary for installation of piping or conduits under Divisions 15, 16 and 33.
8. Seal Coat:
 - a. Seal coat shall be applied no sooner than 30 days from time of asphalt placement.
 - b. Surface Preparation: surface shall be clean of all dirt, sand, oil or grease. Hose down entire area with a strong jet of water to remove all debris. Remove soft, loose, or otherwise damaged areas of asphalt concrete to full depth of damage and replace with compacted asphalt concrete as specified herein. Minor holes and imperfections may be patched using hot mix asphalt or mastic using sand/SS-1-H. Use wire brush for removal of oil and grease; prime with shellac or synthetic resin as recommended by manufacturer of pavement sealer material.
 - c. Seal Coat Seal Application: Thoroughly mix materials in the presence of the onsite inspector. Failure to do so will be cause for rejection. Apply in accordance with manufacturer's written instructions.
 - a. The minimum application rate for each applied coat shall be 30gals per 1000 sq. ft. Two coats of sealcoat will be required.
 - b. Clean-Up and Precautions: As recommended by pavement sealer material manufacturer.
 - d. Clean-Up and Precautions: As recommended by pavement sealer material manufacturer.
- C. Pavement Marking: painted pavement markings shall be done only after the seal coat has thoroughly dried. On clean surfaces to be painted with traffic paint of dust, dirt, grime, oil, rust or other contaminants which will impair the quality of work or interfere with proper bond of paint coats. Surfaces shall be cleaned to the extent and by whatever means that will satisfactorily accomplish the purpose without damage to asphalt concrete. Provide measured layouts, temporary markings, templates, and other means necessary to provide required marking. Prepare and apply paint in accordance with manufacturer's instructions; paint shall be applied by spray and shall achieve complete coverage free from voids and thin spots. Where indicated on the Drawings, paint parking stall strips, lettering, arrows, accessible symbols, playground markings, game striping, maps, etc. on concrete paving or asphalt concrete paving. Paint stripes shall be 4 inches wide (except otherwise indicated) and applied with two (2) coats of herein specified Traffic Line Paint; white (except as otherwise specified or indicated).
 1. International Accessible Symbol: Symbol shall be white figures on a blue background. Blue shall be equal to color No. 15090 in Fed. Std. 595c. Lines and symbols shall be accurately formed and true to line and form; lines shall be straight and uniform in width. Painted edges shall be clean cut and free from raggedness, and corners shall be cut sharp and square. Tolerances: Apply striping within a tolerance 1/2 inch in 50 feet. Apply markings and striping to widths indicated with a tolerance of 1/4 inch on straight sections and 1/2 inch on curved sections.

ASPHALT CONCRETE PAVING
SECTION 32 1200
3595001000

- D. Colors: As directed by Architect
- E. Precast Concrete Bumpers: Install where shown, using steel dowels, and epoxy applied for length to wheel stop without damage to bumpers or asphalt concrete paving.

3.4 CLEANING

- A. Upon completion of work of this Section promptly remove from the working area all scraps, debris and surplus material of this Section.
- B. Clean excess material from surface of all concrete walks and utility structures.

END OF SECTION

*s:\master specifications\division 32 - site improvements\32 1200_asphalt concrete paving.docx
Received from WCEI: December 18, 2020, Format Updated 9-8-21*

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Concrete curbs and gutters.
2. Concrete pavement, sidewalks and ramps.
3. Steel reinforcing for flatwork and curbs.
4. Truncated domes.

1.2 RELATED REQUIREMENTS

- A. Section 01 6116, Volatile Organic Compound (VOC) Restrictions; for VOC limits pertaining to adhesives, sealants, fillers, primers, and coatings.
- B. Section 01 8113, Sustainable Design Requirements, for CAL-Green **[and Collaborative for High Performance Schools (CHPS)]** general requirements and procedures.
- C. Division 31, Earthwork.
- D. Section 32 1200, Asphalt Concrete Paving.

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CALGreen), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- C. American Concrete Institute (ACI):
1. 117: Specification for Tolerances for Concrete Construction and Materials and Commentary.
 2. 211.1: Standard Practice for Selecting Proportions for Normal, Heavyweight and Mass Concrete.
 3. 301: Specifications for Structural Concrete.
 4. 302.1R: Guide to Concrete Floor and Slab Construction.
 5. 305R: Guide to Hot Weather Concreting.
 6. 306R: Guide to Cold Weather Concreting.
 7. 308R: Guide to External Curing of Concrete.
 8. 318: Building Code Requirements for Structural Concrete and Commentary.
 9. 347R: Guide to Formwork for Concrete.
- D. ASTM International (ASTM):

1. A615/A615M: Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement.
 2. A706/A706M: Standard Specification for Deformed and Plain Low-Alloy Steel Bars for Concrete Reinforcement.
 3. C33/C33M: Standard Specification for Concrete Aggregates.
 4. C94/C94M: Standard Specification for Ready-Mixed Concrete.
 5. C143/C143M: Standard Test Method for Slump of Hydraulic-Cement Concrete.
 6. C150/C150M: Standard Specification for Portland Cement.
 7. C260/C260M: Standard Specification for Air-Entraining Admixtures for Concrete.
 8. C309: Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete.
 9. C330/C330M: Standard Specification for Lightweight Aggregates for Structural Concrete.
 10. C494/C494M: Standard Specification for Chemical Admixtures for Concrete.
 11. C618: Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete.
 12. C920: Standard Specification for Elastomeric Joint Sealants.
 13. C1107/C1107M: Standard Specification for Packaged Dry, Hydraulic Cement Grout (Non-Shrink).
 14. C1315: Standard Specification for Liquid Membrane-Forming Compounds Having Special Properties for Curing and Sealing Concrete.
 15. D1751: Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types).
 16. D5893/D5893M: Standard Specification for Cold Applied, Single Component, Chemically Curing Silicone Joint Sealant for Portland Cement Concrete Pavements.
- E. Concrete Reinforcing Steel Institute (CRSI):
1. Manual of Standard Practice.
 2. Placing Reinforcing Bars.
- F. State of California, Department of Transportation (Caltrans):
1. Division of Engineering Services:
 - a. California Test 342: Method of Test for Surface Skid Resistance with the California Portable Skid Test.
 2. Standard Specifications.
 - a. Section 51, Concrete Structures.
 - b. Section 52, Reinforcement.
 - c. Section 73, Concrete Curbs and Sidewalks.
 - d. Section 90, Concrete.
- G. US Government General Services Administration (GSA/SAE):

1. GSA/SAE AMS-STD-595A: Colors Used In Government Procurement.

1.4 ADMINISTRATIVE REQUIREMENTS

A. Submittal Procedures:

1. Action Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
3. Sustainable Design Submittals shall comply with the additional requirements of Section 01 8113, Sustainable Design Requirements.

1.5 ACTION SUBMITTALS

A. Shop Drawings: Joint pattern layout for walks and pavement.

B. Product Data:

1. A complete list of materials proposed to be used for the site concrete work including, but not limited to, sand, gravel, admixtures, surface treatments, coloring agents, sealers, cast-in-place accessories, forming and curing products, concrete mix designs, reinforcing materials, joint materials, curing materials, and detectable warning surface.
2. Manufacturer's descriptive literature for products proposed for use. Include installation instructions, and maintenance instructions.

C. Concrete Mix Design: The Contractor shall submit three copies of each proposed mix design for each class of concrete in accordance with ACI 301, Sections 3.9 "Proportioning on the Basis of Previous Field Experience or Trial Mixture," or 3.10 "Proportioning Based on Empirical Data." The Contractor shall submit a separate mix design for concrete to be placed by pumping, in addition to the mix design for concrete to be placed directly from the truck chute.

1. The following information shall be included in the concrete mix design:
 - a. Proportions of cement, fine and coarse aggregate, and water.
 - b. Water-cement ratio, 28-day compressive design strength, slump, and air content.
 - c. Type of cement and aggregate.
 - d. Special requirements for pumping.
 - e. Range of ambient temperature and humidity for which design is valid.
 - f. Special characteristics of mix, which require precautions in mixing, placing, or finishing techniques to achieve specified finished product.
2. Do not begin concrete production until mixes have been reviewed and approved by Engineer.
 - a. Review of mix design by the Architect and Engineer shall in no way relieve the subcontractor of his responsibility for the performance of the concrete.

D. Qualification Data: For manufacturer

- E. Delivery tickets as specified for ready-mixed concrete.
- F. Sustainable Design:
 - 1. General:
 - a. Submit information necessary to establish and document compliance with the California Green Building Standards Code.
 - b. Sustainable design submittals are in addition to other submittals.
 - 2. The following information shall be provided:
 - a. Adhesives and Sealants: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.
 - b. Paints and Coatings: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.

1.6 CLOSEOUT SUBMITTALS

- A. Guarantee: Submit subcontractor's guarantee.

1.7 QUALITY ASSURANCE

- A. Qualifications:
 - 1. Manufacturer of ready-mixed concrete products shall meet ASTM C94/C94M requirements for production facilities and equipment.
- B. Design, erect, support, brace and maintain formwork and shoring to safely support all loads that might be applied until such loads can be carried by concrete.
- C. The Contractor shall perform work in accordance with ACI 301.
- D. Use only new materials and products.
- E. Single-Source Responsibility: Use materials and products of one manufacturer whenever possible.
- F. Materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.
- G. Testing to determine compliance with the work of this Section will be the responsibility of the Contractor.
 - 1. Cement and reinforcing shall be tested in accordance with CBC Section 1910A. Testing of reinforcing may be waived in accordance with Section 1910A.2 when approved by the Engineer and DSA.
 - 2. Testing will be performed by an independent testing and inspecting agency in accordance with Section 01 4523, Testing and Inspection Services, and paid for by the Owner.
 - 3. Refer to Article FIELD QUALITY CONTROL in Part 3 of this Section for additional requirements.

4. Cost of retests and coring due to low strength or defective concrete will be paid by the Owner and back-charged to the Contractor.
- H. Sieve analysis from testing laboratories identifying rock/sand percentages within the concrete mix; or class 2 aggregate base shall have the current Project name and Project location identified on the report. Outdated analytical reports greater than 90 days old will not be accepted.
- I. Mockups: Provide on-site mockup panels for each type of exposed colored concrete flatwork showing texture and color before proceeding with finish to be used on this Project.
 1. Construct sample panels after review and approval of samples.
 2. Size: Minimum 5 feet square and have at least one longitudinal and one transverse joint unless a more specific note indicates otherwise on Drawings.
 3. Construct sample panels at location approved by Architect.
 4. Construct sample panels in ample time to allow for finishing and curing before requesting Architect to review.
 5. Follow procedures used on accepted samples.
 6. Include saw-cut and tooled joints to match method and appearance proposed for use in completed work.
 7. Prepare successive sample panels as required until finish, color, and appearance is approved by Architect.
 8. Do not remove sample panels until authorized in writing by the Architect and all concrete work has been approved.

1.8 DELIVERY, STORAGE AND HANDLING

- A. Deliver undamaged products to job in manufacturer's sealed containers and/or original bundles with tags and labels intact.
- B. Store materials in protected, dry conditions off of ground and in areas so as to not interfere with the progress of the Work.
- C. Transport, store and handle in strict accordance with the manufacturer's written recommendations.
- D. Store cement in weather tight building, permitting easy inspection and identification. Protect from dampness. Lumpy or stale cement will be rejected.
- E. Aggregates: Prevent excessive segregation, or contamination with other materials or other sizes of aggregate. Use only one supply source for each aggregate stock pile.

1.9 FIELD CONDITIONS

- A. Make and be responsible for all field dimensions necessary for proper fitting, slopes, and completion of work. Report discrepancies to Architect before proceeding.
- B. Do not place concrete during rain without adequate protection.

- C. The Contractor shall conform to ACI 306R when mixing and placing concrete during cold weather. Provide sufficient protection when daily temperatures drop below 40 degrees F.
- D. The Contractor shall conform to ACI 305R when mixing and placing concrete during hot weather. When air temperature exceeds 100 degrees F adjust concrete mix with retarding admixture in design mix, and adequately test and take additional measures as directed by concrete supplier.
- E. The Contractor shall maintain access for vehicular and pedestrian traffic as required for other construction activities. Use temporary striping, flagmen, barricades, warning signs, and warning lights as required.
- F. Placing in hot weather: Comply with ACI 305R. Concrete shall be delivered, placed and finished in a sufficiently short period of time to avoid surface dry checking.
 - 1. Concrete shall not exceed 85 degrees F at time of placement.
 - 2. Concrete shall be kept wet continuously after tempering until implementation of curing compound procedure in accordance with this specification.
 - 3. Evaporation Retarder: Apply evaporation retarder to concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 pounds per square foot per hour, before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.
- G. Placing in Cold Weather: Comply with ACI 306R. Protect from frost or freezing. No antifreeze admixtures are permitted.
 - 1. When placing concrete during freezing or near-freezing weather, mix shall have temperature of at least 50 degrees F but not more than 90 degrees F.
 - 2. Concrete shall be maintained at temperature of at least 50 degrees F for not less than 72 hours after placing or until it has thoroughly hardened.
 - 3. Provide necessary thermal coverings for any flat work exposed to freezing temperatures.

PART 2 - PRODUCTS

2.1 DESIGN AND PERFORMANCE CRITERIA

- A. Contractor shall comply with requirements applicable to this Section for concrete materials, admixtures, bonding materials, curing materials, surface sealers and others as required.
- B. Concrete walking surfaces shall have a coefficient of friction not less than 0.30 and will be subject to testing to verify compliance as specified in Article FIELD QUALITY CONTROL.
 - 1. The coefficient of friction will be measured by California Test 342 before pavement is opened to public traffic, but not sooner than 7 days after concrete placement.

2. Contractor shall notify the Architect and Project Inspector of pavement having a coefficient of friction less than 0.30.
- C. Sustainable Design:
1. VOC emissions for field-applied adhesives, sealants, and sealant primers must comply with limits specified in Section 01 6116.
 2. VOC emissions for field-applied paints and coatings must comply with limits specified in Section 01 6116.

2.2 FORMING MATERIALS

- A. Form Material: Steel, wood, or other suitable material of size and strength to resist movement during concrete placement and to retain horizontal and vertical alignment until removal. Use straight forms, free of distortion and defects. Use flexible spring steel forms or laminated boards to form radius bends as required. The forms shall be of a depth equal to the depth of curbing or sidewalk, and so designed as to permit secure fastening together at the tops. Coat forms with non-staining type coating that will not discolor or deface surface of concrete.
1. Concrete Exposed to View: 5/8-inch minimum APA B-B Plyform, steel or "Sonotube" forms by Sunoco, 888-875-8754, or equal.
 2. Concrete Concealed from View: 5/8-inch minimum APA B-B Plyform, steel or 1 x 8 DF, Number 2 Grade or better.
- B. Form Ties: Snap off metal of fixed length, leaving no metal within 1-1/2 inches of surface and no fractures, spalls or other surface defects larger than 1 inch diameter; manufactured by Burke, Dayton Superior, or equal.
- C. Spreaders: Metal. Wood is not permitted.
- D. Form Coating: Coat forms with non-staining material that will not discolor or deface surface of concrete or leave any residue on concrete that would interfere with surface coating as approved by the Architect.
- E. Chamfer Strips: Rigid polyvinyl chloride, 3/4-inch x 3/4-inch, in maximum possible lengths, manufactured by Burke, Greenstreak, Vulco, or equal.

2.3 REINFORCING MATERIALS

- A. Reinforcement Bars: New billet steel deformed bars conforming to requirements of ASTM A615/A615M or ASTM A706/A706M; Grade 60.
1. Bars for dowels installed through expansion joints or construction joints to existing sidewalks or concrete features shall be smooth or if deformed shall be sleeved on one end for slippage.
- B. Reinforcing Supports: Galvanized metal chairs or spacers or metal hangers, accurately placed 3 feet on center each way, staggered, with each support securely fastened to steel reinforcement in place.

1. Bottom bars in footings may be supported with 3-inch concrete blocks with embedded wire ties.
2. Concrete supports without wire ties will not be allowed.

2.4 CONCRETE MATERIALS

- A. Cement: Portland cement in accordance with ASTM C150/C150M, Type II, low alkali.
- B. Concrete Aggregates: Graded from coarse to fine in accordance with ASTM C33/C33M.
 1. Normal Weight Aggregates: Clean and free from deleterious coatings, clay balls, roots, and other extraneous materials, and in conformance with ASTM C33/C33M, except as otherwise specified. Combined grading shall meet limits of ASTM C33/C33M.
 - a. Size: Not be larger than one-fifth of the narrowest dimension between forms, or larger than three-fourths of the minimum clear spacing between reinforcing bars.
 2. Lightweight Aggregates:
 - a. General: Durable particles suitably processed, washed and screened without adherent coatings, free of materials with deleterious reactivity to alkali in cement, and conforming to ASTM C330/C330M.
 - b. Fine aggregate shall be natural sand, or sand prepared from stone or gravel, with grains free of silt, loam and clay.
- C. Water: Potable, clean, and in accordance with ASTM C94/C94M, free from injurious amounts of oil, acids, alkalis, salts, scale, organic materials or other deleterious matter, and in compliance with ACI 318 Section 26.4.1.3.
- D. Fly Ash: Western Fly Ash, conforming to ASTM C618 for Class N or Class F materials and in accordance with CBC Section 1903A.6.
 1. Class C is not permitted.
 2. Proportions: Not more than 15 percent (by weight) may be substituted for portland cement.

2.5 ADMIXTURES

- A. Water Reducing Admixture: Admixture to improve placing, reduce water cement ratio and ultimate shrinkage; "WRDA 64" by GCP Applied Technologies, or equal conforming to ASTM C494/C494M and ACI 318 Section 3.6.
 1. Water reducing admixture may be used subject to prior approval by the Architect, Engineer, and the Testing Lab.
 2. Proposed product and quantity shall be included in original design mix.
- B. Air-Entraining Admixture: "Daravair 1000" by GCP Applied Technologies or equal conforming to ASTM C260 and ACI 318, section 26.4.1.4.
 1. Proportion air entraining concrete to attain specified minimum 28-day compressive strength.

2. Total air entrainment in concrete shall be not less than 4 percent or more than 6 percent of the volume of concrete.
- C. Glare Reduction Colorant: Concentrated pigment dispersions designed to permanently color concrete; "Chromix L10 Base-Black" by Sika Corporation, or equal. *Was within 2.2 H.1*

2.6 CURING MATERIALS

- A. Clear Curing Compound: Water-based membrane-forming concrete curing compound in accordance with ASTM C309 and C1315; "Aqua Resin Cure Clear" by Burke CO, "1100" by W.R. Meadows, or equal.

2.7 ADDITIONAL MATERIALS AND COMPONENTS

- A. Concrete Bonding Agent: The following, or equal, conforming to ASTM C1059/C1059M.
 1. "Weld-Crete" by Larson Products Corporation, 800-633-6668.
 2. "Daraweld C" by GCP Applied Technologies, 877-423-6491.
- B. Patching Mortar: One-component, trowel applied, migrating-corrosion-inhibitor enhanced, polymer-modified, shrinkage-compensated, fiber reinforced, micro-silica enhanced, cementitious repair mortar for horizontal, vertical, and overhead applications; "Meadow-Crete GPS" by W.R. Meadows, or equal.
- C. Non-Shrink Grout: Premixed, non-metallic, no chlorides, non-staining and non-shrinking conforming to ASTM C1107/C1107M; "MasterFlow 713" by Master Builders Solutions, a division of BASF, 800-433-9517, or equal.
- D. Drainage Rock Base: 3/4-inch aggregate size conforming to Class 2 Aggregate Base as defined in Caltrans Standard Specifications Section 26, or equal clean free-draining gravel or crushed rock as recommended by the Geotechnical Engineer.
- E. Expansion Joint Material: Preformed 3/8-inch fiber material, with bituminous binder manufactured for use as concrete expansion joint material and conforming to ASTM D1751 and approved by Architect.
 1. Furnish joint fillers in one-piece lengths for full width being placed, wherever possible. Where more than one length is required, lace or clip joint-filler sections together.
- F. Joint Sealant for Expansion Joints in Concrete: Weather and UV resistant, single component, cold applied silicone sealant, Type S, conforming to ASTM D5893/D5893M; ASTM C920, Grade P, Class 25, Use T.
 1. Self-Leveling: "DOWSIL 890-SL Silicone Joint Sealant" by Dow Chemical Company, or equal.
 2. At Slopes Exceeding 5 Percent: Non-sagging; "DOWSIL 888 Silicone Joint Sealant" by Dow Chemical Company, or equal.
 3. Color: As standard with manufacturer.

- G. Pre-Formed Plastic Expansion Joint Caps: Polystyrene, with removable tops; "Snap Cap" by W. R. Meadows, Tex-Trude expansion caps, or equal.
- H. Truncated Domes: Vitrified Polymer Composite (VPC) cast-in-place detectable/tactile warning surface tiles complying with Americans with Disabilities Act (ADA) and the California Code of Regulations (CCR) Title 24, Part 2, Chapter 11B; "Armor-Tile", "Access Tile Tactile Systems," or equal.
 - 1. Color: Shall be yellow and approximate 33538 of GSA/SAE AMS-STD-595A in accordance with CBC Section 11B-705.1.1.3.1.
- I. Traffic Paint for Accessibility Striping at Stairs: VOC compliant, water-based, vinyl acrylic copolymer fast drying emulsion and specifically formulated as a traffic marking paint; "Setfast" with "Duckback" abrasive additive by Sherwin-Williams, "SAFE-STRIDE" by Wooster Products, Inc., or equal.
 - 1. Colors: As selected by Architect. [Yellow]
- J. Cast Abrasive Accessibility Strips and Stairs: Extruded aluminum with integral anchor and filled with abrasive granules in epoxy binder; Model ST-SF-N by Nystrom, Inc., 800-547-2635, Type T-24 by American Safety Tread Company, Inc., 800-245-4881, Type WP-24A by Wooster Products, Inc., 330-264-2844, or equal.
 - 1. Colors: As selected by Architect. [Yellow]

2.8 CONCRETE DESIGN AND CLASS

- A. Designed Strength and Classes of Concrete: The following mixes are not applicable to concrete items exceeding 4 feet in height above the adjacent grade.
 - 1. Class "B": Concrete shall have 1 inch maximum size aggregate, shall have 3000 pounds per square inch minimum at 28 day strength with a maximum water to cementitious ratio no greater than 0.50.
 - a. Location of Use: Exterior slabs, including walks, vehicular paved surfaces, manhole bases, poured-in-place drop inlets, curbs, valley gutters, curb and gutter, and other concrete of like nature.
 - 2. Class "D" concrete of 1 inch maximum size aggregate shall have 3500 pounds per square inch 28 day strength with a maximum water to cementitious materials ratio of 0.55.
 - a. Location of Use: Footings and retaining walls not attached to buildings, and planter walls, monument signs, and other site concrete not described for use in Class "B".
- B. Slump Limits: Provide concrete, at point of final discharge of proper consistency as tested in accordance with ASTM C143/C143M with slumps of 4 inches, plus or minus 1 inch.
- C. Mix Design: Concrete shall be designed for strength in accordance with provisions of CBC Section 1905A.

1. Should the Contractor desire to pump concrete, a modified mix design will need to be submitted for review.
 2. Fly ash may be used in concrete to improve workability in amounts up to 15 percent of the total cementitious weight.
- D. Air Entrainment: Provide at concrete paving / flatwork, including concrete ramps and stairs in accordance with local jurisdiction minimum requirements, but no less than 3 percent of the volume of concrete.
- E. Glare Reduction Additive:
1. General:
 - a. Provide at exterior concrete slabs, walks, ramps, stairs, including bleachers, and other exposed flatwork to eliminate glare.
 - b. Omit glare reduction colorant where color hardener, integral color, and stain treatment of concrete are scheduled.
 2. Quantity: As required to match approved sample but not exceed 2 pounds of colorant per cubic yard of concrete.
 3. Add colorant to mix in accordance with manufacturer's printed instructions.
- F. Coloring Agent:
1. Quantity: Add pigment as required to result in hardened concrete color consistent with approved sample but not exceeding maximum dosage per sack of cement as recommended by manufacturer based on total cementitious materials of mix design.
 2. Add pre-mixed colorant bags to mix in accordance with manufacturer's printed instructions.

2.9 MIXING OF CONCRETE

- A. Conform to requirements of CBC Chapter 19A.
- B. Concrete shall be mixed until there is uniform distribution of material and mass is uniform and homogenous; mixer must be discharged completely before the mixer is recharged.
- C. Concrete shall be Ready-Mixed Concrete: Mix and deliver in accordance with the requirements set forth in ASTM C94/C94M and ACI 301. Batch Plant inspection may be waived in accordance with CBC Section 1705A.3.3, when approved by the Project Engineer and DSA.
1. Furnish batch certificates for each batch discharged and used in the work.
 2. Approved Testing Laboratory shall check the first batching at the start of the work and furnish mix proportions to the Licensed Weighmaster.
 3. Licensed Weighmaster shall identify materials as to quantity and to certify to each load by ticket.
 4. Delivery tickets are to accompany each truck and shall be kept in the job superintendent's file. Delivery tickets must indicate the following information or be subject to rejection:

- a. Name of Project.
 - b. Supplier of concrete.
 - c. Truck identity and ticket serial number.
 - d. Date of delivery.
 - e. Brand of cement.
 - f. Cement content.
 - g. Strength classification.
 - h. Batching time.
 - i. Point of deposit.
 - j. Total amount of water.
 - k. Weight of aggregate.
 - l. Daily temperature.
 - m. Number of cubic yards in load.
 - n. Admixture content.
 - o. Name of Contractor.
 - p. Name of driver.
 - q. Time loaded and first mixing of concrete.
 - r. Reading of revolution counter.
 - s. Color additive.
5. Ticket shall be transmitted to Project Inspector by truck driver with load identified thereon. Project Inspector will not accept load without load ticket identifying mix and will keep daily record of pours, identifying each truck, its load and time of receipt, and will transmit two copies of record to DSA.
6. At end of project, Weighmaster shall furnish affidavit to DSA on form satisfactory to DSA, certifying that all concrete furnished is in conformance with proportions established by mix designs.
7. Placement of concrete shall occur as rapidly as possible after batching and in a manner which will assure that the required quality of the concrete is maintained. In no case may concrete be placed more than 90 minutes from batch time.
- a. When air temperature is between 85 and 90 degrees F, reduce maximum batching to discharge time from 90 minutes to 75 minutes.
 - b. When air temperature is above 90 degrees F, reduce maximum batching to discharge time to 60 minutes.
8. Water may be added to the mix only if neither the maximum permissible water-cement ratio nor the maximum slump is exceeded.
- a. The quantity of water used for each batch shall be accurately measured.
 - b. In no case shall more than 10 gallons of water be added to a full 9-yard load, or 1 gallon per yard on remaining concrete within the drum, providing load tag indicates at time of mixing at plant an allowance for additional water.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Confirm general layout, grade, and joint pattern layout with the Architect prior to placing concrete.
- B. Verify that gradients and elevations of the base are correct, and that the base is dry.
- C. Contractor shall report in writing to the Architect prevailing conditions that will adversely affect satisfactory execution of the work of this Section.
 - 1. Do not proceed with work until unsatisfactory conditions have been corrected.
- D. Forms and reinforcements are subject to approval by the Project Inspector as specified in Article FIELD QUALITY CONTROL.

3.2 PREPARATION

- A. Remove frost, water, and other foreign materials from form surfaces, reinforcement, and embedded items against which concrete will be placed.
- B. When the ambient temperature necessitates the use of cold or hot weather concreting, make provisions in advance of concrete placement.
- C. Before placing concrete, clean tools and equipment, and remove debris from areas to receive concrete.
- D. Clean reinforcing and other embedded items of coatings, oil, mud and soil that may impair bond with concrete.
- E. Slab-On-Grade: After subgrade has been approved by Geotechnical Engineer, install specified drainage rock base material to thickness shown. Rock base shall be implemented and compacted in accordance with the Geotechnical Report and recommendations of the Geotechnical Engineer.

3.3 INSTALLATION – FORMWORK

- A. Form material shall be straight, true, sound and able to withstand deformation due to loading and effects of moist curing. Materials which have warped or delaminated, or require more than minor patching of contact surfaces, shall not be reused.
- B. Build forms to shapes, lines, grades and dimensions indicated. Construct formwork to maintain tolerances required by ACI 301. Forms shall be substantial, tight to prevent leakage of concrete, and properly braced and tied together to maintain position and shape. Butt joints tightly and locate on solid backing. Chamfer corners where indicated. Form bevels, grooves and recesses to neat, straight lines. Construct forms for easy removal without hammering, wedging or prying against concrete.
- C. Space clamps, ties, hangers and other form accessories so that working capacities are not exceeded by loads imposed from concrete or concreting operations.

- D. Build openings into vertical forms at regular intervals if necessary to facilitate concrete placement, and at bottoms of forms to permit cleaning and inspection.
- E. Build in securely braced temporary bulkheads, keyed as required, at planned locations of construction joints.
- F. Before placement of reinforcing steel, coat faces of all forms to prevent absorption of moisture from concrete and to facilitate removal of forms. Apply specified material in conformance with manufacturer's written directions.
 - 1. Seal all cut edges.
 - 2. Before re-using form material, inspect, clean thoroughly, and recoat.
- G. Slope tie-wires downward to outside of wall.
- H. Brace, anchor and support all cast-in items to prevent displacement or distortion.
- I. During and immediately after concrete placing, tighten forms, posts and shores. Readjust to maintain grades, levels and camber.
- J. Concrete Paving, Curbs, Curb and Gutters, Ramps:
 - 1. Expansion Joints: Install at locations indicated, and so that maximum distance between joints is 20 feet for exterior concrete unless otherwise shown. Expansion joint material shall be full depth of concrete section. Recess for snap cap and sealant when required.
 - 2. Curbs, Valley Gutter, and Curb & Gutter: Install expansion joints at 60 feet on center, except when placing adjacent to concrete walks, the expansion joints shall align with the expansion joints shown for the concrete walks. Expansion joint material shall be full depth of concrete section. Recess for snap cap and sealant when required.
 - 3. Isolation Joints: 3/8-inch felt between walls and exterior slabs or walks so that paved areas are isolated from all vertical features, unless specifically noted otherwise on plans.
 - 4. Exterior Concrete Paving: Install expansion joints at 20 feet on center maximum, both directions, unless shown otherwise on plans.
 - 5. Ramps: Whether shown or not, all ramps shall have control joints and expansion joints.
 - a. Control joints on ramps shall be aligned and placed in between the vertical posts for the handrails. The curbs, if required shall have control joints that align with the handrail posts.
 - b. Expansion joints shall be placed at the upper, intermediate, and bottom landings.
- K. Inspection: Refer to Article FIELD QUALITY CONTROL.

3.4 INSTALLATION – REINFORCING

- A. General: Reinforcing shall be accurately placed at locations indicated on the drawings within required tolerances and providing required clearances. Reinforcement shall be

secured prior to placement of concrete such that tolerances and clearances are maintained. Coverage shall be in accordance with Section 1907A.7 of the CBC.

1. Reinforcement must be in place before concreting is begun.
 2. Keep a person on the job to maintain position of reinforcing as concrete is placed.
 3. All expansion and construction joints in concrete shall have dowels of size and spacing as shown on the Drawings, or as approved by Architect.
 4. Give notice whenever pipes, conduits, sleeves, and other construction interferes with placement; obtain method of procedure to resolve interferences.
- B. Additional reinforcing steel shall be placed around all utility boxes, valve boxes, manhole frames and covers that are located within the concrete placements.
1. The bars shall be placed so that there will be a minimum of 1-1/2-inch clearance and a maximum of 3-inch clearance. The reinforcing steel shall be placed mid-depth of concrete slab.
- C. At right angles or intersections of concrete walks, additional 2 feet x 2 feet #5, 90 degree bars shall be added at all inside corners for additional crack control. The bars shall be placed 2 inches from concrete forms and supports, at mid-depth of slab.
- D. Reinforcing steel shall be adequately supported by approved devices on centers close enough to prevent any sagging.
- E. Placing Tolerances:
1. In accordance with ACI 301 or CRSI/WCRSI Recommended Practice for Placing Reinforcing Bars, unless otherwise shown.
 2. Clear distance between parallel bars in a layer shall be no less than 1 inch, the maximum bar diameter shall not exceed 1-1/2 times the maximum size of coarse aggregate.
- F. Splices:
1. General: Unless otherwise shown on drawings, splice top reinforcing at midspan between supports, splice bottom reinforcing at supports, and stagger splices. Bar laps shall be wired together. Reinforcing steel laps shall be as follows:
 - a. Length of Lap Splices in Concrete:
 - 1) No. 4 bar: 24 inches minimum.
 - 2) No. 5 Bar: Not less than 62 bar diameters.
 - 3) No. 6 Bar: 56 inches minimum.
 - 4) No. 7 Bars and Larger: Not less than 93 bar diameters.
 - b. All splices shall be staggered at 5 feet minimum from adjacent splices.
- G. Inspection: Refer to Article FIELD QUALITY CONTROL.

3.5 PLACING OF CONCRETE – GENERAL

- A. Adjacent finish surfaces shall be protected at all times during the concrete pour and finishing. Verify that all formwork is tight and leak-proof before concrete is poured. Finish work defaced during the concrete pour and finishing shall be replaced at no extra cost to Owner.
- B. Remove wood chips, sawdust, dirt, loose concrete and other debris just before concrete is to be poured. Use compressed air for inaccessible areas. Remove all standing water from excavations.
- C. Transport concrete from mixer to place of final deposit as rapidly as practicable by methods which will prevent separation or loss of ingredients. Deposit as close as practicable in final position to avoid re-handling or flowing. Partially hardened concrete must not be deposited in work. Concrete shall not be wheeled directly on top of reinforcing steel.
- D. Keep excavations free of standing water, but moisture condition sub-grade before concrete placement.
- E. Placing: Once started, continue concrete pour continuously until section is complete between predetermined construction joints. Prevent splashing of concrete onto adjacent forms or reinforcement and remove such accumulation of hardened or partially hardened concrete from forms or reinforcement before work proceeds in that area. Free fall of concrete shall not to exceed 4'-0" in height. If necessary, provide lower openings in forms to inject concrete and to reduce fall height.
- F. Remove form spreaders as placing of concrete progresses.
- G. Place footings as monolithic and in one continuous pour.
- H. Compacting: Concrete shall be compacted by mechanical vibrators.
 - 1. Concrete shall be thoroughly worked around reinforcement and embedded fixtures and into corners of forms.
 - 2. Vibrating shall not be applied to concrete which has already begun to initially set or be continued so long as to cause segregation of materials.

3.6 REMOVAL OF FORMS

- A. Remove without damage to concrete surfaces.
 - 1. Sequence and timing of form removal shall insure complete safety of concrete structure.
 - 2. Forms shall remain in place for not less than the following periods of time. These periods represent cumulative number of days during which temperature of air in contact with concrete is 60 degrees F and above.
 - a. Vertical Forms of Foundations, Walls and All Other Forms Not Covered Below: 5 days.
 - b. Concrete Paving Edge Screeds or Forms: 7 days.

3. Concrete shall not be subjected to superimposed loads (structure or construction equipment) until it has attained its full design strength and not for a period of at least 21 days after placing. Concrete systems shall not be subjected to construction loads in excess of design loads.
- B. Patching: Install specified patching mortar per manufacturer's recommendations. Repairs to defective concrete which affect the strength of any structural concrete member or component are subject to approval by the architect and DSA.

3.7 CONCRETE PAVING

- A. Concrete paving shall be formed and finished to required line and grades true and flat with a maximum tolerance of 1/8-inch in 10 feet for flatness and to slopes indicated.
- B. Concrete vibrator shall be used to assist concrete placement. Contractor shall have spare concrete vibrator on site during concrete placement.
- C. Thoroughly water and soak the subgrade of exterior concrete paving, curbs, curb and gutters, with multiple daily waterings for at least three days or as required to achieve required moisture content prior to the concrete pour in order to place the subgrade soils in full expansion.
 1. Provide damming as required to keep standing water within the formed area and to allow for proper saturation and full expansion of the subgrade soils.
 2. Remove standing water before concrete placement.
- D. Construction Joints:
 1. Keep exposed concrete face of construction joints continuously moist from time of initial set until placing of concrete; thoroughly clean contact surface by chipping entire surface not earlier than 5 days after initial pour to expose clean hard aggregate solidly embedded, or by approved method that will assure equal bond, such as green cutting.
 2. If contact surface becomes contaminated with soil, sawdust or other foreign matter, clean entire surface and re-chip entire surface to assure proper adhesion.

3.8 FINISHING

- A. Concrete Paving: Finish surface as required by ACI 302.1R using manual and vibrating screeds to place concrete level and smooth.
 1. Under no circumstances shall water be added to the top surface of freshly placed concrete.
 2. Use "jitterbugs" or other special tools designed for the purpose of forcing the course aggregate below the surface leaving a thick layer of mortar 1 inch in thickness.
 3. After tamping the concrete, wood float surface to a true and even plane.
 4. After floating with a wood bull float, make 2 passes with a steel Fresno trowel to start sealing the concrete surface.

5. While concrete is still wet but sufficiently hardened to bear a persons' weight on knee boards, start troweling with a steel hand trowel or a machine trowel in larger areas. Use sufficient pressure to bring moisture to surface.
 6. After surface moisture has disappeared, finish concrete utilizing steel, hand or power trowel.
 7. Completed surface shall be free from trowel marks, depressions, ridges or other blemishes. Tolerance for flatness shall be 1/8-inch in 10 feet.
 8. Provide final finish as follows, unless otherwise indicated:
 - a. Medium Broom Finish: Typical finish to be used at all exterior walks, stairs and ramps. Brooming direction shall run perpendicular to slope to form non-slip surface.
- B. Curb Finish: Steel trowel.
- C. Joints and Edges:
1. Mark-off exposed joints, where indicated, with 1/4-inch radius x 1 inch deep jointer or edging tool. Joints shall be clean, cut straight and parallel or square with respect to concrete walk edge.
 2. Tool edges of control joints, walk edges, and wherever concrete walk adjoins other material or vertical surfaces. Expansion joints shall be constructed as detailed on plans.
 3. The expansion joints shall be full depth as shown in the Drawings. Failure to do so will result in non-compliance and shall be immediately machine cut by the Contractor at its expense.

3.9 CURING

- A. Formed Concrete:
1. Keep forms and top on concrete between forms continuously wet until removal of forms, 7 days minimum.
 2. Maintain exposed concrete in a continuous wet condition for 14 days following removal of forms.
- B. Concrete Paving, Curb, Curb and Gutter, Valley Gutter:
1. Cure utilizing curing compound. If applicable, the Contractor shall verify that the approved curing compound is compatible with the approved colorant system.
 2. Curing compound shall be applied in a wet puddling application. Spotty applications shall be reason for rejection and possibly concrete removal and replacement at the contractor's expense with no compensation from the Owner.
- C. No curing compound shall be applied to areas scheduled to receive resilient track surface including, curbs, ramps, runways, and similar items.

3.10 DEFECTIVE CONCRETE

- A. General:

1. Determination of defective concrete shall be made by the Architect or Engineer whose opinion shall be final in identifying areas to be replaced, repaired or patched.
2. As directed by Architect, cut out and replace defective concrete.
 - a. Defective concrete shall be removed from the site.
 - b. No patching is to be done until surfaces have been examined by Architect and permission to begin patching has been provided.
 - c. Permission to patch an area shall not be considered waiver of right by the Owner to require removal of defective work, if patching does not, in opinion of Architect, satisfactorily restore quality and appearance of surface.
 - d. Remove and replace concrete if repair to an acceptable condition is not feasible.

B. Defective Concrete Is:

1. Concrete that does not match the approved mix design for the given installation type.
2. Concrete not meeting specified 28-day strength.
3. Concrete which contains rock pockets, voids, spalls, transverse cracks, exposed reinforcing, or other such defects which adversely affect strength, durability or appearance.
4. Concrete which is incorrectly formed, out of alignment or not plumb or level, or outside of the maximum tolerance for flatness and slopes indicated.
5. Concrete containing embedded wood or debris.
6. Concrete having large or excessive patched voids which were not completed under Architect's direction.
7. Concrete not containing required embedded items.
8. Concrete with excessive shrinkage, transverse cracking, crazing, curling; or defective finish.
9. Concrete that is unsuitable for placement or has set in truck drum for longer than 90 minutes from the time it was batched.
10. Concrete where expansion joint filler that is not isolating the full depth of the concrete section, and not recessed as required for backer rod and sealant where required.
11. Concrete that is excessively wet or excessively dry and will not meet the minimum or maximum slump required per mix design.
12. Finished concrete with oil stains from equipment use, and or rust spots that cannot be removed.
13. Concrete with control joints (weakened planed joints) that do not meet the required minimum depth shown on the drawings.
14. Concrete not meeting slip-resistance requirements.

C. Flatwork: The Owner reserves the right to survey the flatwork, to determine if flatwork is outside of the maximum tolerance for flatness and slopes as indicated.

1. If the flatwork is found to be out of tolerance, then the Contractor is required to replace concrete at no additional expense to the Owner.
2. Determination of flatwork flatness, surveying and remedial work must be completed far enough in advance so that the project schedule is maintained, delays are avoided, and the new flatwork or flatwork repairs are properly cured.
3. The Contractor will be responsible for reimbursing the Owner for costs associated with re-surveying to verify compliance of work remediated by the Contractor.

3.11 SEALANT

- A. Apply sealant in compliance with manufacturer's instructions, using hand guns or pressure equipment with proper nozzle size, on clean, dry, properly prepared substrates.
- B. Force sealants into joint against sides of joint to make uniform. Avoid pulling of the sealant from the sides. Fill sealant space completely with sealant.
- C. Finished joints shall be straight, uniform, smooth, and neatly finished.
- D. Remove any excess sealant from adjacent surfaces of joints utilizing the manufacturer's recommended solvent and cleaning processes. Leave the work in a neat, clean condition.

3.12 FIELD QUALITY CONTROL

- A. Inspection of Forms and Reinforcing:
 1. Approval of forms and reinforcing steel must be received from Project Inspector prior to pouring concrete.
 2. Notice of readiness to place first pour shall be given to Project Inspector, DSA, Architect, and Engineer not less than 48 hours prior to placement of concrete to allow for inspection.
 3. Pouring of concrete shall not proceed prior to completing requested adjustments to forms and reinforcing and without approval of Project Inspector.
- B. Testing of Concrete:
 1. Frequency and Samples for Testing:
 - a. Four identical cylinder samples for strength tests of each class of concrete placed each day shall be taken not less than once a day, or not less than once for each 50 cubic yards of concrete, or not less than once for each 2,000 square feet of surface area for slabs or walls.
 - b. In addition, samples for strength tests for each class of concrete shall be taken for seven-day tests at the beginning of the concrete work or whenever the mix or aggregate is changed.
 2. Testing:
 - a. Slump: Each truck's concrete shall be tested for slump before concrete is placed.
 - b. Strength:

- 1) Tests for strength will be conducted by Testing Agency on one cylinder at 7 days and two cylinders at 28 days. The fourth remaining cylinder will be available for testing at 56 days if the 28-day cylinder test results do not meet the required design strength.
 - 2) On a given project, if the total volume of concrete is such that the frequency of specified testing would provide less than five strength tests for a given class of concrete, tests shall be made from at least five randomly selected batches or from each batch if fewer than five batches are used.
- C. Slip-Resistance Testing: Owner's Testing Agency will perform testing on flatwork to verify compliance with specified slip-resistance.
1. The coefficient of friction will be measured by California Test 342 before pavement is opened to public traffic, but not sooner than 7 days after concrete placement
 2. Where paving is determined to have a coefficient of friction less than 0.30, Contractor is to repair and/or replace these surfaces at no cost to Owner.

3.13 CLEANING

- A. Upon completion of work of this Section promptly remove from the working area all scraps, debris and surplus material of this Section.
- B. Clean excess material from surface of all concrete walks and utility structures.
- C. Power wash concrete surfaces to remove stains, dried mud, tire marks, and rust spots.
- D. Comply with any additional requirements of additive manufacturer for colored concrete.

3.14 PROTECTION

- A. Graffiti-resistant Coating:
 1. Surface Preparation: Prepare concrete surface to receive graffiti-resistant coating specified in Section 09 9623, Graffiti-Resistant Coatings, where indicated.
 2. Concrete must be clean, dry, and free of efflorescence and dust.
- B. Protect work and materials of this Section prior to and during installation, and protect the installed work and materials of other trades.
- C. In the event of damage during construction, make all repairs and replacements necessary to the approval of the Architect, at no additional cost to the Owner.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Chain link fences
 - 2. Gates and gate hardware.

1.2 RELATED REQUIREMENTS

- A. Section 01 6116, Volatile Organic Compound (VOC) Restrictions, for VOC limits pertaining to adhesives, sealants, fillers, primers, and coatings.
- B. Section 01 8113, Sustainable Design Requirements, for CAL-Green general requirements and procedures.
- C. Section 32 1600, Site Concrete.
- D. Section 08 7100, Door Hardware, for padlocks.

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CAL Green), edition as noted on the drawings, as adopted by the California Division of the State Architect (DSA).
- C. Chain Link Fence Manufacturers' Institute (CLFMI):
 - 1. Products Manual.
- D. ASTM International (ASTM):
 - 1. A153: Zinc Coating (Hot Dip) on Iron and Steel Products.
 - 2. A392: Zinc Coated Steel Chain Link Fence Fabric.
 - 3. A653/A653M: Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
 - 4. A780/A 780M: Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings.
 - 5. C33/C33M: Standard Specification for Concrete Aggregates.
 - 6. C94: Ready-mixed Concrete.
 - 7. C150/C150M: Standard Specification for Portland Cement.
 - 8. F668: Poly Vinyl Chloride (PVC) Coated Steel Chain Link Fence Fabric.
 - 9. F934: Standard Colors for Poly Vinyl Chloride (PVC) Coated Chain Link.
 - 10. F969: Standard Practice for Construction of Chain-Link Tennis Court Fence.

CHAIN LINK FENCES AND GATES
SECTION 32 3113
3595001

11. F1083: Pipe, Steel, Hot-Dipped Zinc Coated (Galvanized) Welded, for Fence Structures.

1.4 ADMINISTRATIVE REQUIREMENTS

A. Submittal Procedures:

1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
3. Sustainable Design Submittals shall comply with the additional requirement of Section 01 8113, Sustainable Design Requirements.

1.5 ACTION SUBMITTALS

- A. Shop Drawings: Submit showing all parts, connections and anchorages, adjacent materials, fully dimensioned and noted. Indicate plan layout, spacing of components, post foundation dimensions, hardware anchorage and schedule of components.
- B. Products Data: Submit list and complete descriptive data of all products proposed for use. Include manufacturer's specifications, published warranty or guarantee, installation instructions, and maintenance instructions.
- C. Samples:
1. Chain-link fabric, approximately 12 inches square, in selected color.
 2. Hardware and fittings if requested by Architect.

1.6 INFORMATIONAL SUBMITTALS

- A. Sample of manufacturer's warranty.
- B. Sustainable Design:
1. General:
 - a. Submit information necessary to establish and document compliance with the California Green Building Standards Code.
 - b. Sustainable design submittals are in addition to other submittals.
 2. The following information shall be provided:
 - a. Paints and Coatings: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.

1.7 CLOSEOUT SUBMITTALS

- A. Warranty/Guarantee: Submit executed warranty and Subcontractor's guarantee.

1.8 QUALITY ASSURANCE

- A. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.
- B. Use materials and products of one manufacturer whenever possible.
- C. All materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.

1.9 DELIVERY, STORAGE AND HANDLING

- A. Deliver undamaged products to job in manufacturer's sealed containers and/or original bundles with tags and labels intact.
- B. Store materials in protected, dry conditions off of ground and in areas so as to not interfere with the progress of the work.
- C. Transport, store and handle in strict accord with the manufacturer's written recommendations.

1.10 FIELD CONDITIONS

- A. Make and be responsible for all field dimensions necessary for proper fitting and completion of work. Report discrepancies to Architect before proceeding.

1.11 WARRANTY

- A. Manufacturer: In addition to the Contractor's and Subcontractor's Guarantee, furnish Owner with manufacturer's fully executed written warranty for chain link fencing against defects in materials and workmanship, including the following:
 - 1. Windscreen: 3 years.

PART 2 - PRODUCTS

2.1 DESIGN AND PERFORMANCE CRITERIA

- A. Industry Standards: Materials and installation shall conform to the requirements of the Chain Link Fence Manufacturers Institute (CLFMI) "Product Manual."
- B. Regulatory Requirements: Pedestrian gates and related hardware shall comply with applicable codes, including provisions for accessibility required by CBC and the Americans with Disabilities Act "Designs for Accessible Design." Comply with the most stringent.
- C. Use new components **[,except existing fence indicated to be relocated,]** free from defects affecting service and appearance.
- D. Sizes specified or shown are minimum.

CHAIN LINK FENCES AND GATES

SECTION 32 3113

3595001

- E. Provide ferrous material except as otherwise indicated or specified.
- F. Sustainable Design:
 - 1. VOC emissions for field-applied paints and coatings must comply with limits specified in Section 01 6116.

2.2 WORKMANSHIP

- A. Galvanizing: Hot dip galvanize ferrous materials after fabrication. Repair zinc coating damaged in shop or during field erection by re-coating with hot repair compound, Re Galv, Galvalloy, Galveweld-alloy, or equal, applied in accord with manufacturer's recommendations.

2.3 MATERIALS

- A. Vinyl Coated Chain Link Fabric: Steel wire with no less than 1.20 ounce of zinc coating per square foot of surface area, covered with color coating of polyvinyl chloride no less than 15 mils thick fusion method with breaking strength of 1200 pounds (Class 2b), and complying with ASTM F668.
 - 1. Typical:
 - a. Wire Diameter: 9 gage, coated size.
 - b. Mesh Opening: 2 inches.
 - 2. Edges: Knuckle fabric at bottom and at top selvage.
 - 3. Fabric widths shall be one piece.
 - 4. Color of PVC Coating: In compliance with ASTM F934, black.
- B. Security Fabric: 16 gauge galvanized sheet metal in conformance with ASTM A653/A653M, 1.3 pounds per square foot, with round hole perforations; McNichols item number 1431141638 as specified and the basis of design, or equal.
 - 1. Perforations shall be 3/16" holes on a 1/4" stagger.
 - 2. Open Area: 51 percent.
 - 3. Finish: Prime and paint as specified in Section 09 9100, Painting, prior to installation.
- C. Security Fabric U-Edging: 14 gauge. galvanized hot rolled U shaped edging, 1 inch tall face x 3/8 inch opening width; McNichols quality U-Edging, item number 4003801410 as specified and the basis of design, or equal.
- D. Round Steel Pipe Fence Framework:
 - 1. Round steel pipe and rail, Schedule 40 standard weight pipe, in accordance with ASTM F1083, 1.8 oz/sq. ft (550 g/sq. m) hot dip galvanized zinc exterior and 1.8 oz/sq. ft (550 g/sq. m) hot dip galvanized zinc interior coating.
 - a. Regular Grade: Minimum steel yield strength 30,000 psi (205 MPa)
 - b. High Strength Grade: Minimum yield strength 50,000 psi (344 MPa)

- E. Line Posts:
 - 1. Without Slats or Windscreen: Regular Grade.
 - a. To 8'-0" High Maximum: 2-3/8 inch outside diameter pipe at 3.65 pounds per linear foot.
- F. End, Corner and Pull Posts: End, corner and pull posts shall also comply with gate post requirements, where occurs.
 - 1. Without Slats or Windscreen: Regular Strength.
 - a. To 8'-0" High Maximum: 2-7/8 inch outside diameter pipe at 5.79 pounds per linear foot.
- G. Gate Posts, Single Leaf: Gate posts shall also comply with End, Corner and Pull Post requirements.
 - 1. To 6 Feet Wide: 2-7/8 inch outside diameter pipe at 5.79 pounds per linear foot.
- H. Post caps: Cast or malleable iron ball or acorn shape; with opening for top rail.
- I. Top Rail, Bottom Rails, and Braces: 1-5/8" outside diameter pipe at 2.27 pounds per linear foot., or 1-5/8 inch x 1-1/4 inch roll formed section, 14 gauge.
 - 1. Brace Assembly:
 - a. Equally spaced between top rail and bottom fabric selvage and run from end, gate, or corner post to first line posts with suitable malleable iron fittings.
 - b. Truss from line post to end, gate, or corner post with 3/8 inch round rod.
- J. Coating for Fencing Components, Including Posts: Polyester powder coating, 3 to 4 mils thick, applied by the electrostatic spray process and baked at 450-500 degrees until cured; with 55 to 70 gloss.
 - 1. Color: Black.
- K. Bands: 14 gauge x 1 inch wide steel spaced 15 inches on center. for securing stretcher bars to end and gate posts.
 - 1. Bands may be used in conjunction with special fitting for securing rails to end and gate posts.
 - 2. Chamfer to ease projecting edges of bands.

2.4 GATES

- A. Frames:
 - 1. Gate Leaves to 6 Feet Wide: 1-5/8 inch outside diameter pipe at 2.27 pounds per linear foot.
 - 2. Gate Leaves Over 6 Feet Wide: 2 inch outside diameter pipe at 2.72 pounds per linear foot.

CHAIN LINK FENCES AND GATES

SECTION 32 3113

3595001

3. Provide additional horizontal and vertical pipe or tube as necessary to assure proper gate operation and attachment of fabric and hardware.
- B. Diagonal Bracing: Provide adjustable length 3/8 inch truss rods on non-welded gate frames and welded gate frames where corner rigidity is insufficient to insure no sag.
- C. Fabric: As specified for fence.
- D. Gate Assembly:
 1. Weld or assemble gate frame with malleable or pressed steel fittings and rivets to provide rigid connections.
 2. Install fabric with stretcher bars at vertical edges, which may also be used at top and bottom edges.
 3. Securely attach stretcher bars and fabric to frame on all sides at 15 inches on center.
 4. Attach hardware with rivets or by other means which will provide security against removal.
- E. Gate Hardware:
 1. General: Hardware at disabled accessible gates shall meet accessibility, including mounting, of the ADA and CBC. Comply with the most stringent.
 2. Hinges: Malleable iron, pressed or forged steel, non-liftoff type, easy noiseless operation and long wear, offset to permit 180 degree gate opening.
 - a. Provide 1-1/2 pair hinges for each leaf over 6 feet nominal height.
 - b. Ball and socket hinges not acceptable.
 3. Fork Latch: Malleable iron, drop fork latch which permits operation of the gate from either side, with padlock eye provided as integral part of latch.
 4. Panic / Lever Hardware: At gates to receive panic hardware or lever locksets, provide galvanized iron lockset boxes, backing plates or mounting plates as required for permanent, vandal resistant mounting.
 5. Kick Plates: 10 inches tall x width of gate x 14 gauge minimum, smooth uninterrupted surfaced, galvanized steel.
 - a. Mount on the bottom edge of gate at the push side. Mount on both sides at two-way swing gates.
 - b. Bottom edge of plate shall be not more than 3 inches above the top of the walk.
 - c. Plate shall be welded to the fence frame and shall allow the gate to be opened by a wheelchair footrest without creating a trap or hazardous condition.
 - d. Provide at pedestrian gates that are within the disabled accessible path of travel
 6. Gate Stop and Holder: Malleable iron.
 - a. Stop shall automatically engages gate frame and holds it in open position.
 - b. Provide at vehicle gates.

7. Double Gates: Provide cane bolt and ground set keeper with locking device and padlock eyes designed as integral part of latch, requiring one padlock for locking both leaves.

2.5 ADDITIONAL MATERIALS AND COMPONENTS

- A. Galvanizing Repair: Zinc coating damaged in shop or during field erection shall be by re-coated using a hot repair compound; "Regalv" repair stick by Rotometals, San Leandro, CA, or equal, applied in accordance with manufacturer's recommendations.
- B. Concrete:
 1. Materials:
 - a. Portland cement, ASTM C 150.
 - b. Aggregate: ASTM C33.
 - c. Water: Potable and free from substances harmful to concrete.
 2. Mix materials to obtain low slump concrete with 28 day compressive strength of 2,500 psi.
 - a. Maximum Size Aggregate: 1-1/2 inch.
 - b. Re-tempering not permitted.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. General:
 1. Execute work in accord with best trade practice for industrial fence installations.
 2. Make welds neat and secure, grind off excess exposed metal.
 3. Securely set posts plumb in alignment at proper depth and height, and rigid bracing where needed; install fabric under tension and securely tie to posts, rails and braces.
 4. Gates shall move freely without sag.
- B. Setting Posts:
 1. General: Space posts as indicated but not more than 10 feet on center.
 2. Pour and tamp concrete leaving no voids.
 - a. Check posts for vertical and top alignment and hold in position.
 - b. Dome top of concrete and trowel smooth to shed water away from post.
 - c. Align posts in footings as follows:
 3. Without Slats or Windscreen: Footings for End, corner and pull posts shall also comply with gate post requirements, where occurs.
 - a. Line Posts to 8'-0" High Maximum: 1'-0" diameter, 3'-3" minimum embedment.

CHAIN LINK FENCES AND GATES

SECTION 32 3113

3595001

- b. End, Corner and Pull Posts to 8'-0" High Maximum: 1'-0" diameter, 4'-3" minimum embedment.
- 4. Single Leaf Gates: Footings for gate posts shall also comply with End, Corner and Pull Post requirements.
 - a. To 6 Feet Wide: 12 inch diameter, 36 inch embedment.
- C. Where posts occur adjacent to structures or other work where concrete foundations may conflict with post footing, block out to allow post installation or use off-set post. Hold post 4 inches clear from face of structure.
- D. Fabric: Leave about 1-1/2 inches between ground and bottom barbs.
 - 1. Pull fabric taut and tie to posts, rails **[and tension wires]**.
 - 2. Install fabric on security side of fence.
 - 3. Fabric shall remain under tension after pulling force is released.
- E. Gates:
 - 1. Install gates plumb, level and secure, with full swing or slide without interference.
 - 2. Install ground set items in substantial concrete mass for adequate anchorage.
- F. Tie Wires:
 - 1. Install with one tight turn to hold fabric firmly to frame.
 - 2. Bend ends of wire inward to prevent hazard to persons or apparel.
- G. Fasteners:
 - 1. Install nuts for tension band and hardware bolts on side of fence opposite fabric side.
 - 2. Spoil ends of bolts to prevent removal of nuts.

3.2 ADJUSTING

- A. Repair exposed zinc coatings damaged in shop or during field erection using specified repair system and in compliance with ASTM A 780,
- B. Adjust gated hardware for smooth operation and lubricate where necessary.

END OF SECTION

*p:\sacramento\3595 tracy unified school district\001-000_villalovoz es new shade structures\08 specifications\06 spec\04 final\ villalovoz\32 3113_chain link fences and gates.docx
Last Updated: February 25, 2022*

PART 1 - GENERAL

1.1 SUMMARY

A. Scope of Work:

1. Furnish all labor, materials, tools, equipment, and transportation required to perform and complete the installation of an automatic sprinkler irrigation system, including all piping, sprinkler heads, controls, connections, testing, etc. as shown on the Drawings and as specified herein. The water source for this project is potable water.
2. Utilize and accept as standards manufacturer's recommendations and/or installation details for any information not specifically detailed on the Drawings.

1.2 RELATED REQUIREMENTS

- A. Section 01 6116, Volatile Organic Compound (VOC) Restrictions, for VOC limits pertaining to adhesives, sealants, fillers, primers, and coatings.
- B. Section 01 8113, Sustainable Design Requirements, for CAL-Green general requirements and procedures.
- C. Section 31 0000, Earthwork.
- D. Section 31 2333, Trenching and Backfilling.
- E. Section 32 9000, Landscaping.

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CALGreen), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).

1.4 ADMINISTRATIVE REQUIREMENTS

A. Submittal Procedures:

1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
3. Sustainable Design Submittals shall comply with the additional requirements of Section 01 8113, Sustainable Design Requirements

**IRRIGATION
SECTION 32 8000
3595001**

B. Pre-Installation Meeting:

1. Request and hold a pre-installation meeting prior to beginning the work of this Section. Parties required to be in attendance are the Landscape Contractor, Project Inspector, Owner's Representative, and the Landscape Architect.

1.5 ACTION SUBMITTALS

- A. Product names are used as standards; provide proof as to equality of any proposed material and do not use other materials or methods unless approved in writing by the Owner's Representative. Submit no more than one request for substitution for each item. The decision of the Owner's Representative is final.
- B. Use equipment capacities specified herein as the minimum acceptable standards.
- C. List materials in the order in which they appear in Specifications; include substitutions. Submit the list for approval by the Owner's Representative.
- D. Make any mechanical, electrical, or other changes required for installation of any approved, substituted equipment to satisfaction of Owner's Representative and without additional cost to Owner. Approval by Owner's Representative of substituted equipment and/or dimensional drawing does not waive these requirements.
- E. Do not construe approval of material as authorization for any deviations from Specifications unless attention of Owner's Representative has been directed to specified deviations.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data for the following:
 1. For landscape contractor.
- B. Sample of manufacturers' warranty.
- C. Record of Pre-Installation Meeting.
- D. Sustainable Design:
 1. General:
 - a. Submit information necessary to establish and document compliance with the California Green Building Standards Code.
 - b. Sustainable design submittals are in addition to other submittals.
 2. The following information shall be provided:
 - a. Adhesives and Sealants: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.
 - b. Paints and Coatings: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.

1.7 CLOSEOUT SUBMITTALS

- A. Warranty/Guarantee: Submit executed warranty and subcontractor's guarantee.
- B. Maintenance and Operating Instructions:
 - 1. Furnish operating maintenance instructions bound in a hardback binder and indexed. Start compiling data upon approval of list of materials. Do not request final inspection until booklets are approved by Owner's Representative.
 - 2. Incorporate the following information in these sets:
 - a. Complete operating instructions for each item of irrigation equipment.
 - b. Typewritten maintenance instructions for each item of irrigation equipment.
 - c. Manufacturer's bulletins which explain installation, service, replacement parts, and maintenance.
 - d. Service telephone numbers and/or addresses posted in an appropriate place as designated by Owner's Representative.
- C. Record Drawings.

1.8 QUALITY ASSURANCE

- A. Qualifications: Work must be complete by a licensed Landscape Contractor. Provide proof of five years' continuous experience in landscaping and irrigation of projects of similar size.
- B. Certification: Ensure that the contractor installing the Central Control System is trained and certified in the installation of the Central Control System. The training and certification must have been completed within two years prior to the installation date.
- C. Work Force: Ensure that an experienced foreman is present at all times during installation. Keep the same foreman and workers on the job from commencement to completion.
- D. Reviews: Specifically request reviews of all items listed in Article INSPECTION REQUIREMENTS, prior to progressing to the next level of work.
- E. Standards:
 - 1. Provide work and material in full accordance with the rules and regulations of the National Electric Code; the Uniform Plumbing Code; and other applicable state or local laws or regulations.
 - 2. Furnish, without extra charge, additional material and labor required to comply with these rules and regulations, though the work may not be specifically indicated in the Specifications or Drawings.
 - 3. Where the Specification requirements exceed those of the above-mentioned codes and regulations, comply with the requirements in the Specifications.

**IRRIGATION
SECTION 32 8000
3595001**

1.9 DELIVERY, STORAGE AND HANDLING

- A. Transport, store and handle in strict conformance with the manufacturer's written recommendations.
- B. Deliver undamaged products to job in manufacturer's sealed containers and/or original bundles, with tags and labels intact. All material containers or certificates shall be clearly marked by manufacturer as to contents for inspection.
- C. Store materials in original undamaged packages and containers, inside well-ventilated area protected from weather, moisture, soilage, extreme temperatures, and humidity. Lay flat, blocked off ground.
- D. Use all means necessary to protect irrigation system materials before, during, and after installation and to protect related work and material.
- E. Handle plastic pipe carefully, especially protecting it from prolonged exposure to sunlight. Store pipe on beds that are the full length of the pipe, and keep pipe flat.

1.10 FIELD CONDITIONS

- A. Information on Drawings relative to existing conditions is approximate. During progress of construction, make deviations necessary to conform to actual conditions, as approved by Owner's Representative, without additional cost to Owner. Accept responsibility for any damage caused to existing services. Promptly notify Owner's Representative if services are found which are not shown on Drawings.
- B. Protect existing trees-to-remain as specified in "Existing Tree Protection" in Article PREPARATION, in Part 3 of this Section.
- C. Protect existing utilities within construction area. Repair damages to utility lines that occur as a result of operations of this work.
- D. Verify dimensions at building site and check existing conditions before beginning work. Make changes necessary to install work in harmony with other crafts after receiving approval by Owner's Representative.

1.11 INSPECTION REQUIREMENTS

- A. Obtain verification from Project Inspector for the following at the appropriate times during construction and prior to further progression of work in this Section:
 - 1. Pressure testing of all mainlines and lateral lines (See "Hydrostatic Tests – Open Trench" in Article FIELD QUALITY CONTROL, in Part 3 of this Section),
 - 2. Trench depth,
 - 3. Sleeves under pavement,
 - 4. Flushing of all mainlines and lateral lines,
 - 5. Backfill and pipe bedding,

6. Layout of heads,
 7. Operation of system and coverage adjustments (with Landscape Architect) after system is fully automated and operational, backfill of trenching is completed, and surface has been restored to original grades.
- B. In case of failure to obtain any verification by the Project Inspector as required above, remove and replace work as necessary to obtain the verification at no additional cost to the Owner.

1.12 WARRANTY AND GUARANTEE

- A. Manufacturer: In addition to the Contractor's and Subcontractor's Guarantee, furnish Owner with manufacturer's available fully executed written warranty against defects in materials and workmanship.
- B. Subcontractor Guarantee: Shall include damage by leaks and settlement of irrigation trenches.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Use materials as specified; any deviation from the Specifications must first be approved by the Owner's Representative in writing.

2.2 DESIGN AND PERFORMANCE CRITERIA

- A. Sustainable Design:
1. VOC emissions for field-applied adhesives, sealants, and sealant primers must comply with limits specified in Section 01 6116.
 2. VOC emissions for field-applied paints and coatings must comply with limits specified in Section 01 6116.

2.3 MATERIALS

- A. Automatic Control Valves: As indicated on Drawings.
- B. Gate Valve: As indicated on Drawings.
- C. Pipe and Fittings:
1. PVC pipe: As indicated on Drawings.
 2. PVC fittings three-inch (3") size and smaller: High impact, standard weight, Schedule 40, molded PVC as manufactured by George Fischer, Lasco, Spears, or approved equal.

IRRIGATION
SECTION 32 8000
3595001

3. PVC fittings four-inch (4") size and larger: High impact, standard weight, Class 200 gasketed, molded PVC as manufactured by George Fischer, Lasco, Spears, or approved equal.
 4. All plastic pipe and fittings: Continuously and permanently marked with manufacturer's name, type of material, IPS size, schedule, NSF approval, and code number.
 5. Threaded PVC pipe and nipples: IPS Schedule 80 when necessary to use threaded connections to gauges, valves, or control valves. Threaded adapters may be used in place of nipples when making pipe to valve connections.
 6. Use 45-degree fittings for changes in depth of pipe, and at transition from main line to automatic control valves.
 7. Piping above ground: Schedule 40 galvanized steel with cast-iron fittings.
- D. PVC Primer: Weld-On P-70 Purple Primer or approved equal.
- E. PVC Glue: Weld-On 711 Gray heavy bodied PVC Cement or approved equal.
- F. Sprinkler Heads: As indicated on Drawings.
- G. Quick Coupler Valves: As indicated on Drawings.
- H. Sleeves: As indicated on Drawings.
- I. All Valve Boxes and Covers: Manufactured, green with "Irrigation – Non-Potable" permanently embossed on cover. Carson, Rainbird or approved equal.
- J. Reduced Pressure Backflow Preventer: As indicated on Drawings.
- K. Automatic Sprinkler Control Wire:
1. Connections between remote control valves and controller: UF-14 direct burial polyethylene (PE) insulated wire, Paige Electric P7079D or approved equal. Common wire to be white, and lead wire to be colored. If multiple controllers are used, a different color is to be used for each controller's lead wire. (Use red for the first controller). Spare wires are to be yellow.
 2. UL Listed waterproof sealing pack for wire connections: 3M DBR/Y-6, or approved equal.
 3. Provide adequate working space around electrical equipment in compliance with local codes and ordinances.
 4. Electrical, other than low voltage, such as power wiring, conduit, fuses, thermal overloads and disconnect switches, is included under Division 26 of these Specifications.
- L. Unions And Flanges:
1. Steel unions and flanges two inches (2") and smaller: 150 lb. screwed black (brass to iron seat) or galvanized malleable iron (ground joint).

2. Steel unions and flanges two and one-half inches (2 ½") and larger: 150 lb. black flange union, flat-faced, full gasket.
 3. Gaskets: One-sixteenth inch (1/16") thick rubber Garlock No. 122, Johns-Manville or approved equal.
 4. Flange Bolts: Open-hearth bolt steel, square heads with cold pressed hexagonal nuts, cadmium plated in ground. Provide copper-plated steel bolts and nuts or brass bolts and nuts for brass flanges.
- M. Sand for Trench Backfill: Natural sand, free of roots, bark, sticks, rags, or other extraneous material

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Prior to commencement of the work of this Section, obtain written verification from the project Civil Engineer that the rough grade in landscape areas is in conformance with Section 31 0000 - Earthwork.
- B. Examine conditions of work in place before beginning work; report defects.

3.2 PREPARATION

- A. Scheduling: Notify the Project Inspector prior to commencing and/or continuing the work of this Section. Remove and replace, at no cost to Owner, any work required as a result of failure to give the appropriate notification.
- B. Measurements: Take field measurements; report variance between plan and field dimensions.
- C. Protection: Maintain warning signs, shoring and barricades as required. Prevent injury to, or defacement of, existing improvements. At no additional cost to Owner, repair or replace items damaged by installation operations.
- D. Existing Tree Protection:
 1. Avoid unnecessary root disturbance, compaction of soils within drip line, or limb breakage.
 2. Do not store material or dispose of any material other than clean water within the drip line.
 3. Provide adequate irrigation during construction.
 4. Replace any tree damaged during construction with a tree of equal size and value at no additional cost to Owner.
 5. Adjust trench locations in field to minimize damage to existing elements and plant roots of trees-to-remain at no additional cost to Owner.

IRRIGATION
SECTION 32 8000
3595001

- E. Surface Preparation: Prior to beginning sprinkler irrigation work, complete placement of topsoil as specified in Section 31 0000 – Earthwork. Notify Project Inspector of irregularities if any.

3.3 AUTOMATIC CONTROLLER

- A. Connect automatic control valves to controller(s) in sequence as shown on Drawings.
- B. Install all exposed wires to a minimum of twenty-four inches (24") beyond controller within a UL approved rigid conduit.

3.4 GRADING

- A. Install all irrigation features to their finished grade and at depths indicated. Complete and /or accommodate all rough grading and/or finish grading before commencing with trenching.

3.5 LAYOUT

- A. Lay out work as accurately as possible to Drawings. Drawings are generally diagrammatic to extent that swing joint offsets and fittings are not shown. Record all changes on the Record Drawings.
- B. Do not willfully install the irrigation system as shown on Drawings when it is obvious, in the field, that obstructions or other discrepancies exist which may not have been considered in the design. Notify Owner's Representative of discrepancies before proceeding.

3.6 EXCAVATING AND TRENCHING

- A. General: Perform excavations as required for installation of work included under this Section, including shoring of earth banks to prevent cave-ins. Restore surfaces, existing underground installations, etc., damaged or cut as result of this work to their original condition and in a manner approved by the Landscape Architect.
- B. Width:
 - 1. Make trenches wide enough to allow a minimum of six inches (6") between parallel pipelines and three inches (3") between side of pipe and side of trench. Do not allow stacking of pipe within trench.
 - 2. Allow a minimum clearance of twelve inches (12") in any direction from parallel pipes of other trades.
- C. Preparation of Excavations: Remove rubbish and rocks from trenches. Bed pipe on a minimum of three inches (3") of clean, rock-free soil to provide a firm, uniform bearing for entire length of pipeline. If clean, rock-free soil is not available, use sand for pipe bedding. See Backfill and Compacting for the remainder of the trench backfill.

- D. Minimum depth of cover: Unless shown otherwise, provide the following minimums:
 - 1. Mainline: twenty-four inches (24") cover.
 - 2. Lateral line: twelve inches (12") cover for spray heads, and eighteen inches (18") cover for rotor heads.
- E. Conflicts with other trades:
 - 1. Hand-excavate trenches where potential conflict with other underground utilities exist.
 - 2. Where other utilities interfere with irrigation trenching and piping work, adjust the trench depth as instructed by Owner's Representative.

3.7 BACKFILL AND COMPACTING

- A. General: Do not begin until hydrostatic tests are completed and when system is operating and after required tests and inspections have been made.
- B. Backfill directly around the pipe: Cover pipe with a minimum of three inches (3") of clean, rock-free soil. If clean, rock-free soil is not available, use sand for three inches (3") of backfill above the pipe. The remainder of the trench backfill material can be native soil or material described below. Do not allow wedging or blocking of pipe.
- C. For backfill of trenches under paving areas:
 - 1. See Section 31 0000 – Earthwork for compaction rates and material
 - 2. See Section 31 2333 – Trenching and Backfilling for trench backfill procedure.
- D. For backfill of trenches in landscape areas:
 - 1. Place backfill in six-inch (6") layers and compact with an acceptable mechanical compactor.
 - 2. Compact backfill material in landscape areas to eighty-five percent (85%) maximum dry density of the soil.
 - 3. If settlement occurs along trenches, make adjustments in pipes, valves, and sprinkler heads, soil, sod or paving as necessary to bring the system, soil, sod or paving to the proper level or the permanent grade, without additional cost to the Owner.
- E. Excess Soil: Remove all rocks, debris, and excess soil that results from sprinkler irrigation trenching operations, landscape planting, and soil preparation operations off site at no additional cost to the Owner. If soil meets topsoil requirements in Section 31 0000 – Earthwork, it may be used for finish grading.
- F. Finishing: Dress-off areas to eliminate construction scars.

**IRRIGATION
SECTION 32 8000
3595001**

3.8 CONTROL WIRES

- A. General: Install control wires beneath sprinkler main line whenever possible; tape wires to mainline pipe. Provide one spare wire for each controller.
- B. Slack Wire: Provide eighteen inches (18") of slack wire for each wire connected to automatic control valve. Slack wire shall be coiled and left in the valve box. Tape wires in bundles every ten feet (10'); do not tape wires in sleeves.
- C. Expansion and Contraction: Snake wire in trench to allow for contraction of wire.
- D. Wire Passing Under Existing or Future Paving or Construction: Encase in PVC Schedule 40 or galvanized steel conduit extending at least twelve inches (12") beyond edges of paving or construction.
- E. Wire Connections: Install wire connections in a waterproof sealing pack.
- F. Wire Splicing: Permit splicing only on runs exceeding 500 feet. Locate all splices within valve boxes.
- G. Wire Termination: Install wire in a valve box with eighteen inches (18") of slack wire coiled and individually capped with approved waterproof sealing pack.
- H. Spare Wire: Install two (2) spare wires along each wire path. If there is more than one wire path from the controller, the contractor to install two (2) spare wires per path. Provide eighteen inches (18") of slack wire at each automatic control valve.

3.9 FLUSHING LINES

- A. Thoroughly flush lines prior to installing valves, performing hydrostatic testing, or installing sprinklers. Divert water to prevent washouts.

3.10 AUTOMATIC CONTROL AND QUICK COUPLER VALVES

- A. Install where shown and where practical; place no closer than twelve inches (12") to walk edges, building walls, or fences. Refer to detail for example.
- B. Thoroughly flush mainline before installing valve.
- C. Install valves in ground cover areas where possible.

3.11 PIPING

- A. General: Install in conformance with reference standards, manufacturer's written directions, as shown on Drawings and as herein specified.
- B. Workmanship:
 - 1. General: Install sprinkler irrigation equipment in planted areas throughout the site.
 - 2. Coordination: Organize location of sleeves with other trades as required.

C. Pipe Line Assembly:

1. General:
 - a. Cutting: Cut pipe square; remove rough edges or burrs.
 - b. Solvent-welded Connections: Use materials and methods recommended by the pipe manufacturer.
 - c. Brushes: Use non-synthetic brushes to apply solvents and primer.
 - d. Cleaning: Clean pipe and fittings of dirt, moisture, and debris prior to applying solvent or primer.
 - e. Assembly: Allow pipe to be assembled and welded on the surface or in the trench.
 - f. Expansion and Contraction: Snake pipe from side to side of trench to allow for expansion and contraction.
 - g. Location: Locate pipes as shown on Drawings except where existing supply valves, utilities or obstructions prohibit or where slight changes are approved to better suit field conditions.
2. Flexible Elastometric Seal Joints:
 - a. General: Assemble in strict conformance with the pipe manufacturer's instruction.
 - b. Rubber Rings: Use rubber rings specific for water service systems.
 - c. Cleaning: Thoroughly clean ring and groove of dirt, moisture and debris using a clean, dry cloth. Do not use solvents, lubricants, cleaning fluids or other material for cleaning.
 - d. Seating: Properly seat ring in groove.
 - e. Spigot:
 - 1) General: Clean spigot-end of pipe as in "Cleaning" above prior to applying lubricant recommended by pipe manufacturer.
 - 2) Seating: Insert spigot into bell and seat to full depth required.
3. Connections:
 - a. Threaded Plastic Pipe Connection:
 - 1) Use Teflon tape or pipe joint compound.
 - 2) When assembling to threaded pipe, take up joint no more than one full turn beyond hand-tight.
 - b. Metal Valves and Plastic Pipe: Use threaded plastic male adapters.
 - c. Metal to Metal Connections:
 - 1) Use specific joint compound or gasket material for type of joint made. Where pipe of dissimilar metals are connected, use dielectric fittings.
 - 2) Where assembling, do not allow more than three full threads to show when joint is made up.
 - d. Where assembling soft metal (brass or copper) or plastic pipe, use strap-type friction wrench only; do not use a metal-jawed wrench.
 - e. Threading:

**IRRIGATION
SECTION 32 8000
3595001**

- 1) Do not permit the use of field-threading of plastic pipe or fittings. Use only factory-formed threads.
 - 2) Use factory-made nipples wherever possible. Permit the use of field-cut threads in metallic pipe only where absolutely necessary. When field-threading, cut threads accurately on axis with sharp dies.
 - 3) Use pipe joint compound for all threaded joints. Apply compound to male thread only.
4. Sleeves and conduits:
- a. Use sleeves of adequate size to accommodate retrieval for repair of wiring or piping and extend a minimum of twelve inches (12") beyond edges of walls or paving.
 - b. Provide removable, non-decaying plug at end of sleeve to prevent entrance of soil.
5. Unions: Locate unions for easy removal of equipment or valve.
6. Capping: Plug or seal opening as lines are installed to prevent entrance materials that would obstruct pipe. Leave in place until removal is necessary for completion of installation.

3.12 SPRINKLER HEADS

- A. Sprinkler heads: Locate as shown on the Drawings except where existing conditions prohibit, or slight changes are approved to achieve as good or better coverage under the same conditions. Do not allow sprinkler head spacing to exceed the maximum shown on the Drawings. Plumb heads.
- B. Handling, Assembly of Pipe, Fittings, and Accessories: Allow only skilled tradesmen to handle and assemble pipe, fittings and equipment. Keep interior of pipes, fittings and accessories clean at all times. Close ends of pipe immediately after installation; leave closure in place until removal is necessary for completion of installation. Do not permit bending of pipe.
- C. Flushing: Remove end heads and operate system at full pressure until all rust, scale, and sand is removed. Divert water to prevent ponding or damage to finished work.
- D. Coverage: Accept responsibility for full and complete coverage of irrigated areas to satisfaction of Landscape Architect and make necessary adjustments to better suit field conditions at no additional costs to Owner.

3.13 FIELD QUALITY CONTROL

- A. Visual Inspection: Verify that all pipe is homogenous throughout and free from visual cracks, holes, or foreign materials. Inspect each length of pipe. All materials are subject to impact test at the discretion of the Landscape Architect.

B. Hydrostatic Tests – Open Trench:

1. Center-load piping with a small amount of backfill to prevent arching or slipping under pressure.
2. Request the presence of the Project Inspector in writing at least forty-eight hours in advance of testing.
3. At no additional cost to Owner, test in the presence of the Project Inspector.
4. Apply continuous static water pressure of 100 psi when welded plastic joints have cured at least twenty-four hours, and with the risers capped, as follows: test main lines and submains for four hours; test lateral lines for two hours.
5. Repair leaks resulting from tests; and repeat tests.
6. Test to determine that all sprinkler heads function according to manufacturer's data and give full coverage according to intent of Drawings. Replace any sprinklers not functioning as specified with ones that do, or otherwise correct system to provide satisfactory performance.

C. Continuity Testing: Test locating device and control wires for continuity prior to and after back-filling operations.

3.14 CLEAN-UP

- A. Remove debris resulting from work of this Section.**

3.15 ADJUSTMENTS AND MAINTENANCE

- A. Adjusting System:** Prior to acceptance, satisfactorily adjust and regulate entire system. Set watering schedule on controller appropriate to types of plants and season of year. Adjust remote control valves to operate sprinkler heads at optimum performance based on pressure and simultaneous demands through supply lines.
- B. System Layout:** Provide reduced prints of Record Document irrigation plans, laminated in four (4) mil. plastic, of size to fit controller door. Enlarge remote-control valve designations as necessary for legibility. Color-code areas covered by each station. Affix plans to inside of controller door.
- C. Instructions:** Upon completion of work, instruct maintenance personnel on operation and maintenance procedures for entire system.
- D. Flow Charts:** Record and prepare an accurate flow-rate chart for each automatic control valve.

3.16 RECORD DRAWINGS

- A. As specified in Section 01 3300, Submittal Procedures, and the following:**
1. Regularly update plans of the system and any changes made to the system throughout the project. Record all changes on this plan before trenches are back-filled.

**IRRIGATION
SECTION 32 8000
3595001**

2. Record complete as-built information and submit the Record Drawings to the Architect before applying for payment for work installed.
3. Show the following on the Record Drawings accurately to scale and dimensioned from two permanent points of reference:
 - a. and spares Distance of mainline from nearby hardscape.
 - b. Location of automatic control valves, quick couplers, and gate valves.
 - c. Location and size of all sleeves.
 - d. Location of automatic control wires.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Soil Preparation and Fertilization
 - 2. Sodding
 - 3. Weed Control
 - 4. Mulch
 - 5. Clean-up
 - 6. Landscape Maintenance Period
- B. Work not included in this Section: Landscape elements such as concrete walks, fencing, outdoor lighting, rough grading, and clearing are not a part of this Section unless shown on the landscape Drawings.

1.2 RELATED REQUIREMENTS

- A. Section 01 8113, Sustainable Design Requirements, for CAL-Green general requirements and procedures.
- B. Section 31 0000, Earthwork.
- C. Section 32 8000, Irrigation

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CALGreen), edition as noted on the drawings, as adopted by the California Division of the State Architect (DSA).
- C. EPA - Federal Insecticide, Fungicide and Rodenticide Act.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Submittal Procedures:
 - 1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
 - 2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.

LANDSCAPING
SECTION 32 9000
3595001

- B. Pre-Installation Meeting: Request and hold a pre-installation meeting prior to beginning the work of this Section. Parties required to be in attendance are the Landscape Contractor, Project Inspector, Owner's Representative, and Landscape Architect.
- C. Pre-scheduled On-site Project Meetings: Hold regularly-scheduled (monthly or bimonthly as determined by the Landscape Architect) on-site project meetings with the Landscape Architect, Project Inspector and Owner's Representative. Dates and times will be jointly agreed upon.

1.5 ACTION SUBMITTALS

- A. Plant Material: Within fifteen (15) days after award of contract, locate plant materials required for construction. Ensure that trees and shrubs are contract- grown from a certified nursery. Notify Owner's Representative of plant material "tied off" for review at selected nursery. If specified material is not obtainable, submit the following to Owner's Representative: proof of non-availability, proposal for use of equivalent material, photographs of alternative choices of plant material. Include clear, written description of type, size, condition, and general character of plant material.
- B. Data Sheets:
 - 1. Provide product data for each type of landscape material indicated in the Drawings and Specifications.
 - 2. Letter from the manufacturer stating that the soil amendment material submitted for use on this project has no metal fragments or foreign objects.
- C. Samples: Submit samples of the following materials to Landscape Architect for approval:
 - 1. Soil amendment: (3) one-quart zip-locked plastic bags.
 - 2. Bark Mulch: (3) one-quart zip-locked plastic bags.
 - 3. Imported Topsoil: (3) one-quart zip-locked plastic bags.
- D. Provide soils analysis reports prepared by a qualified soils laboratory in accordance with the Soils Testing Requirements under "Soil Testing" in Article SOIL TESTING, in Part 3 of this section.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For landscape contractor.
- B. Prior to planting, submit copies of all trucking or packaging tags for all soil amendment, fertilizer and other additives to Landscape Architect so the quantities can be verified.
- C. Record of Pre-Installation Meeting.

1.7 CLOSEOUT SUBMITTALS

- A. Guarantee: Submit Subcontractor's guarantee.
- B. Record Drawings.

1.8 QUALITY ASSURANCE

- A. Qualifications: Work must be completed by a licensed Landscape Contractor. Provide proof of five years of continuous experience in landscaping and irrigation of projects of similar size (+/- 20% of the construction cost) and scope for education campuses. Landscape Contractor to have a minimum of two projects either completed or in construction in the last five years.
- B. Work Force: Ensure that an experienced foreman is present at all times during installation. Keep the same foreman and workers on the job from commencement to completion.
- C. Reviews: Specifically request reviews of all items listed below in Article INSPECTION REQUIREMENTS prior to progressing to the next level of work. The Owner's Representative reserves the right to inspect and reject material, both at place of growth and at site, before and/or after planting, for compliance with requirements for name, variety, size and quality.
- D. Reference Standards: Meet or exceed Federal, State and County laws requiring inspection of all plants and planting materials for plant disease and insect control.

1.9 DELIVERY, STORAGE AND HANDLING

- A. Packaged Materials: Deliver packaged materials in original, unopened containers showing weight, certified analysis, name and address of manufacturer, and indication of conformance with state and federal laws if applicable.
- B. Coordinate a time for the Landscape Architect to inspect the plants upon their delivery to the project site.
- C. Bulk Materials:
 - 1. Do not dump or store bulk materials near structures, utilities, walkways or pavements, or on existing turf areas or plants.
 - 2. Provide erosion-control measures to prevent erosion or displacement of bulk materials, discharge of soil-bearing water runoff, and airborne dust reaching adjacent properties, water conveyance systems, or walkways.
 - 3. Accompany each delivery of bulk fertilizers and soil amendments with appropriate certificates.

LANDSCAPING
SECTION 32 9000
3595001

1.10 FIELD CONDITIONS

- A. Planting Season Limits: Do not plant when grounds are wet or temperature is below 25° F. Do not proceed with any soil preparation and fertilization if all planting cannot be completed within Planting Season Limit.

1.11 INSPECTION REQUIREMENTS

- A. Landscape Architect reserves the right to examine and reject plant material both at place of growth and at site, before and after planting, for compliance with requirements of name, variety, size, and quality.
- B. Obtain verification from Project Inspector for the following at the appropriate times during construction and prior to further progression of work in this Section:
 - 1. Rough grading is to tolerances specified in Section 31 0000 – Earthwork.
 - 2. The placement of landscape backfill material is as specified in this Section.
 - 3. Prior to the commencement of planting operations specified in this Section, the coverage and operation of the sprinkler irrigation system are as specified in Section 32 8000 - IRRIGATION.
 - 4. Required Test: For each load of soil amendment delivered to the site, spread at least two cubic yards (2 cy) of material onto a paved surface approximately two inches (2") deep. Pass a magnetic rake over the material in two directions. If any metal is found, test the entire load in the same manner. Perform all testing in the presence of the Project Inspector.
 - 5. Soil amendments, fertilizer, and materials used for hydroseeding have been delivered to the site by the supplier, the invoices from the supplier indicate the project name and quantities delivered, and the Project Inspector has received copies of all such documents.
 - 6. Prior to planting, amendments and conditioners have been incorporated as per pre-planting recommendations, and planting areas have been made ready to receive planting.
- C. In case of failure to obtain any verification by the Project Inspector as required above, remove and replace work as necessary to obtain the verification at no additional cost to the Owner.

1.12 PROTECTION

- A. Provide protection for persons and property throughout progress of work. Use temporary barricades as required. Proceed with work in such manner as to minimize spread of dust and flying particles and to provide safe working conditions for personnel. Store materials and equipment where directed.
- B. Existing Construction: Execute work in an orderly and careful manner to protect paving, work of other trades, and other improvements.

- C. Existing Utilities: Provide protection for existing utilities within construction area. At no additional cost to Owner, repair any damages to utility lines that occur as a result of this work.
- D. Landscaping: Protect landscape work and materials from damage due to landscape operations, operations by other contractors and trades, and trespassers. Maintain protection during installation and maintenance periods.

1.13 PLANTING SCHEDULE

- A. Install, establish, and maintain all lawn areas for a minimum of ninety (90) days prior to date of substantial completion. Coordinate schedule with other work and overall project schedule. Failure to install lawn areas by this date shall result in assessment of liquidated damages.
- B. Proceed with work in an orderly and timely manner to complete installation of landscaping within contract limits.

1.14 LANDSCAPE MAINTENANCE PERIOD REQUIREMENTS

- A. Beginning of Landscape Maintenance Period:
 - 1. General: Landscape Maintenance Period does not begin until all work is installed and the sod has been placed, as determined by Landscape Architect, in writing.
 - 2. On-site Inspection: When all work is complete, request and hold a meeting to include the Landscape Architect, Project Inspector, Architect and Owner's Representative who must together authorize and determine the start date for the landscape maintenance period. Coordinate and give notice of the date and time of the on-site meeting to all parties at least forty-eight (48) hours in advance.
 - 3. Acceptability: In cases where the lawn has reached adequate fullness and germination in some areas but not all, and authorization has not been given to begin the maintenance period, proceed with mowing, trimming, spraying, etc., as necessary prior to the beginning of the maintenance period.
- B. Duration of Landscape Maintenance Period:
 - 1. The Landscape Maintenance Period shall continue for a minimum of ninety (90) calendar days. During this time, continuously maintain all areas involved until final acceptance of the work by the Owner's Representative. See Landscape Maintenance Period procedure in Article LANDSCAPE MAINTENANCE, in Part 3 of this Section.

1.15 GUARANTEE

- A. The guarantee period for lawn and plant material shall be the duration of the landscape maintenance period, from commencement until final acceptance of the work of this Section.

LANDSCAPING
SECTION 32 9000
3595001

- B. During the guarantee period, repair and/or replace plants and lawn not in satisfactory growing condition, as determined by Owner's Representative, without additional cost to Owner. Plants are to be replaced in accordance with Article LANDSCAPE MAINTENANCE in Part 3 of this Section, using plants of the same kind and size specified in plant list.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Use material in new and perfect condition as specified. Any deviations or substitutions from the Specification and Drawings must first be approved by Owner's Representative in writing prior to use.

2.2 SOIL PREPARATION MATERIALS

- A. Topsoil: Fertile; friable; natural loam surface soil; reasonably free of subsoil, clay lumps, brush, weeds and other litter; and free of roots, stumps, stones/rocks, and other extraneous or toxic matter harmful to plant growth.
- B. Soil Amendment: One-percent nitrogen-impregnated bark product with a ninety-percent (90%) bark base and zero to one-quarter inch (0-1/4") particle size, or approved equivalent. Do not spread until testing requirements have been satisfied.
- C. Fertilizer/Soil Conditioner: Gro-Power Plus or approved equal.

2.3 PLANT MATERIAL:

- A. Lawn Sod: Ninety percent (90%) Dwarf Fescue and ten percent (10%) Kentucky Bluegrass.

PART 3 - EXECUTION

3.1 SITE CONDITIONS

- A. Examine the site, verify grade elevations, and observe conditions under which work is to be performed. Do not proceed with work until unsatisfactory conditions have been corrected in a manner acceptable to the Owner's Representative.
- B. Proceed with complete landscape work as rapidly as portions of the site become available, working within seasonal limitations for each kind of landscape work required.
- C. Determine location of underground utilities and perform work in a manner which will avoid possible damage. Hand-excavate, as required, to minimize possibility of damage to underground utilities. Maintain grade stakes set by others until removal is mutually agreed upon by parties concerned.

- D. When conditions detrimental to sod or plant growth are encountered, such as rubble fill, adverse drainage condition, or other obstructions, notify the Owner's Representative before planting.

3.2 SOIL TESTING

- A. Coordinate soil testing in an expeditious and timely manner as required for on-site topsoil materials. Contract with a soil laboratory and include cost of sampling and testing in contract price. Take one (1) sample for every 5,000 square feet of landscape area up to a maximum of six (6) samples under the direction of and in the presence of the Owner's Representative.
- B. Submit each sample, according to the quantity of soil required by testing laboratory, to a competent laboratory approved by the Owner's Representative.
- C. Provide analysis of soil samples for pH, salinity, ammonia, phosphate, potassium, calcium, magnesium, boron, and sodium levels. Provide appraisal of chemical properties, including particle size determination, and recommendations for types and quantities of amendments and fertilizers.

3.3 PREPARATION

- A. Clearing of Vegetation:
 - 1. If live perennial weeds exist on site at the beginning of work, spray with a non-selective systemic contact herbicide as recommended and applied by an approved licensed landscape pest control advisor and applicator. Leave sprayed plants intact for at least 15 days.
 - 2. Clear and remove existing weeds by mowing or grubbing off all plant parts at least one-quarter inch (1/4") inch below surface of soil over entire areas to be planted.
- B. Soil preparation:
 - 1. Loosen soil in all planting areas, and on slopes flatter than 3:1 gradient, to a depth of six to eight inches (6" - 8") below finish grade. All debris, foreign matter, and stones shall be removed prior to the placing of any fertilizers or conditioners. Soil preparation is for all shrub planting beds, lawn hydroseeded areas and sodded lawn areas.
 - 2. Conduct the required soil tests and instruct the lab to include a minimum of the following soil improvements in the recommendation on the soils report.
 - a. Soil Amendment: Two cubic yards (2 cy) per 1,000 square feet.
 - b. Gro-Power Plus: One hundred fifty pounds (150 lbs) per 1,000 square feet.
 - c. If the lab recommends less than six cubic yards (6 cy) of soil amendment, the excess bid amount shall be applied to the cost of any additional recommended soil improvements, or returned to the Owner as a credit

LANDSCAPING
SECTION 32 9000
3595001

3. Apply amendments as follows, using rates recommended by the soils testing laboratory (the rates of amendments shown below are for bidding purposes only):
 - a. Fertilizer/Soil Conditioner: Broadcast 150 pounds of Gro Power Plus per 1,000 square feet in all planting areas and rototill to a depth of six to eight inches (6" - 8"). Remove from the site any rock and debris brought to the surface by cultivations. "Cultipack" all areas to receive sod or hydroseed.
 - b. Apply soil amendment to all planting areas at the rate of six cubic yards (6 cy) per 1,000 sf and rototill into the top six to eight inches (6" - 8").
4. Upon completion of finish grading, request an review and obtain approval of Landscape Architect prior to commencement of planting or hydroseeding.

C. Finish Grading for all Planting areas

1. Refer to Earthwork Specification Section for Rough Grading.
2. Grade to elevations and contours shown on Drawings. Fill low spots with landscape backfill material and grade to surface drain in manner indicated on Drawings.
3. Finish-grade so that the entire area within the contract lines has a natural and pleasing appearance as specified and as directed by Landscape Architect.
4. Adjust sprinkler heads flush to finish grade in preparation to receive hydroseeding or one-half inch above finish grade in preparation to receive sod. Reset sprinkler heads flush to grade after turf has germinated.
5. Flag the sprinkler heads and valve markers.

3.4 PLANTING

A. Lawn Sod:

1. Cultivate all lawn areas to a depth of six inches (6"). If cultivation does not break lumps, pull a spike-toothed harrow over the area behind the tractor.
2. Give all lawn areas that are to be sodded a smooth finish to prevent pockets. Do not allow any abrupt changes of surface. Prior to installation of sod, roll the grade with a 200-pound water-ballast roller. Request that the lawn grade be inspected and approved by the Landscape Architect prior to sodding to determine its suitability for planting. Obtain such approval prior to commencing sodding operations.
3. Do not take heavy objects (except lawn rollers) over lawn areas after they have been prepared for planting.
4. Completely lay the sod within twelve hours (12 hrs) of delivery. Do not leave sod on pallets in the hot sun longer than necessary.
5. Unroll sod carefully. Lay sod tight without any visible open joints, and without overlapping; stagger end joints twelve inches (12") minimum. Do not stretch or overlap sod pieces. Do not place sod in pieces smaller than twenty-four inches (24") in length by width of roll.

6. When new sod is to match existing turf, cut the edge of the existing turf in a series of straight lines that will accept new sod rolls in full width of the sod roll. Make the transition of grade between existing turf and new sod to be seamless with no change in elevation.
7. Immediately after laying sod, roll lawn areas with a 200-pound water-ballast roller.
8. Trim sod to conform to lawn shapes designated in Drawings.
9. On slopes of six inches (6") per foot and steeper, lay sod perpendicular to slope and secure every row with wooden pegs at a maximum of two feet (2') on center. Drive pegs flush with soil portion of sod.
10. Ensure that finished appearance is that of one continuous lawn.
11. Do not lay whole lawn before watering. When a conveniently large area has been sodded, water lightly to prevent drying. Continue to lay sod and to water until installation is complete.
12. All sod areas must be approved by Landscape Architect.
13. Water the complete lawn surface thoroughly. Moisten soil at least eight inches (8") deep. Repeat sprinkling at regular intervals to keep sod moist at all times until rooted. After sod is established, decrease frequency and increase amount of water per application as necessary.

3.5 CLEAN-UP

- A. During construction, keep the site free of rubbish and debris, and clean up the site promptly when notified to do so. Take care to prevent spillage on streets from hauling and immediately clean up any such spillage and/or debris deposited on streets due to the work of this Section.
- B. During all phases of the construction work, take all precautions to abate dust nuisance by clean-up, sweeping, sprinkling with water, or other means as necessary.
- C. Paving: Maintain cleanliness of paving areas and other public areas used by equipment, and immediately remove spillage; remove rubbish, debris, and other material resulting from landscaping work, leaving site in a safe and clean condition.

3.6 LANDSCAPE MAINTENANCE

- A. The Landscape Maintenance Period will begin when all the Landscape Maintenance Period Requirements have been met (See Part 1 of these Specifications).
- B. Cleaning: Maintain cleanliness on paving areas and other public areas used by equipment and immediately remove all spillage. Remove from project site all rubbish and debris found thereon and all material and debris resulting from landscaping work, leaving the site in a safe and clean condition.

**LANDSCAPING
SECTION 32 9000
3595001**

C. Maintenance:

1. Sprinkler Irrigation System:

- a. Check system weekly for proper operation. Flush lateral lines out after removing last sprinkler head or two at each end of lateral. Adjust all heads as necessary for unimpeded coverage.
- b. Set and program automatic controllers for seasonal water requirements. Provide the Owner's Representative with keys to the controllers and instructions on how to turn off system in case of emergency.
- c. Repair all damages to sprinkler irrigation system as part of the contract work. Make repairs within one watering period or one week, whichever is the least amount of time.

2. Turf Areas:

- a. Begin mowing turf when grass has reached a height of three inches (3") and cut to a height of one-half inches to two inches (1 ½" - 2"). Mow at least weekly after the first cut. Turf must be well-established and free of bare spots and weeds, to satisfaction of Landscape Architect, prior to final acceptance. Do not mow lawns when the soil is not able to support maintenance equipment. Repair wheel marks and ruts caused by the maintenance equipment at no additional cost to the Owner.
- b. Pick up grass clippings and remove from the site and premises.
- c. Trim edges at least twice monthly for neat appearance. Vacuum or blow clippings off walks.
- d. Water the lawns at such frequency as weather conditions require to replenish soil moisture below the root zone. Normally, a total of one and one-half inches (1 ½") of water is needed weekly in hot weather.
- e. Fertilize the lawn areas at the beginning of the Landscape Maintenance Period and at the completion of the Landscape Maintenance Period. Use a fertilizer with the following characteristics:
 - 1) Slow release, Best 16-6-8, or approved equal, at the rate of 6.25 lbs per 1,000 square feet from March through October.
 - 2) Calcium Nitrate (15-0-0) at the rate of 6.5 lbs per 1,000 square feet from November through February.
- f. Broadcast fertilizer using a mechanical spreader; do not apply by hand-broadcasting. Sweep all fertilizer off hardscape into adjacent planters.
- g. Weekly as needed and as directed, re-sod lawn areas with material that matches previously installed material. Use sod to repair any bare areas. Repair areas to receive sod as follows:
 - 1) Mark out areas to receive new sod repair.
 - 2) Cut straight lines that will accept sod the full width of the roll and a minimum of twenty-four inches (24") in length.

- 3) Transition the grade between existing turf and new sod seamlessly, with no change in elevation.
- 3. Insecticide and Herbicide Application:
 - a. If needed, control weeds with selective herbicides and sprays. In areas where crabgrass has infested the lawn, apply pre-emergent herbicides such as Dacthal by Amvac, Balan, or Betasan by Gowan for control prior to crabgrass germination. Control insect pests if necessary.
 - b. Use only a licensed Pest Control Operator to apply herbicides and sprays and to maintain a log for applications indicating material, timing, and rate.
- D. Final Acceptance of the Landscape Maintenance Period: request on-site meeting forty-eight hours (48 hrs.) in advance with the Landscape Architect and Owner's Representative to determine the end of the Landscape Maintenance Period.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Domestic water piping system.
 - 2. Fire protection piping systems.
 - 3. Sewer piping system

1.2 RELATED REQUIREMENTS

- A. Section 01 5000, Temporary Facilities and Controls.
- B. Section 01 6116, Volatile Organic Compound (VOC) Restrictions, for VOC limits pertaining to adhesives, sealants, fillers, primers, and coatings.
- C. Section 01 8113, Sustainable Design Requirements, for CAL-Green [and Collaborative for High Performance Schools (CHPS)] general requirements and procedures.
- D. Section 31 0000, Earthwork.
- E. Section 31 2333, Trenching and Backfilling.
- F. Section 32 1600, Site Concrete.

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CAL Green), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- C. California Plumbing Code, (CPC), edition as noted on the Drawings.
- D. California State Health and Safety Code Section 116875, Lead Free Public Water Systems.
- E. Local Jurisdiction: Any work within the street, highway or right-of-way shall be performed in accordance with the requirement of the governmental agencies having jurisdiction, and shall not begin until all of those governing authorities have been notified.
- F. ASTM International (ASTM):
 - 1. D422-63: Test Method for Particle Size Analysis of Soil.
 - 2. D698-00: Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures, Using 5.5 lb (2.49 Kg) Rammer and 12 inch (304.8 mm) Drop.
 - 3. D1556-00: Test Method for Density of Soil in Place by the Sand-Cone Method.
 - 4. D1557-02: Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 10 lb. (4.54 Kg) Rammer and 18 inch (457 mm) Drop.

- 5. D3017-05: Test Methods for Moisture Content of Soils and Soil-Aggregate Mixture by Nuclear Methods (Shallow Depth).
- 6. D4318-05: Test Method for Liquid Limit, Plastic Limit, and Plasticity Limit.
- G. CALTRANS Standard Specifications.
- H. CAL-OSHA, Title 8, Section 1590 (e).
- I. NFPA 13, 24 and 25, per CFC chapter 80 and CBC chapter 35.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Submittal Procedures:
 - 1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
 - 2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
 - 3. Sustainable Design Submittals shall comply with the additional requirements of Section 01 8113, Sustainable Design Requirements.

1.5 ACTION SUBMITTALS

- A. Provide supplier's descriptive literature for all products to demonstrate compliance with specified attributes.
- B. Substitution: Provide all data of proposed material being submitted as a substitution. Provide comparison with specified product data and identify all differences. Failure to provide comparison will be reason for rejection.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For contractor / installer.
- B. Provide sieve analysis from accredited testing lab on pipe bedding material. Analysis shall have a current date not older than project contract signing date.
- C. Sustainable Design:
 - 1. General:
 - a. Submit information necessary to establish and document compliance with the California Green Building Standards Code.
 - b. Sustainable design submittals are in addition to other submittals.
 - 2. The following information shall be provided:
 - a. Adhesives and Sealants: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.
 - b. Paints and Coatings: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.

1.7 CLOSEOUT SUBMITTALS

- A. Guarantee: Submit subcontractor's guarantee.
- B. Water Sterilization Test Report.

1.8 QUALITY ASSURANCE

- A. Contractor / Installer shall have been in business for five (5) years providing/finishing similar size projects and complexity.
- B. Contractor shall be solely responsible for all subgrades built. Any repairs resulting from inadequate compaction or incorrect grades will be the responsibility of the contractor.
- C. The representatives of the Owner's testing lab will not act as supervisor of construction, nor will they direct construction operations. Neither the presence of the Owner's testing lab representatives nor the testing by the Owner's testing lab shall excuse the contractors or subcontractors for defects or deficiencies discovered in their work during or following completion of the project. Correcting inadequate compaction is the sole responsibility of the contractor.
- D. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the drawings to be salvaged and re-used.
 - 1. Sun damaged or discolored PVC pipe will be rejected.
- E. All materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.

1.9 FEES, PERMITS, AND UTILITY SERVICES

- A. Obtain and pay for permits and service charges required for installation of Work. Arrange for required inspections and secure written approvals from authorities having jurisdiction.
- B. Upon completion of work within right-of-way, provide copies of written final approval to the Architect.

1.10 DELIVERY, STORAGE AND HANDLING

- A. Transport, store and handle in strict accord with the local jurisdiction and manufacturer's written recommendations
- B. Deliver undamaged products to job in manufacturer's sealed containers and/or original bundles with tags and labels intact.

1.11 EXISTING SITE CONDITIONS

- A. Contractor shall acquaint himself with all site conditions. If unknown active utilities are encountered during work, notify Architect promptly for instructions. Failure to notify will make Contractor liable for damage to these utilities arising from Contractor's operations subsequent to discovery of such unknown active utilities.
- B. Existing civil, mechanical and electrical improvements are shown on respective site plans to the extent known. Should the Contractor encounter any deviation between actual conditions and those shown, he is to immediately notify the Architect before continuing work.

1.12 PROTECTION

- A. Adequate protection measures shall be provided to protect workmen and passers-by on and off the site. Adjacent property shall be fully protected throughout the operations. Blasting will not be permitted. Prevent damage to adjoining improvements and properties both above and below grade. Restore such improvements to original condition should damage occur. Replace trees and shrubs outside building area disturbed by operations.
- B. In accordance with generally accepted construction practices, the Contractor shall be solely and completely responsible for working conditions at the job site, including safety of all persons and property during performance of the work. This requirement shall apply continuously and shall not be limited to normal working hours.
- C. Any construction review of the Contractor's performance conducted by the Geotechnical Engineer is not intended to include review of the adequacy of the Contractor's safety measures, in, on, or near the construction site.
- D. Provide shoring, sheeting, sheet piles and or bracing to prevent caving, erosion or gullyng of sides of excavation.
- E. Surface Drainage: Provide for surface drainage during period of construction in manner to avoid creating nuisance to adjacent areas. The contractor shall make a reasonable effort on a daily basis to provide pumps and all equipment necessary to keep all excavations and the site free from water during entire progress of work, regardless of cause, source, or nature of water.
- F. Adjacent streets and sidewalks shall be kept free of mud, dirt or similar nuisances resulting from earthwork operations.
- G. The site and adjacent influenced areas shall be watered as required to suppress dust nuisance. Dust control measures shall be in accordance with the local jurisdiction.
- H. Trees: Carefully protect existing trees that are to remain. Provide temporary irrigation as necessary to maintain health of trees.

1.13 SEASONAL LIMITS

- A. No fill material shall be placed, spread or rolled during unfavorable weather conditions. When work is interrupted by rains, fill operations shall not be resumed until field tests indicate that moisture content and density of fill are satisfactory.

1.14 RECORD DRAWINGS

- A. Keep a daily record of all pipe placed in ground, verified by Project Inspector.
- B. Upon completion of this Contract, furnish one tracing showing all outside utility lines, piping, etc., installed under this Contract. Locate and dimension all work with reference to permanent landmarks.
- C. All symbols and designations used in preparing "RECORD" drawings shall match those used in Contract drawings.
- D. Properly identify on as-builts and provide dimensions for all stubs for future connections. Provide concrete markers 6" dia. 12" deep, flush with finish grade at the ends of all stubbed pipes.

- E. Provide record drawings per Section 01 3300.

PART 2 - PRODUCTS

2.1 DESIGN AND PERFORMANCE CRITERIA

- A. Sustainable Design:
 - 1. VOC emissions for field-applied adhesives, sealants, and sealant primers must comply with limits specified in Section 01 6116.
 - 2. VOC emissions for field-applied paints and coatings must comply with limits specified in Section 01 6116.

2.2 MATERIALS - GENERAL

- A. Provide each item listed herein or shown on drawings of quality noted or approved equal. All material shall be new, full weight, standard in all respects and in first-class condition. Insofar as possible, all materials used shall be of same brand or manufacture throughout for each class of material or equipment. Materials shall be of domestic manufacture and shall be tested within Continental United States.
- B. Grade or quality of materials desired is indicated by trade names or catalog numbers stated herein.
- C. Dimensions, sizes, and capacities shown are minimum and shall not be changed without permission of Architect.
- D. All materials in this section used for any public water system or domestic water for human consumption shall be lead free.
 - 1. For the purposes of this section, "lead free" means not more than 0.2 percent lead when used with respect to solder and flux and not more than 8 percent when used with respect to pipes and pipe fittings.
 - 2. All pipe, pipe or plumbing fitting or fixtures, solder, or flux shall be certified by an independent American National Standards Institute (ANSI) accredited third party, including, but not limited to, NSF International, as being in compliance with this section.
- E. All materials used for fire system piping shall be UL and FM approved.

2.3 VALVE BOXES

- A. Provide at each valve or cock in ground a Christy, Brooks, or equal to Christy G05CT, concrete valve box with cover marked for service, domestic water shall be marked "Water" and fire supply shall be marked "Fire". Furnish extension handles for each size square nut valve, and provide "fork" handle for each size of "wheel handle" valve as required. Do not locate valve boxes in walk, or covered passages, curbs, or curb & gutters, unless necessary. If valve location is within concrete or asphalt paved surface valve box shall be as detailed on plans for such condition. Provide valve box extensions as required to set bottom of valve box to bottom of piping in which valve is installed. Provide Owner with set of special wrenches and/or tools as required for operation of valves.

2.4 PIPES AND FITTINGS

- A. Sanitary Sewer: PVC sewer pipe and fittings with Ring-Tite joints, ASTM D3034 SDR35.
- B. Domestic water Lines 3 1/2" and smaller: Type K copper tubing, hard temper, with wrought copper fittings. Schedule 80 PVC, ASTM D 1784, ASTM D 1785.
- C. Water lines 4" and larger: AWWA C-900 Class 150/DR18 with rubber gasket joints.
- D. Fire lines 4" and larger: AWWA C-900 Class 200/DR14 with rubber gasket joints.
- E. Solder: Lead Free. 95/5; 95% Tin / 5% Antimony.
- F. Ductile Iron Pipe; AWWA Class 51, Cement Lined
- G. Ductile Iron Pipe Fittings; AWWA C110, C153, Ebba Iron, Star Romac, Sigma, or approved equal.
- H. PVC Mechanical Fittings; Ebba Iron, Star; Romac; Sigma or approved equal.
- I. Ductile Iron Pipe/PVC C-900 Pipe Restrained Fittings; Ebba Iron # 3800 Mega Coupling, Ebba Iron 1100CH Split Restrained Harness for pipe couplings. StarGrip Series 4000.
- J. Ductile Iron Pipe/PVC C900, C905 Restrained Degreedand Blind Cap Fittings,;
- K. Mega Lug; Sigma; Romac; or an approved equal
- L. Mechanical Fitting Bolts; Bolts and nuts shall be carbon steel with a minimum 60,000 psi tensile strength conforming to ASTM A 307, Grade A. Bolts shall be standard ANSI B1.1 Class 2A course threads. Nuts shall conform to ASTM A 563 and be standard ANSI B1.1, Class 2A course thread. All bolts and nuts shall be zinc coated.
- M. Fasteners Anti-Rust Coatings; After assembly, coat all fasteners with an Asphaltic Bituminous coatings conforming to latest edition NFPA 24.
- N. Ductile Iron Pipe Wrap; 8 mil polyethylene pipe wrap conforming to ANSI/AWWA C105/A21.5 standards.
- O. Pipe Insulation; Pipe exposed to atmospheric conditions 1/2" thru 4" NPT; Johns Manville rigid fiberglass insulation, Micro Lok HP; Owens Corning Fiberglas SSL II; Conforming to ASTM C 612, Type 1A or type 1B.
- P. Aluminum field applied pipe insulation jacket; comply with ASTM B209, ASTM C1729, ASTM C1371 Manufacturers; Childers Metals; ITW Insulation Systems Aluminum Jacketing; or an approved equal.
 - 1. Finish shall be flat mill finish
 - 2. Factory Fabricated Fitting Covers; 45 and 90 degree elbows, tee's, valve covers, end caps, unions, shall be of the same thickness and finish of jacket.
 - 3. The fittings shall be composed of 2-pieces
 - 4. Adhesives; per the manufacturers requirements
 - 5. Joint Sealant; shall be silicone, and shall be aluminum in color.
- Q. Sewer Forced Main; HDPE, DR 11, color gray with green stripe by JM Eagle or approved equal.

2.5 SANITARY SEWER MANHOLES

- A. Shall be constructed as shown on plan details.

2.6 CLEANOUTS

- A. Cleanouts of same diameter as pipe up to 8" in size shall be installed in all horizontal soil and waste lines where indicated and at all points of change in direction. Cleanouts shall be located not less than 18" from building so as to provide sufficient space for rodding. No horizontal run over 100 feet shall be without cleanout whether shown on drawings or not.
- B. All cleanout boxes shall be traffic rated with labeled lid, Christy G05CT or approved equal. Lid shall be vandal proof with stainless steel screws

2.7 UNIONS

- A. Furnish and install one union at each threaded or soldered connection to equipment and 2 unions, one on each side of valves on pipes ½" to 3".
- B. Locate unions so that piping can be easily disconnected for removal of equipment or valve. Provide type specified in following schedule:

Type of Pipe Union

Steel Pipe:	150 lb. Screwed malleable ground joint, brass, brass-to-iron seat, black or galvanized to match pipe.
Copper tubing:	Brass ground joint with sweat connections.
PVC Sch 80 pipe:	PVC union, FIPT X FIPT

2.8 VALVES

- A. Provide valves as shown and other valves necessary to segregate branches or units. Furnish valves suitable for service intended. Valves shall be properly packed and lubricated. Valves shall be non-rising stem. Place unions adjacent to each threaded or sweat fitting valve. Install valves with bonnets vertical. All valves shall be lead free.
- B. Valves ½" thru 2"; shall be made of bronze, full size of pipe and lead free. Nibco S-113-FL Series; American G-300 Series; Matco 511 FL Series; Apollo 102T-FL Series. Brass valves of brass parts within valves will not be accepted.
- C. Valves, 2 ½" thru 3" shall be class 150; Shall be made of bronze, full size of pipe; Jenkins Fig. 2310 J; Lunkinheimer Fig. 2153; Crane Fig. 437; Stockham Fig. B-128.
- D. Valves, Flanged; 4" thru 12" Ductile Iron Resilient Wedge Gate Valve; Nibco F 609 RW; American 2500 Series; Kennedy 8561; Mueller 2360 Series.

2.9 TAPPING SLEEVE

- A. Shall be used on pipe sizes 6" thru 12" and shall be made with stainless steel material including stainless steel bolts. Flanges shall be ductile iron or high carbon steel. Gaskets shall seal full circumference of pipe. Shall be manufactured for operating

pressure of 200 psi, and shall pass test pressure of 300 psi. Romac SST series; Smithblair 662; Mueller H304; Ford "FAST" tapping sleeve.

2.10 SERVICE SADDLES

- A. Shall be used on pipe size 2" thru 4". Body shall be made from ductile iron with epoxy coating or bronze. Cascade Style CSC-1; A.Y. McDonald model 3891 AWWA/3892 FNPT; Smith-Blair #317; Ford S70, S71, S90, (style B).

2.11 TRACER WIRE

- A. No. 10 THW solid copper wire. Solder all joints

PART 3 - EXECUTION

3.1 DRAWINGS AND COORDINATION

- A. General arrangement and location of piping, etc., are shown on Drawings or herein specified. Install work in accord therewith, except for minor changes that may be necessary on account of other work or existing conditions. Before excavation, carefully examine other work that may conflict with this work. Install this work in harmony with other craft and at proper time to avoid delay of work.
- B. Verify invert elevations at points of connection to existing systems prior to any excavation. If invert elevations differ from that shown on drawings, notify Architect immediately.
- C. In advance of construction, work out minor changes if conflicts occur with electrical or mechanical. Relocate services to suit actual conditions and work of other trades to avoid conflict therewith. Any adjustments or additional fittings to make adjustments shall not be cause for additional costs to the owner.
- D. Execute any work or apparatus shown on drawings and not mentioned in specifications, or vice versa. Omission from Drawings or Specifications of any minor details of construction, installation, materials, or essential specialties does not relieve Contractor of furnishing same in place complete.
- E. Graded pipes shall take precedence. If conflict should occur while placing the domestic water and fire service piping, the contractor shall provide any and all fittings necessary to route the water lines over such conflicting pipes at no additional costs to the owner.

3.2 ACCESS

- A. Continuously check for clearance and accessibility of equipment or materials specified herein to be placed. No allowance of any kind shall be made for negligence on part of Contractor to foresee means of installing his equipment or materials into proper position.

3.3 EXCAVATING AND BACKFILLING

- A. Excavation and Bedding:
 - 1. General: Trench straight and true to line and grade with bottom smooth and free of irregularities or rock points. Trench width to be a minimum of 12" wider than

outside diameter of pipe. Follow manufacturer's recommendations for use of each kind and type of pipe.

2. Bedding: Provide a bedding as noted on drawing details for the full length of the pipe. Bedding shall have a minimum thickness beneath the pipe of 4" or 1/8 the outside diameter of the pipe, whichever is greater. Provide bell holes and depressions for pipe joints only of size required to properly make joint.
3. If the trenches for the site utilities falls within areas to be lime treated, the piping shall be installed prior to any lime treatment operations, providing the elevation of the piping is below the treatment section.
 - a. If trenching is necessary in areas that have been previously lime treated the contractor shall backfill the trench with class 2 aggregate base, with minimum section equal to the lime treated section and compacted to 95%.

B. Laying of Pipe:

1. General: Inspect pipe prior to placing. Sun damaged pipe will be rejected. Set aside any defective or damaged material. Do not place pipe in water nor place pipe when trenches or weather are unsuitable. Lay pipe bell up grade, true to line and grade.
 - a. Sewer pipe shall be laid in strict conformity to the prescribed line and grade, with grade bars set and each pipe length checked to the grade line. Three consecutive points on the same rate of slope shall be used at all times to detect any variation from a straight grade. In any case of discrepancy, work shall be stopped and the discrepancy immediately reported to the Owner's Representatives. In addition, when requested by the Owner's Representative, a string line shall be used in the bottom of the trench to insure a straight alignment of the sewer pipe between manholes. The maximum deviation from grade shall not be in excess of 1/4 inch. In returning the pipe to grade, no more than 1/4" depression shall result.
 - b. The Contractor shall expose the end of existing pipe to be extended, for verification of alignment and elevation, prior to trenching for any pipe which may be affected. All costs of such excavation and backfill shall be included in the price paid for the various items of work.
 - c. A temporary plug, mechanical type shall be installed on sewer pipe at the point of connection to existing facilities. If connecting to a public facility the plug shall conform to the requirements of the local jurisdiction. This plug shall remain in place until the completion of the balling and flushing operation.
2. Bell and Spigot Joints: Lubricate inside of bells and outside of spigots with soap solution. Wedge joints tight. Bell of bell and spigot pipe to be pointed up grade.

C. Backfilling:

1. General: Do not start backfill operations until required testing has been accomplished.
2. Compaction and Grading: Remainder of backfill shall be in accordance with Section 31 2333 – TRENCHING AND BACKFILLING.
3. If trenching in area previously lime or cement treated backfill top of trench section, same depth as lime or cement treatment with Class 2 Aggregate Base compacted to 95% minimum relative compaction.

3.4 INSTALLATION OF WATER PIPING

- A. Immediately cap or plug ends of, and opening in, pipe and fittings to exclude dirt until final connections made. Use reducing fittings where any change in pipe size occurs. Bushings shall not be used.
- B. General: Should existing conditions or other work prevent the running of pipes or the setting of equipment at the points indicated by drawings, changes as authorized by the Architect shall be made without additional cost to the Owner.
- C. All bolts used on mechanical fittings shall be thoroughly coated with an asphaltic bituminous coating conforming to 2007 NFPA (National Fire Protection Association) 10.3.5.2 and 10.8.3.5, CBC chapter 35 and CFC chapter 80.
- D. All buried metal shall be incased with 8 mil polyethylene wrap so that no soil is in contact with metal. Ends of polyethylene wrap shall be taped to provide seal with pipe.
- E. Do not install water lines in same trench with non-metallic sewer lines unless bottom of water pipe at all points is at least 12" above top of sewer line and water line is placed on solid shelf excavated at one side of common trench with a minimum of 12 inch horizontal separation.
- F. Under no circumstance shall a fitting be located directly under a structural footing without prior approval from the Architect.
- G. In locations where existing domestic pipe is rerouted, the new pipe shall be assembled using restrained fittings at all joints including factory pipe joints. Tapped restrained blind flanges shall be temporarily installed at each end of the assembled pipes until testing and chlorination is completed and approved.

3.5 CLOSING IN OF UNINSPECTED WORK

- A. Do not allow or cause work installed to be covered up or enclosed before it has been inspected, tested, and approved. Should work be enclosed or covered up before it has been approved, uncover work at own expense. After it has been inspected, tested and approved, make repairs necessary to restore work of other contractors to condition in which it was found at time of cutting.

3.6 CARE AND CLEANING

- A. Repair or replace broken, damaged, or otherwise defective parts, materials, and work. Leave entire work in new condition satisfactory to Architect. At completion, carefully clean and adjust equipment, fixtures and trim that are installed as part of this work. Leave systems and equipment in satisfactory new operating condition.
- B. Drain and flush piping to remove grease and foreign matter.
- C. Sewer piping shall be balled and flushed.
- D. Clean out and remove surplus materials and debris resulting from the work, including surplus excavated material.
- E. Flush fire service piping in the presence of the project inspector. Flushing shall be continued for a sufficient time as necessary to ensure all foreign material has been removed. Flow rate shall be equal to site fire flow requirements.

3.7 SEWER INTERNAL INSPECTIONS

- A. Upon completion of construction and prior to final inspection, the Contractor shall clean the entire new pipeline of all dirt and debris. Any dirt or debris in previously existing pipes or ditches in the area, which resulted from the new installation, shall also be removed. Pipes shall be cleaned by the controlled balling and flushing method. Temporary plugs shall be installed and maintained during cleaning operations at points of connection to existing facilities to prevent water, dirt, and debris from entering the existing facility.

3.8 TEST OF PIPING

- A. Pressure Test piping at completion of roughing-in, in accord with following schedule, and show no loss in pressure or visible leaks after minimum duration or four (4) hours at test pressures indicated.
- B. Chlorination tests shall be performed after all fixtures and any required mechanical devices are installed and the entire system is complete and closed up.
- C. In cases where new domestic water piping is assembled for re-routing of existing domestic water pipe, the contractor shall perform the following testing prior to connecting the new water pipe to the existing system.
 - 1. The pipe shall be pressure tested and per the test schedule.
 - 2. The pipe shall be pressure tested down within the trench.
 - 3. The contractor shall dig a temporary ditch below the existing pipe to drain to a sump that is lower than the bottom of the trench and to the side of the trench. The sump shall be 30% larger than the total volume of water within the testing pipe assembly.
 - 4. After pressure testing and chlorination has taken place and accepted, the contractor shall drain the pipe into the sump and pump the sump out as it is filling.
 - 5. The temporary test fittings at each end of the pipe assembly shall be removed and the final restrained couplings installed.
 - 6. The existing piping shall be cut and the water within the pipe shall drain below the pipe to the temporary sump. Pump the sump as it is being filled up. Take extreme caution not to contaminate the existing pipe with any contaminants within the trench.
 - 7. Before making the final coupling connections, the restrained couplings at each end of the new pipe shall be thoroughly swabbed inside the fitting with a solution of chlorine mixed with water at a rate of 1 part chlorine to 4 parts potable water.
 - 8. After final connections are made, a visual inspection shall be made after fittings are wiped off. If after 1 hr, no noticeable drips are noted the pipe can be backfilled.
 - 9. The contractor shall flush all water piping affected by chlorination until it is within acceptable levels approved by certified testing lab.

TEST SCHEDULE

System Tested

Public Water Mains

Test Pressure PSIG Test With

Per local jurisdiction requirements.

Private Domestic Water Piping:	150 Lbs. Water 4 hrs.
Fire Protection Piping:	200 Lbs. Water pressure, 4 hrs duration with no pressure loss.
Sanitary Sewer Piping:	Sewer system shall be tested for leakage per local jurisdiction requirements.

- D. Testing equipment, materials, and labor shall be furnished by contractor.

3.9 WATER SYSTEM STERILIZATION

- A. Public Water Mains: Shall be flushed and disinfected per the local jurisdiction requirements
- B. Clean and disinfect all site water systems connected to the domestic water systems in accordance with AWWA Standard C651 and as required by the local Building and Health Department Codes, and EPA.
1. Clean and disinfect industrial water system in addition to the domestic water system.
 2. Disinfect existing piping systems as required to provide continuous disinfection upstream to existing valves. At Contractors option, valves may be provided to isolate the existing piping system from the new piping system.
- C. Domestic water sterilization shall be performed by a licensed "qualified applicator" as required by CAL-EPA Pesticide Enforcement Branch for disinfecting and sterilizing drinking water.
- D. Disinfecting Agent: Chlorine product that is a registered product with Cal-EPA for use in California potable water lines, such as Bacticide, CAL-EPA Registration No. 37982-20001.
- E. Contractor to provide a 1" service valve connected to the system at a point within 2'-0" of its junction with the water supply line. After sterilization is complete Contractor to provide cap at valve.
- F. Sterilization Procedure to be as follows:
1. Flush pipe system by opening all outlets and letting water flow through the system until clear water flows from all outlets.
 2. Inject disinfecting agent to provide a minimum chlorine residual concentration of at least 50 parts per million (ppm) of free chlorine at each outlet.
 3. Provide sign at all outlets which reads "Water Sterilization in Progress – Do not operate". Remove signs at conclusion of test.
 4. Close all outlets and valves, including valve connecting to water supply line and 1" service valve. Retain treated water in pipe for a minimum of twenty-four hours. Should chlorine residual at pipe extremities be less than 50 PPM at this time, pipe shall be re-chlorinated. As an option, the water systems may be filled with a water-chlorine solution containing a minimum of 200 PPM of chlorine and allowed to stand for three hours.

- 5. After chlorination, flush lines of chlorinated water and refill from domestic supply. Continue flushing until residual chlorine is less than or equal to 0.2 ppm, or a residual the same as that of the test water.
 - G. Chemical and bacteriological tests shall be conducted by a state-certified laboratory and approved by the local authorities having jurisdiction.
 - H. Submit written report to Health Department as required by State Regulations. Provide a copy of report to Architect prior to completion of project.
 - I. The costs of sterilization and laboratory testing shall be paid for by the contractor.
- 3.10 CLEANING**
- A. Upon completion of work of this Section promptly remove from the working area all scraps, debris and surplus material of this Section.

END OF SECTION

*s:\master specifications\division 33 - utilities\33 0000_utilities.docx
Formatting Updated: 9-13-21*

PART 1 - GENERAL

1.1 SUMMARY

- A. Summary Includes:
 - 1. Storm drainage piping systems.

1.2 RELATED REQUIREMENTS

- A. Section 01 5000, Construction Facilities and Controls.
- B. Section 01 6116, Volatile Organic Compound (VOC) Restrictions, for VOC limits pertaining to adhesives, sealants, fillers, primers, and coatings.
- C. Section 01 8113, Sustainable Design Requirements, for CAL-Green **[and Collaborative for High Performance Schools (CHPS)]** general requirements and procedures.
- D. Section 31 0000, Earthwork.
- E. Section 31 2333, Trenching and Backfilling.
- F. Section 32 1200, Asphalt Concrete Paving.
- G. Section 32 1600, Site Concrete

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CAL Green), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- C. California Plumbing Code, (CPC), edition as noted on the Drawings.
- D. Local Jurisdiction: Any work within the street, highway or right-of-way shall be performed in accordance with the requirement of the governmental agencies having jurisdiction, and shall not begin until all of those governing authorities have been notified.
- E. ASTM International (ASTM):
 - 1. D 422-63 Test Method for Particle Size Analysis of Soil.
 - 2. D698-00 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures, Using 5.5 lb (2.49 Kg) Rammer and 12 inch (304.8 mm) Drop.
 - 3. D1556-00 - Test Method for Density of Soil in Place by the Sand-Cone Method.
 - 4. D1557-02 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 10 lb. (4.54 Kg) Rammer and 18 inch (457 mm) Drop.

STORM DRAINAGE UTILITIES
SECTION 33 4000
3595001000

5. D 3017-05 Test Methods for Moisture Content of Soils and Soil-Aggregate Mixture by Nuclear Methods (Shallow Depth).
6. D 4318-05 Test Method for Liquid Limit, Plastic Limit, and Plasticity Limit.

F. CALTRANS Standard Specifications.

G. CAL-OSHA, Title 8, Section 1590 (e).

1.4 ADMINISTRATIVE REQUIREMENTS

A. Submittal Procedures:

1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
3. Sustainable Design Submittals shall comply with the additional requirements of Section 01 8113, Sustainable Design Requirements.

1.5 ACTION SUBMITTALS

- A. Provide supplier's descriptive literature for all products to demonstrate compliance with specified attributes.
- B. Substitution: Provide all data of proposed material being submitted as a substitution. Provide comparison with specified product data and identify all differences. Failure to provide comparison will be reason for rejection.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: Contractor / installer.
- B. Provide sieve analysis from accredited testing lab on pipe bedding material. Analysis shall have a current date not older than project contract signing date.
- C. Sustainable Design:
1. General:
 - a. Submit information necessary to establish and document compliance with the California Green Building Standards Code.
 - b. Sustainable design submittals are in addition to other submittals.
 2. The following information shall be provided:
 - a. Adhesives and Sealants: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.
 - b. Paints and Coatings: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.

1.7 CLOSEOUT SUBMITTALS

- A. Guarantee: Submit subcontractor's guarantee.

1.8 QUALITY ASSURANCE

- A. Contractor / Installer shall have been in business for five (5) years providing/finishing similar size projects and complexity.
- B. Contractor shall be solely responsible for all subgrades built. Any repairs resulting from inadequate compaction are the responsibility of the contractor.
- C. The representatives of the Owner's testing lab will not act as supervisor of construction, nor will they direct construction operations. Neither the presence of the Owner's testing lab representatives nor the testing by the Owner's testing lab shall excuse the contractors or subcontractors for defects discovered in their work during or following completion of the project. Correcting inadequate compaction is the sole responsibility of the contractor.
- D. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.
 - 1. Sun damaged or discolored PVC pipe will be rejected.
- E. All materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.

1.9 DELIVERY, STORAGE AND HANDLING

- A. Transport, store and handle in strict accord with the local jurisdiction and manufacturer's written recommendations
- B. Deliver undamaged products to job in manufacturer's sealed containers and/or original bundles with tags and labels intact.

1.10 EXISTING SITE CONDITIONS

- A. Contractor shall acquaint himself with all site conditions. If unknown active utilities are encountered during work, notify Architect promptly for instructions. Failure to notify will make Contractor liable for damage to these utilities arising from Contractor's operations subsequent to discovery of such unknown active utilities.
- B. Existing civil, mechanical and electrical improvements are shown on respective site plans to the extent known. Should the Contractor encounter any deviation between actual conditions and those shown, he is to immediately notify the Architect before continuing work.

1.11 PROTECTION

- A. Adequate protection measures shall be provided to protect workmen and passers-by on and off the site. Adjacent property shall be fully protected throughout the operations.

STORM DRAINAGE UTILITIES
SECTION 33 4000
3595001000

Blasting will not be permitted. Prevent damage to adjoining improvements and properties both above and below grade. Restore such improvements to original condition should damage occur. Replace trees and shrubs outside building area disturbed by operations.

- B. In accordance with generally accepted construction practices, the Contractor shall be solely and completely responsible for working conditions at the job site, including safety of all persons and property during performance of the work. This requirement shall apply continuously and shall not be limited to normal working hours.
- C. Any construction review of the Contractor's performance conducted by the Geotechnical Engineer is not intended to include review of the adequacy of the Contractor's safety measures, in, on, or near the construction site.
- D. Provide shoring, sheeting, sheet piles and/or bracing to prevent caving, erosion or gullyng of sides of excavation.
- E. Surface Drainage: Provide for surface drainage during period of construction in manner to avoid creating nuisance to adjacent areas. The contractor shall make a reasonable effort on a daily basis to provide pumps and all equipment necessary to keep all excavations and the site free from water during entire progress of work, regardless of cause, source, or nature of water.
- F. Adjacent streets and sidewalks shall be kept free of mud, dirt or similar nuisances resulting from earthwork operations.
- G. The site and adjacent influenced areas shall be watered as required to suppress dust nuisance. Dust control measures shall be in accordance with the local jurisdiction.
- H. Trees: Carefully protect existing trees that are to remain.

1.12 SEASONAL LIMITS

- A. No fill material shall be placed, spread or rolled during unfavorable weather conditions. When work is interrupted by rains, fill operations shall not be resumed until field tests indicate that moisture content and density of fill are satisfactory.

1.13 TESTING

- A. General: Refer to Section 01 4523 – Testing and Inspection Services, and Structural Tests and Inspections List, DSA-103.
- B. Geotechnical Engineer: Owner is retaining a Geotechnical Engineer to determine compliance of fill with Specifications, and to direct adjustments in fill operations. Costs of Geotechnical Engineer will be borne by Owner; except those costs incurred for re-tests or re-inspection will be paid by Owner and backcharged to Contractor.

1.14 RECORD DRAWINGS

- A. Keep a daily record of all pipe placed in ground, verified by Project Inspector.

STORM DRAINAGE UTILITIES
SECTION 33 4000
3595001000

- B. Upon completion of this Contract, furnish one tracing showing all outside utility lines, piping, etc., installed under this Contract. Locate and dimension all work with reference to permanent landmarks.
- C. All symbols and designations used in preparing "RECORD" drawings shall match those used in Contract drawings.
- D. Properly identify all stubs for future connections, as to location and use, by setting of concrete marker at finished grade in the manner suitable to Architect.

PART 2 - PRODUCTS

2.1 DESIGN AND PERFORMANCE CRITERIA

- A. Sustainable Design:
 - 1. VOC emissions for field-applied adhesives, sealants, and sealant primers must comply with limits specified in Section 01 6116.
 - 2. VOC emissions for field-applied paints and coatings must comply with limits specified in Section 01 6116.

2.2 MATERIALS

- A. Pipe: Use one of the following, unless noted on the Drawings otherwise.
 - 1. Polyvinyl Chloride Pipe (PVC): SDR35 conforming to ASTM D3034 with elastomeric joints conforming to ASTM D3212 for pipe to 12". Sun damaged pipe will be rejected.
 - 2. High density polyethylene pipe (HDPE): The pipe shall be corrugated exterior/smooth interior pipe. 12" to 60" maximum diameter shall conform to AASHTO M294, water tight per ASTM D3212 with water tight gasket fittings.
- B. Perforated Pipe (for subdrains): Shall be ADS N12 pipe, 3 hole, ASTM F 405, AASHTO M 252; PCV ASTM D3034 SDR-35 storm drain pipe
- C. Manhole: Shall be as shown on the drawing details.
- D. Drop Inlet: Shall be as shown on the drawing details.
- E. Curb Inlet: Shall be as shown on the drawing details.
- F. Mortar: For pipe connections to concrete drainage structures, conform to ASTM C270 type N mortar. Place within one half hour after adding water.
- G. Crushed Rock: Imported washed crushed rock. Minimum 100% passing 3/4 inch sieve.
- H. Trench drain: Polycast, Polydrain or equal and as shown on drawings.
- I. Area Drains: Shall be as shown on the drawing details.

STORM DRAINAGE UTILITIES
SECTION 33 4000
3595001000

- J. Floor Drains: Shall be as shown on the drawing details.
- K. Clean-outs: Shall be as shown on the drawing details.
- L. Planter drains: Shall be as detailed on the drawing details.
- M. Filter Fabric: Mirafi 140N.

PART 3 - EXECUTION

3.1 INSPECTION LAYOUT AND PREPARATION

- A. Prior to installation of the work of this Section, carefully inspect and verify by field measurements that installed work of all other trades is complete to the point where this installation may properly commence
- B. Layout all work, establish grades, locate existing underground utilities, set markers and stakes, setup and maintain barricades and protection facilities; all prior to beginning actual earthwork operations. Layout and staking shall be done by a licensed Land Surveyor or Professional Civil Engineer.
- C. Verify that specified items may be installed in accordance with the approved design.
- D. In event of discrepancy, immediately notify Owner and the Architect. Do not proceed in discrepant areas until discrepancies have been fully resolved.

3.2 EXCAVATION AND BACKFILLING

- A. General: Installation shall be in strict conformance with referenced standards, the manufacturer's written directions, as shown on the drawings and as herein specified.
- B. Verify invert elevations at points of connection to existing systems prior to any excavation. If invert elevations differ from that shown on drawings, notify Architect immediately.
- C. Excavation and Bedding:
 - 1. General: Trench straight and true to line and grade with bottom smooth and free of irregularities or rock points. Trench width in accordance with pipe manufacturer's recommendations and as per the drawings. Follow manufacturer's recommendations for use of each kind and type of pipe.
 - 2. Bedding: Provide bedding as detailed on plans for the full length of the pipe. Bedding shall have a minimum thickness beneath the pipe of 4" or 1/8 the outside diameter of the pipe, whichever is greater. Provide bell holes and depressions for pipe joints only of size required to properly make joint.
 - 3. If the trenches for the site drainage fall within areas to be lime treated, the piping shall be installed prior to any lime treatment operations.
 - a. If additional piping is added to previously lime treated areas, the contractor shall backfill the trench with class 2 aggregate base and compact to 95%.

STORM DRAINAGE UTILITIES
SECTION 33 4000
3595001000

D. Laying of Pipe:

1. General: Inspect pipe prior to placing. Set aside any defective or damaged material. Do not place pipe in water nor place pipe when trenches or weather are unsuitable. Lay pipe upgrade, true to line and grade.
2. Bell and Spigot Joints: Lubricate inside of bells and outside of spigots with soap solution or as recommended by manufacture. Wedge joints tight. Bell of bell and spigot pipe to be pointed upgrade.
3. Pipe shall be bedded uniformly throughout its length.
4. Pipe elevation shall be within 0.02 feet of design elevation as shown on plans.
5. Off Site Work: All work beyond the property lines shall be done in strict conformance with the requirements of the governing agency.

E. Backfilling:

1. General: Do not start backfill operations until required testing has been accomplished.
2. Trenches and Excavations: Backfill with material as detailed on plans, filling both sides of the pipe at the same time, carefully tamping to hold pipe in place without movement. Refer to Section 31 2333 – TRENCHING AND BACKFILLING for fill above this layer.

F. Grouting of Pipes: Grout pipes smooth and water tight at drop inlet, manholes, and curb inlets. Grout back side of hood at curb inlets all grouting shall be smooth and consistent.

G. Off Site Work: All work beyond the property lines shall be done in strict conformance with the requirements of the local agency.

H. Cutting and Patching: Remove and replace existing surface features per applicable specification section (i.e. asphaltic concrete or concrete paving) where pipe is installed in areas of existing improvements.

3.3 TOLERANCES

A. Storm Drain structure grates

1. In landscape and lawn areas $\pm 0.05'$.
2. In sidewalk and asphalt pavement $\pm 0.025'$.
3. In curb and gutter application $\pm 0.0125'$.

B. Cleanout Boxes and Lids

1. In landscape areas; 0.10 higher than surrounding finish grade, $\pm 0.05'$.
2. In sidewalks and asphalt pavement; Flush with surrounding finish grade, $\pm 0.025'$.

3.4 DEWATERING

A. Contractor to provide trench dewatering as necessary, no matter what the source is, at no additional cost to the owner.

STORM DRAINAGE UTILITIES
SECTION 33 4000
3595001000

3.5 FLUSHING

- A. The Contractor shall thoroughly ball and flush the storm drain system to remove all dirt and debris. Discharge water to an approved location.

3.6 CLEANING

- A. Upon completion of work of this Section promptly remove from the working area all scraps, debris and surplus material of this Section.
- B. Clean the dirt, rocks, and debris from the drop inlets and storm drain manholes.

END OF SECTION

**Wanda Hirsch Elementary School -
TK Portable Classroom Building**

1280 Dove Dr., Tracy, CA 95376

3595001

Tracy Unified School District

1875 W Lowell Ave., Tracy, CA 95376



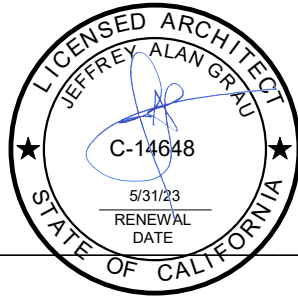
April 04, 2024

Wanda Hirsch Elementary School - TK Portable Classroom Building
Tracy Unified School District
Tracy, California

February 28, 2024

HMC # 3595001

DSA Appl. #02-122128
DSA File #39-73



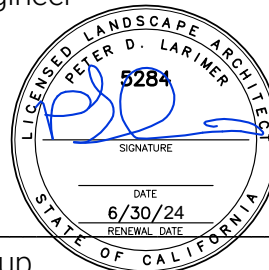
HMC ARCHITECTS
Architect



Warren Consulting Engineers
Civil Engineer



Optimized Energy & Facilities Consulting
Electrical Engineer



MTW Group
Landscape Architect

TABLE OF CONTENTS

DIVISION 00 - PROCUREMENT AND CONTRACTING REQUIREMENTS - NOT USED

DIVISION 01 - GENERAL REQUIREMENTS

SECTION	01 1100 - Summary of Work
	01 2513 - Product Options and Substitutions
	01 2600 - Changes in the Work
	01 2900 - Application for Payment and Conditional and Unconditional Waiver and Release Forms
	01 3119 - Project Meetings
	01 3213 - Scheduling of Work
	01 3300 - Submittal Procedures (Including Submittal Transmittal, Substitution Request, RFI, Electronic Data Request, Megger Grounding Test Certificate, Certification of Chlorination and Sterilization, Certification of Compliance for Building Materials)
	01 3513.23 - Site Standards
	01 3543 - Environmental Procedures
	01 4100 - Regulatory Requirements
	01 4213 - Abbreviations and Acronyms
	01 4216 - Definitions
	01 4219 - References
	01 4300 - Materials and Equipment
	01 4500 - Quality Control
	01 4523 - Testing and Inspection Services
	01 5000 - Temporary Facilities and Controls
	01 5013 - Construction Waste Management and Disposal
	01 5213 - Field Offices
	01 6116 - Volatile Organic Compound (VOC) Restrictions
	01 6600 - Product Delivery Storage and Handling
	01 7329 - Cutting and Patching
	01 7600 - Alteration Project Procedures
	01 7700 - Contract Closeout and Final Cleaning
	01 7823 - Operation and Maintenance Data
	01 7836 - Warranties (Including Contractor Standard Warranty Form, Subcontractor Standard Warranty Form, Special Extended Warranty Form)
	01 7839 - Record Documents
	01 8113 - Sustainable Design Requirements

DIVISION 02 - EXISTING CONDITIONS - NOT USED

DIVISION 03 - CONCRETE - NOT USED

DIVISION 04 - MASONRY - NOT USED

DIVISION 05 - METALS - NOT USED

DIVISION 06 - WOOD, PLASTICS, AND COMPOSITES - NOT USED

DIVISION 07 - THERMAL AND MOISTURE PROTECTION

SECTION	07 9200 - Joint Sealants
---------	--------------------------

DIVISION 08 - OPENINGS - NOT USED

DIVISION 09 - FINISHES

SECTION	09 9100 - Painting
---------	--------------------

DIVISION 10 - SPECIALTIES

SECTION	10 1116 - Markerboards
---------	------------------------

TABLE OF CONTENTS

10 1400 - Signage
10 2813 - Toilet Accessories
10 4416 - Fire Extinguishers and Cabinets

DIVISION 11 - EQUIPMENT - NOT USED

DIVISION 12 - FURNISHINGS

SECTION 12 2113 - Horizontal Louver Blinds
12 3216 - Manufactured Plastic-Laminate-Clad Casework
12 3623 - Plastic-Laminate-Clad Countertops

DIVISION 13 - SPECIAL CONSTRUCTION - NOT USED

DIVISION 14 - CONVEYING EQUIPMENT - NOT USED

DIVISION 21 - FIRE SUPPRESSION - NOT USED

DIVISION 22 - PLUMBING - NOT USED

DIVISION 23 - HEATING, VENTILATING AND AIR CONDITIONING (HVAC) - NOT USED

DIVISION 26 - ELECTRICAL

SECTION 26 0100 - Electrical Basic Requirements
26 0533 - Raceway and Boxes for Electrical Systems
26 2716 - Cabinets and Enclosures
26 2800 - Circuit Protective Devices
26 6116 - Fire Alarm

DIVISION 27 - COMMUNICATIONS

SECTION 27 1000 - Data Communications
27 5123 - Sound and Communications

DIVISION 28 - ELECTRONIC SAFETY AND SECURITY

SECTION 28 3100 - Intrusion Alarm System

DIVISION 31 - EARTHWORK

SECTION 31 0000 - Earthwork
31 2333 - Trenching and Backfilling

DIVISION 32 - EXTERIOR IMPROVEMENTS

SECTION 32 1600 - Site Concrete
32 3113 - Chain Link Fences and Gates
32 8000 - Irrigation
32 9000 - Landscaping

DIVISION 33 - UTILITIES

SECTION 33 0000 - Utilities
33 4000 - Storm Drainage Utilities

"All rights reserved. This Project Manual or any part hereof may not be duplicated without the written consent of Rainforth Grau Architects except in the form of excerpts or quotations for the purpose of review."

SUMMARY OF WORK

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Site Access Conditions and Requirements;
- B. Special Conditions.

1.02 SUMMARY OF WORK COVERED BY CONTRACT DOCUMENTS

- A. The Work of this Contract consists of the following at Wanda Hirsch Elementary School:
 - (1) Selective demolition and construction for preparation of the site to receive 1 - 36'x40' relocatable building, including associated civil, architectural and electrical work as indicated in the drawings.

1.03 CONTRACTS

- A. Perform the Work under a single, fixed-price Contract.

1.04 WORK BY OTHERS

- A. Construction of 1 - 36'x40' classroom building by portable manufacturer

1.05 CODES, REGULATIONS, AND STANDARDS

- A. The codes, regulations, and standards adopted by the state and federal agencies having jurisdiction shall govern minimum requirements for this Project. Where codes, regulations, and standards conflict with the Contract Documents, these conflicts shall be brought to the immediate attention of the District and the Architect.
- B. Codes, regulations, and standards shall be as published effective as of date of bid opening, unless otherwise specified or indicated.

1.06 PROJECT RECORD DOCUMENTS

- A. Contractor shall maintain on Site one set of the following record documents; Contractor shall record actual revisions to the Work:
 - (1) Contract Drawings.
 - (2) Specifications.

- (3) Addenda.
 - (4) Change Orders and other modifications to the Contract.
 - (5) Reviewed shop drawings, product data, and samples.
 - (6) Field test records.
 - (7) Inspection certificates.
 - (8) Manufacturer's certificates.
- B. Contractor shall store Record Documents separate from documents used for construction. Provide files, racks, and secure storage for Record Documents and samples.
 - C. Contractor shall record information concurrent with construction progress.
 - D. Specifications: Contractor shall legibly mark and record at each product section of the Specifications the description of the actual product(s) installed, including the following:
 - (1) Manufacturer's name and product model and number.
 - (2) Product substitutions or alternates utilized.
 - (3) Changes made by Addenda and Change Orders and written directives.

1.07 EXAMINATION OF EXISTING CONDITIONS

- A. Contractor shall be held to have examined the Project Site and acquainted itself with the conditions of the Site and of the streets or roads approaching the Site.
- B. Prior to commencement of Work, Contractor shall survey the Site and existing buildings and improvements to observe existing damage and defects such as cracks, sags, broken, missing or damaged glazing, other building elements and Site improvements, and other damage.
- C. Should Contractor observe cracks, sags, and other damage to and defects of the Site and adjacent buildings, paving, and other items not indicated in the Contract Documents, Contractor shall immediately report same to the District and the Architect.

1.08 CONTRACTOR'S USE OF PREMISES

- A. If unoccupied and only with District's prior written approval, Contractor may use the building(s) at the Project Site without limitation for its operations, storage, and office facilities for the performance of the Work. If the District chooses to beneficially occupy any building(s), Contractor must obtain the District's written approval for Contractor's use of spaces and types of operations to be performed within the building(s) while so occupied. Contractor's access to the building(s) shall be limited to the areas indicated.

- B. If the space at the Project Site is not sufficient for Contractor's operations, storage, office facilities and/or parking, Contractor shall arrange and pay for any additional facilities needed by Contractor.
- C. Contractor shall not interfere with use of or access to occupied portions of the building(s) or adjacent property.
- D. Contractor shall maintain corridors, stairs, halls, and other exit-ways of building clear and free of debris and obstructions at all times.
- E. No one other than those directly involved in the demolition and construction, or specifically designated by the District or the Architect shall be permitted in the areas of work during demolition and construction activities.
- F. The Contractor shall install the construction fence and maintain that it will be locked when not in use. Keys to this fencing will be provided to the District.

1.09 PROTECTION OF EXISTING STRUCTURES AND UTILITIES

- A. The Drawings show above-grade and below-grade structures, utility lines, and other installations that are known or believed to exist in the area of the Work. Contractor shall locate these existing installations before proceeding with excavation and other operations that could damage same; maintain them in service, where appropriate; and repair damage to them caused by the performance of the Work. Should damage occur to these existing installations, the costs of repair shall be at the Contractor's expense and made to the District's satisfaction.
- B. Contractor shall be alert to the possibility of the existence of additional structures and utilities. If Contractor encounters additional structures and utilities, Contractor will immediately report to the District for disposition of same as indicated in the General Conditions.

1.10 UTILITY SHUTDOWNS AND INTERRUPTIONS

- A. Contractor shall give the District a minimum of three (3) days written notice in advance of any need to shut off existing utility services or to effect equipment interruptions. The District will set exact time and duration for shutdown, and will assist Contractor with shutdown. Work required to re-establish utility services shall be performed by the Contractor.
- B. Contractor shall obtain District's written approval as indicated in the General Conditions in advance of deliveries of material or equipment or other activities that may conflict with District's use of the building(s) or adjacent facilities.

1.11 STRUCTURAL INTEGRITY

- A. Contractor shall be responsible for and supervise each operation and work that could affect structural integrity of various building elements, both permanent and temporary.
- B. Contractor shall include structural connections and fastenings as indicated or required for complete performance of the Work.

PART 2 – PRODUCTS Not Used.

PART 3 – EXECUTION Not Used.

END OF DOCUMENT

PRODUCT OPTIONS AND SUBSTITUTIONS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. Instructions to Bidders;
- B. General Conditions, including, without limitation, Substitutions For Specified Items; and
- C. Special Conditions.

1.02 SUBSTITUTIONS OF MATERIALS AND EQUIPMENT

- A. Catalog numbers and specific brands or trade names followed by the designation "or equal" are used in conjunction with material and equipment required by the Specifications to establish the standards of quality, utility, and appearance required. Substitutions which are equal in quality, utility, and appearance to those specified may be reviewed subject to the provisions of the General Conditions.
- B. Wherever more than one manufacturer's product is specified, the first-named product is the basis for the design used in the work and the use of alternative-named manufacturers' products or substitutes may require modifications in that design. If such alternatives are proposed by Contractor and are approved by the District and/or the Architect, Contractor shall assume all costs required to make necessary revisions and modifications of the design resulting from the substitutions requested by the Contractor.
- C. When materials and equipment are specified by first manufacturer's name and product number, second manufacturer's name and "or approved equal," supporting data for the second product, if proposed by Contractor, shall be submitted in accordance with the requirements for substitutions. The District's Board has found and determined that certain item(s) shall be used on this Project based on the purpose(s) indicated pursuant to Public Contract Code section 3400(c). These findings, as well as the products and brand or trade names, have been identified in the Notice to Bidders.
- D. The Contractor will not be allowed to substitute specified items unless the request for substitution is submitted as follows:
 - (1) District must receive any notice of request for substitution of a specified item a minimum of ten (10) calendar days prior to bid opening.

- (2) Within 35 days after the date of the Notice of Award, the Contractor shall submit data substantiating the request(s) for all substitution(s) containing sufficient information to assess acceptability of product or system and impact on Project, including, without limitation, the requirements specified in the Special Conditions and the technical Specifications. Insufficient information shall be grounds for rejection of substitution.
- E. If the District and/or Architect, in reviewing proposed substitute materials and equipment, require revisions or corrections to be made to previously accepted Shop Drawings and supplemental supporting data to be resubmitted, Contractor shall promptly do so. If any proposed substitution is judged by the District and/or Architect to be unacceptable, the specified material or equipment shall be provided.
- F. Samples may be required. Tests required by the District and/or Architect for the determination of quality and utility shall be made at the expense of Contractor, with acceptance of the test procedure first given by the District.
- G. In reviewing the supporting data submitted for substitutions, the District and/or Architect will use for purposes of comparison all the characteristics of the specified material or equipment as they appear in the manufacturer's published data even though all the characteristics may not have been particularly mentioned in the Contract Documents. If more than two (2) submissions of supporting data are required, the cost of reviewing the additional supporting data shall be borne by Contractor, and the District will deduct the costs from the Contract Price. The Contractor shall be responsible for any re-design costs occasioned by District's acceptance and/or approval of any substitute.
- H. The Contractor shall, in the event that a substitute is less costly than that specified, credit the District with one hundred percent (100%) of the net difference between the substitute and the originally specified material. In this event, the Contractor agrees to execute a deductive Change Order to reflect that credit. In the event Contractor furnishes a material, process, or article more expensive than that specified, the difference in the cost of that material, process, or article so furnished shall be borne by Contractor.
- I. In no event shall the District be liable for any increase in Contract Price or Contract Time due to any claimed delay in the evaluation of any proposed substitute or in the acceptance or rejection of any proposed substitute.

PART 2 – PRODUCTS Not Used.

PART 3 – EXECUTION Not Used.

END OF DOCUMENT

DOCUMENT 01 26 00

CHANGES IN THE WORK

CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE PROVISIONS IN THE AGREEMENT, GENERAL CONDITIONS, AND SPECIAL CONDITIONS, IF USED, RELATED TO CHANGES AND/OR REQUESTS FOR CHANGES.

END OF DOCUMENT

DOCUMENT 01 29 00

**APPLICATION FOR PAYMENT AND
CONDITIONAL AND UNCONDITIONAL WAIVER AND RELEASE FORMS**

**CONTRACTOR SHALL COMPLY WITH ALL PROVISIONS IN THE GENERAL
CONDITIONS RELATED TO APPLICATIONS FOR PAYMENT AND/OR PAYMENTS.**

**CONDITIONAL WAIVER AND RELEASE
ON PROGRESS PAYMENT
(CIVIL CODE SECTION 8132)**

NOTICE: THIS DOCUMENT WAIVES THE CLAIMANT'S LIEN, STOP PAYMENT NOTICE, AND PAYMENT BOND RIGHTS EFFECTIVE ON RECEIPT OF PAYMENT. A PERSON SHOULD NOT RELY ON THIS DOCUMENT UNLESS SATISFIED THAT THE CLAIMANT HAS RECEIVED PAYMENT.

Name of Claimant: _____

Name of Customer: _____

Job Location: _____

Owner: _____

Through Date: _____

Conditional Waiver and Release

This document waives and releases lien, stop payment notice, and payment bond rights the claimant has for labor and service provided, and equipment and material delivered, to the customer on this job through the Through Date of this document. Rights based upon labor or service provided, or equipment or material delivered, pursuant to a written change order that has been fully executed by the parties prior to the date that this document is signed by the claimant, are waived and released by this document, unless listed as an Exception below. This document is effective only on the claimant's receipt of payment from the financial institution on which the following check is drawn:

Maker of Check: _____

Amount of Check: \$_____

Check Payable to: _____

Exceptions

This document does not affect any of the following:

- (1) Retentions.
- (2) Extras for which the claimant has not received payment.
- (3) The following progress payments for which the claimant has previously given a conditional waiver and release but has not received payment:

Date(s) of waiver and release: _____

Amount(s) of unpaid progress payment(s): \$_____

TRACY UNIFIED SCHOOL DISTRICT

**APPLICATION FOR PAYMENT AND
CONDITIONAL AND UNCONDITIONAL
WAIVER AND RELEASE FORMS
DOCUMENT 01 29 00-2**

- (4) Contract rights, including (A) a right based on rescission, abandonment, or breach of contract, and (B) the right to recover compensation for work not compensated by the payment.

Claimant's Signature: _____

Claimant's Title: _____

Date of Signature: _____

**UNCONDITIONAL WAIVER AND RELEASE
ON PROGRESS PAYMENT
(CIVIL CODE SECTION 8134)**

NOTICE TO CLAIMANT: THIS DOCUMENT WAIVES AND RELEASES LIEN, STOP PAYMENT NOTICE, AND PAYMENT BOND RIGHTS UNCONDITIONALLY AND STATES THAT YOU HAVE BEEN PAID FOR GIVING UP THOSE RIGHTS. THIS DOCUMENT IS ENFORCEABLE AGAINST YOU IF YOU SIGN IT, EVEN IF YOU HAVE NOT BEEN PAID. IF YOU HAVE NOT BEEN PAID, USE A CONDITIONAL WAIVER AND RELEASE FORM.

Name of Claimant: _____

Name of Customer: _____

Job Location: _____

Owner: _____

Through Date: _____

Unconditional Waiver and Release

This document waives and releases lien, stop payment notice, and payment bond rights the claimant has for labor and service provided, and equipment and material delivered, to the customer on this job through the Through Date of this document. Rights based upon labor or service provided, or equipment or material delivered, pursuant to a written change order that has been fully executed by the parties prior to the date that this document is signed by the claimant, are waived and released by this document, unless listed as an Exception below. The claimant has received the following progress payment: \$_____

Exceptions

This document does not affect any of the following:

- (1) Retentions.
- (2) Extras for which the claimant has not received payment.
- (3) Contract rights, including (A) a right based on rescission, abandonment, or breach of contract, and (B) the right to recover compensation for work not compensated by the payment.

Claimant's Signature: _____

Claimant's Title: _____

Date of Signature: _____

**CONDITIONAL WAIVER AND RELEASE
ON FINAL PAYMENT
(CIVIL CODE SECTION 8136)**

NOTICE: THIS DOCUMENT WAIVES THE CLAIMANT'S LIEN, STOP PAYMENT NOTICE, AND PAYMENT BOND RIGHTS EFFECTIVE ON RECEIPT OF PAYMENT. A PERSON SHOULD NOT RELY ON THIS DOCUMENT UNLESS SATISFIED THAT THE CLAIMANT HAS RECEIVED PAYMENT.

Name of Claimant: _____

Name of Customer: _____

Job Location: _____

Owner: _____

Conditional Waiver and Release

This document waives and releases lien, stop payment notice, and payment bond rights the claimant has for labor and service provided, and equipment and material delivered, to the customer on this job. Rights based upon labor or service provided, or equipment or material delivered, pursuant to a written change order that has been fully executed by the parties prior to the date that this document is signed by the claimant, are waived and released by this document, unless listed as an Exception below. This document is effective only on the claimant's receipt of payment from the financial institution on which the following check is drawn:

Maker of Check:

Amount of Check: \$_____

Check Payable to: _____

Exceptions

This document does not affect any of the following: _____

Disputed claims for extras in the amount of: \$_____

Claimant's Signature: _____

Claimant's Title: _____

Date of Signature: _____

**UNCONDITIONAL WAIVER AND RELEASE
ON FINAL PAYMENT**
(CIVIL CODE SECTION 8138)

NOTICE TO CLAIMANT: THIS DOCUMENT WAIVES AND RELEASES LIEN, STOP PAYMENT NOTICE, AND PAYMENT BOND RIGHTS UNCONDITIONALLY AND STATES THAT YOU HAVE BEEN PAID FOR GIVING UP THOSE RIGHTS. THIS DOCUMENT IS ENFORCEABLE AGAINST YOU IF YOU SIGN IT, EVEN IF YOU HAVE NOT BEEN PAID. IF YOU HAVE NOT BEEN PAID, USE A CONDITIONAL WAIVER AND RELEASE FORM.

Name of Claimant: _____

Name of Customer: _____

Job Location: _____

Owner: _____

Unconditional Waiver and Release

This document waives and releases lien, stop payment notice, and payment bond rights the claimant has for all labor and service provided, and equipment and material delivered, to the customer on this job. Rights based upon labor or service provided, or equipment or material delivered, pursuant to a written change order that has been fully executed by the parties prior to the date that this document is signed by the claimant, are waived and released by this document, unless listed as an Exception below. The claimant has been paid in full.

Exceptions

This document does not affect any of the following: _____

Disputed claims for extras in the amount of: \$_____

Claimant's Signature: _____

Claimant's Title: _____

Date of Signature: _____

PROJECT MEETINGS

PART 1 – GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions; and
- B. Special Conditions.

1.02 PROGRESS MEETINGS:

- A. Contractor shall schedule and hold regular weekly progress meetings after a minimum of one week's prior written notice of the meeting date and time to all Invitees as indicated below.
- B. Location: Contractor's field office.
- C. The Contractor shall notify and invite the following entities ("Invitees"):
 - (1) District Representative.
 - (2) Contractor.
 - (3) Contractor's Project Manager.
 - (4) Contractor's Superintendent.
 - (5) Subcontractors, as appropriate to the agenda of the meeting.
 - (6) Suppliers, as appropriate to the agenda of the meeting.
 - (7) Construction Manager, if any.
 - (8) Architect
 - (9) Engineer(s), if any and as appropriate to the agenda of the meeting.
 - (10) Others, as appropriate to the agenda of the meeting.
- D. The District's and/or the Architect's Consultants will attend at their discretion, in response to the agenda.
- E. The District representative, the Construction Manager, and/or another District Agent shall take and distribute meeting notes to attendees and other concerned parties. If exceptions are taken to anything in the meeting notes,

those exceptions shall be stated in writing to the District within five (5) working days following District's distribution of the meeting notes.

1.03 PRE-INSTALLATION/PERFORMANCE MEETING:

- A. Contractor shall schedule a meeting prior to the start of each of the demolition work phases. Contractor shall invite all Invitees to this meeting, and others whose work may affect or be affected by the quality of the demolition work.
- B. Contractor shall review in detail prior to this meeting, the manufacturer's requirements and specifications, applicable portions of the Contract Documents, Shop Drawings, and other submittals, and other related work. At this meeting, invitees shall review and resolve conflicts, incompatibilities, or inadequacies discovered or anticipated.
- C. Contractor shall review in detail Project conditions, schedule, requirements for performance, application, installation, and quality of completed Work, and protection of adjacent Work and property.
- D. Contractor shall review in detail means of protecting the completed Work during the remainder of the construction period.

PART 2 - PRODUCTS Not Used.

PART 3 - EXECUTION Not Used.

END OF DOCUMENT

SCHEDULING OF WORK

PART 1 – GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions;
- B. Special Conditions;
- C. Summary of Work; and
- D. Submittals.

1.02 SECTION INCLUDES

- A. Scheduling of Work under this Contract shall be performed by Contractor in accordance with requirements of this Section.
 - (1) Development of schedule, cost and resource loading of the schedule, monthly payment requests, and project status reporting requirements of the Contract shall employ computerized Critical Path Method ("CPM") scheduling ("CPM Schedule").
 - (2) CPM Schedule shall be cost loaded based on Schedule of Values as approved by District.
 - (3) Submit schedules and reports as specified in the General Conditions.
- B. Upon Award of Contract, Contractor shall immediately commence development of Initial and Original CPM Schedules to ensure compliance with CPM Schedule submittal requirements.

1.03 CONSTRUCTION SCHEDULE

- A. Within ten (10) days of issuance of the issuance Notice to Proceed and before request for first progress payment, the Contractor shall prepare and submit to the Project Manager a construction progress schedule conforming to the Milestone Schedule below.
- B. The Construction Schedule shall be continuously updated, and an updated schedule shall be submitted with each application for progress payment. Each revised schedule shall indicate the work actually accomplished during the previous period and the schedule for completion of the remaining work.

C. Milestone Schedule:

ACTIVITY DESCRIPTION

REQUIRED COMPLETION

CONSTRUCTION STARTS

05-26-2022

PHASE 1 DEMOLITION

PHASE 2 DEMOLITION

FINAL PROJECT COMPLETION

1.04 QUALIFICATIONS

- A. Contractor shall employ experienced scheduling personnel qualified to use the latest version of [i.e., Primavera Project Planner]. Experience level required is set forth below. Contractor may employ such personnel directly or may employ a consultant for this purpose.
- (1) The written statement shall identify the individual who will perform CPM scheduling.
 - (2) Capability and experience shall be verified by description of construction projects on which individual has successfully applied computerized CPM.
 - (3) Required level of experience shall include at least two (2) projects of similar nature and scope with value not less than three fourths ($\frac{3}{4}$) of the Total Bid Price of this Project. The written statement shall provide contact persons for referenced projects with current telephone and address information.
- B. District reserves the right to approve or reject Contractor's scheduler or consultant at any time. District reserves the right to refuse replacing of Contractor's scheduler or consultant, if District believes replacement will negatively affect the scheduling of Work under this Contract.

1.05 GENERAL

- A. Progress Schedule shall be based on and incorporate milestone and completion dates specified in Contract Documents.
- B. Overall time of completion and time of completion for each milestone shown on Progress Schedule shall adhere to times in the Contract, unless an earlier (advanced) time of completion is requested by Contractor and agreed to by District. Any such agreement shall be formalized by a Change Order.
- (1) District is not required to accept an early completion schedule, i.e., one that shows an earlier completion date than the Contract Time.
 - (2) Contractor shall not be entitled to extra compensation in event agreement is reached on an earlier completion schedule and Contractor completes its Work, for whatever reason, beyond completion date shown in its early completion schedule but within the Contract Time.

- (3) A schedule showing the work completed in less than the Contract Time, and that has been accepted by District, shall be considered to have Project Float. The Project Float is the time between the scheduled completion of the work and the Completion Date. Project Float is a resource available to both District and the Contractor.
- C. Ownership Project Float: Neither the District nor Contractor owns Project Float. The Project owns the Project Float. As such, liability for delay of the Completion Date rests with the party whose actions, last in time, actually cause delay to the Completion Date.
 - (1) For example, if Party A uses some, but not all of the Project Float and Party B later uses remainder of the Project Float as well as additional time beyond the Project Float, Party B shall be liable for the time that represents a delay to the Completion Date.
 - (2) Party A would not be responsible for the time since it did not consume the entire Project Float and additional Project Float remained; therefore, the Completion Date was unaffected by Party A.
- D. Progress Schedule shall be the basis for evaluating job progress, payment requests, and time extension requests. Responsibility for developing Contract CPM Schedule and monitoring actual progress as compared to Progress Schedule rests with Contractor.
- E. Failure of Progress Schedule to include any element of the Work, or any inaccuracy in Progress Schedule, will not relieve Contractor from responsibility for accomplishing the Work in accordance with the Contract. District's acceptance of schedule shall be for its use in monitoring and evaluating job progress, payment requests, and time extension requests and shall not, in any manner, impose a duty of care upon District, or act to relieve Contractor of its responsibility for means and methods of construction.
- F. Software: Use [i.e, District Project Planner for Windows, latest version]. Such software shall be compatible with Windows operating system. Contractor shall transmit contract file to District on compact disk at times requested by District.
- G. Transmit each item under the form approved by District.
 - (1) Identify Project with District Contract number and name of Contractor.
 - (2) Provide space for Contractor's approval stamp and District's review stamps.
 - (3) Submittals received from sources other than Contractor will be returned to the Contractor without District's review.

1.06 INITIAL CPM SCHEDULE

- A. Initial CPM Schedule submitted for review at the pre-construction conference shall serve as Contractor's schedule for up to ninety (90) calendar days after the Notice to Proceed.

- B. Indicate detailed plan for the Work to be completed in first ninety (90) days of the Contract; details of planned mobilization of plant and equipment; sequence of early operations; procurement of materials and equipment. Show Work beyond ninety (90) calendar days in summary form.
- C. Initial CPM Schedule shall be time scaled.
- D. Initial CPM Schedule shall be cost and resource loaded. Accepted cost and resource loaded schedule will be used as basis for monthly progress payments until acceptance of the Original CPM Schedule. Use of Initial CPM Schedule for progress payments shall not exceed ninety (90) calendar days.
- E. District and Contractor shall meet to review and discuss the Initial CPM Schedule within seven (7) calendar days after it has been submitted to District.
 - (1) District's review and comment on the schedule shall be limited to Contract conformance (with sequencing, coordination, and milestone requirements).
 - (2) Contractor shall make corrections to schedule necessary to comply with Contract requirements and shall adjust schedule to incorporate any missing information requested by District. Contractor shall resubmit Initial CPM Schedule if requested by District.
- F. If, during the first ninety (90) days after Notice to Proceed, the Contractor is of the opinion that any of the Work included on its Initial CPM Schedule has been impacted, the Contractor shall submit to District a written Time Impact Evaluation ("TIE") in accordance with Article 1.12 of this Section. The TIE shall be based on the most current update of the Initial CPM Schedule.

1.07 ORIGINAL CPM SCHEDULE

- A. Submit a detailed proposed Original CPM Schedule presenting an orderly and realistic plan for completion of the Work in conformance with requirements as specified herein.
- B. Progress Schedule shall include or comply with following requirements:
 - (1) Time scaled, cost and resource (labor and major equipment) loaded CPM schedule.
 - (2) No activity on schedule shall have duration longer than fifteen (15) work days, with exception of submittal, approval, fabrication and procurement activities, unless otherwise approved by District.
 - (a) Activity durations shall be total number of actual work days required to perform that activity.
 - (3) The start and completion dates of all items of Work, their major components, and milestone completion dates, if any.

- (4) District furnished materials and equipment, if any, identified as separate activities.
- (5) Activities for maintaining Project Record Documents.
- (6) Dependencies (or relationships) between activities.
- (7) Processing/approval of submittals and shop drawings for all material and equipment required per the Contract. Activities that are dependent on submittal acceptance or material delivery shall not be scheduled to start earlier than expected acceptance or delivery dates.
 - (a) Include time for submittals, re-submittals and reviews by District. Coordinate with accepted schedule for submission of Shop Drawings, samples, and other submittals.
 - (b) Contractor shall be responsible for all impacts resulting from re-submittal of Shop Drawings and submittals.
- (8) Procurement of major equipment, through receipt and inspection at jobsite, identified as separate activity.
 - (a) Include time for fabrication and delivery of manufactured products for the Work.
 - (b) Show dependencies between procurement and construction.
- (9) Activity description; what Work is to be accomplished and where.
- (10) The total cost of performing each activity shall be total of labor, material, and equipment, excluding overhead and profit of Contractor. Overhead and profit of the General Contractor shall be shown as a separate activity in the schedule. Sum of cost for all activities shall equal total Contract value.
- (11) Resources required (labor and major equipment) to perform each activity.
- (12) Responsibility code for each activity corresponding to Contractor or Subcontractor responsible for performing the Work.
- (13) Identify the activities which constitute the controlling operations or critical path. No more than twenty-five (25%) of the activities shall be critical or near critical. Near critical is defined as float in the range of one (1) to (10) days.
- (14) Twenty (20) workdays for developing punch list(s), completion of punch-list items, and final clean up for the Work or any designated portion thereof. No other activities shall be scheduled during this period.
- (15) Interface with the work of other contractors, District, and agencies such as, but not limited to, utility companies.

- (16) Show detailed Subcontractor Work activities. In addition, furnish copies of Subcontractor schedules upon which CPM was built.
 - (a) Also furnish for each Subcontractor, as determined by District, submitted on Subcontractor letterhead, a statement certifying that Subcontractor concurs with Contractor's Original CPM Schedule and that Subcontractor's related schedules have been incorporated, including activity duration, cost and resource loading.
 - (b) Subcontractor schedules shall be independently derived and not a copy of Contractor's schedule.
 - (c) In addition to Contractor's schedule and resource loading, obtain from electrical, mechanical, and plumbing Subcontractors, and other Subcontractors as required by District, productivity calculations common to their trades, such as units per person day, feet of pipe per day per person, feet of wiring per day per person, and similar information.
 - (d) Furnish schedule for Contractor/Subcontractor CPM schedule meetings which shall be held prior to submission of Original CPM schedule to District. District shall be permitted to attend scheduled meetings as an observer.
- (17) Activity durations shall be in Work days.
- (18) Submit with the schedule a list of anticipated non-Work days, such as weekends and holidays. The Progress Schedule shall exclude in its Work day calendar all non-Work days on which Contractor anticipates critical Work will not be performed.
- C. Original CPM Schedule Review Meeting: Contractor shall, within sixty (60) days from the Notice to Proceed date, meet with District to review the Original CPM Schedule submittal.
 - (1) Contractor shall have its Project Manager, Project Superintendent, Project Scheduler, and key Subcontractor representatives, as required by District, in attendance. The meeting will take place over a continuous one (1) day period.
 - (2) District's review will be limited to submittal's conformance to Contract requirements including, but not limited to, coordination requirements. However, review may also include:
 - (a) Clarifications of Contract Requirements.
 - (b) Directions to include activities and information missing from submittal.
 - (c) Requests to Contractor to clarify its schedule.

- (3) Within five (5) days of the Schedule Review Meeting, Contractor shall respond in writing to all questions and comments expressed by District at the Meeting.

1.08 ADJUSTMENTS TO CPM SCHEDULE

- A. Adjustments to Original CPM Schedule: Contractor shall have adjusted the Original CPM Schedule submittal to address all review comments from original CPM Schedule review meeting and resubmit network diagrams and reports for District's review.
 - (1) District, within ten (10) days from date that Contractor submitted the revised schedule, will either:
 - (a) Accept schedule and cost and resource loaded activities as submitted, or
 - (b) Advise Contractor in writing to review any part or parts of schedule which either do not meet Contract requirements or are unsatisfactory for District to monitor Project's progress, resources, and status or evaluate monthly payment request by Contractor.
 - (2) District may accept schedule with conditions that the first monthly CPM Schedule update be revised to correct deficiencies identified.
 - (3) When schedule is accepted, it shall be considered the "Original CPM Schedule" which will then be immediately updated to reflect the current status of the work.
 - (4) District reserves right to require Contractor to adjust, add to, or clarify any portion of schedule which may later be discovered to be insufficient for monitoring of Work or approval of partial payment requests. No additional compensation will be provided for such adjustments, additions, or clarifications.
- B. Acceptance of Contractor's schedule by District will be based solely upon schedule's compliance with Contract requirements.
 - (1) By way of Contractor assigning activity durations and proposing sequence of Work, Contractor agrees to utilize sufficient and necessary management and other resources to perform work in accordance with the schedule.
 - (2) Upon submittal of schedule update, updated schedule shall be considered "current" CPM Schedule.
 - (3) Submission of Contractor's schedule to District shall not relieve Contractor of total responsibility for scheduling, sequencing, and pursuing Work to comply with requirements of Contract Documents, including adverse effects such as delays resulting from ill-timed Work.

- C. Submittal of Original CPM Schedule, and subsequent schedule updates, shall be understood to be Contractor's representation that the Schedule meets requirements of Contract Documents and that Work shall be executed in sequence indicated on the schedule.
- D. Contractor shall distribute Original CPM Schedule to Subcontractors for review and written acceptance, which shall be noted on Subcontractors' letterheads to Contractor and transmitted to District for the record.

1.09 MONTHLY CPM SCHEDULE UPDATE SUBMITTALS

- A. Following acceptance of Contractor's Original CPM Schedule, Contractor shall monitor progress of Work and adjust schedule each month to reflect actual progress and any anticipated changes to planned activities.
 - (1) Each schedule update submitted shall be complete, including all information requested for the Original CPM Schedule submittal.
 - (2) Each update shall continue to show all Work activities including those already completed. These completed activities shall accurately reflect "as built" information by indicating when activities were actually started and completed.
- B. A meeting will be held on approximately the twenty-fifth (25th) of each month to review the schedule update submittal and progress payment application.
 - (1) At this meeting, at a minimum, the following items will be reviewed: Percent (%) complete of each activity; Time Impact Evaluations for Change Orders and Time Extension Request; actual and anticipated activity sequence changes; actual and anticipated duration changes; and actual and anticipated Contractor delays.
 - (2) These meetings are considered a critical component of overall monthly schedule update submittal and Contractor shall have appropriate personnel attend. At a minimum, these meetings shall be attended by Contractor's General Superintendent and Scheduler.
 - (3) Contractor shall plan on the meeting taking no less than four (4) hours.
- C. Within five (5) working days after monthly schedule update meeting, Contractor shall submit the updated CPM Schedule update.
- D. Within five (5) work days of receipt of above noted revised submittals, District will either accept or reject monthly schedule update submittal.
 - (1) If accepted, percent (%) complete shown in monthly update will be basis for Application for Payment by the Contractor. The schedule update shall be submitted as part of the Contractor's Application for Payment.

- (2) If rejected, update shall be corrected and resubmitted by Contractor before the Application for Payment is submitted.
- E. Neither updating, changing or revising of any report, curve, schedule, or narrative submitted to District by Contractor under this Contract, nor District's review or acceptance of any such report, curve, schedule or narrative shall have the effect of amending or modifying in any way the Completion Date or milestone dates or of modifying or limiting in any way Contractor's obligations under this Contract.

1.10 SCHEDULE REVISIONS

- A. Updating the Schedule to reflect actual progress shall not be considered revisions to the Schedule. Since scheduling is a dynamic process, revisions to activity durations and sequences are expected on a monthly basis.
- B. To reflect revisions to the Schedule, the Contractor shall provide District with a written narrative with a full description and reasons for each Work activity revised. For revisions affecting the sequence of work, the Contractor shall provide a schedule diagram which compares the original sequence to the revised sequence of work. The Contractor shall provide the written narrative and schedule diagram for revisions two (2) working days in advance of the monthly schedule update meeting.
- C. Schedule revisions shall not be incorporated into any schedule update until the revisions have been reviewed by District. District may request further information and justification for schedule revisions and Contractor shall, within three (3) days, provide District with a complete written narrative response to District's request.
- D. If the Contractor's revision is still not accepted by District, and the Contractor disagrees with District's position, the Contractor has seven (7) calendar days from receipt of District's letter rejecting the revision to provide a written narrative providing full justification and explanation for the revision. The Contractor's failure to respond in writing within seven (7) calendar days of District's written rejection of a schedule revision shall be contractually interpreted as acceptance of District's position, and the Contractor waives its rights to subsequently dispute or file a claim regarding District's position.
- E. At District's discretion, the Contractor can be required to provide Subcontractor certifications of performance regarding proposed schedule revisions affecting said Subcontractors.

1.11 RECOVERY SCHEDULE

- A. If the Schedule Update shows a completion date twenty-one (21) calendar days beyond the Contract Completion Date, or individual milestone completion dates, the Contractor shall submit to District the proposed revisions to recover the lost time within seven (7) calendar days. As part of this submittal, the Contractor shall provide a written narrative for each revision made to recapture the lost time. If the revisions include sequence changes, the Contractor shall provide a schedule diagram comparing the original sequence to the revised sequence of work.

- B. The revisions shall not be incorporated into any schedule update until the revisions have been reviewed by District.
- C. If the Contractor's revisions are not accepted by District, District and the Contractor shall follow the procedures in paragraph 1.09.C, 1.09.D and 1.09.E above.
- D. At District's discretion, the Contractor can be required to provide Subcontractor certifications for revisions affecting said Subcontractors.

1.12 TIME IMPACT EVALUATION ("TIE") FOR CHANGE ORDERS, AND OTHER DELAYS

- A. When Contractor is directed to proceed with changed Work, the Contractor shall prepare and submit within fourteen (14) calendar days from the Notice to Proceed a TIE which includes both a written narrative and a schedule diagram depicting how the changed Work affects other schedule activities. The schedule diagram shall show how the Contractor proposes to incorporate the changed Work in the schedule and how it impacts the current schedule-update critical path. The Contractor is also responsible for requesting time extensions based on the TIE's impact on the critical path. The diagram must be tied to the main sequence of schedule activities to enable District to evaluate the impact of changed Work to the scheduled critical path.
- B. Contractor shall be required to comply with the requirements of Paragraph 1.09.A for all types of delays such as, but not limited to, Contractor/Subcontractor delays, adverse weather delays, strikes, procurement delays, fabrication delays, etc.
- C. Contractor shall be responsible for all costs associated with the preparation of TIEs, and the process of incorporating them into the current schedule update. The Contractor shall provide District with four (4) copies of each TIE.
- D. Once agreement has been reached on a TIE, the Contract Time will be adjusted accordingly. If agreement is not reached on a TIE, the Contract Time may be extended in an amount District allows, and the Contractor may submit a claim for additional time claimed by contractor.

1.13 TIME EXTENSIONS

- A. The Contractor is responsible for requesting time extensions for time impacts that, in the opinion of the Contractor, impact the critical path of the current schedule update. Notice of time impacts shall be given in accord with the General Conditions.
- B. Where an event for which District is responsible impacts the projected Completion Date, the Contractor shall provide a written mitigation plan, including a schedule diagram, which explains how (e.g., increase crew size, overtime, etc.) the impact can be mitigated. The Contractor shall also include a detailed cost breakdown of the labor, equipment, and material the Contractor would expend to mitigate District-caused time impact. The Contractor shall submit its mitigation plan to District within fourteen (14)

calendar days from the date of discovery of the impact. The Contractor is responsible for the cost to prepare the mitigation plan.

- C. Failure to request time, provide TIE, or provide the required mitigation plan will result in Contractor waiving its right to a time extension and cost to mitigate the delay.
- D. No time will be granted under this Contract for cumulative effect of changes.
- E. District will not be obligated to consider any time extension request unless the Contractor complies with the requirements of Contract Documents.
- F. Failure of the Contractor to perform in accordance with the current schedule update shall not be excused by submittal of time extension requests.
- G. If the Contractor does not submit a TIE within the required fourteen (14) calendar days for any issue, it is mutually agreed that the Contractor does not require a time extension for said issue.

1.14 SCHEDULE REPORTS

- A. Submit four (4) copies of the following reports with the Initial CPM Schedule, the Original CPM Schedule, and each monthly update.
- B. Required Reports:
 - (1) Two activity listing reports: one sorted by activity number and one by total Project Float. These reports shall also include each activity's early/late and actual start and finish dates, original and remaining duration, Project Float, responsibility code, and the logic relationship of activities.
 - (2) Cost report sorted by activity number including each activity's associated cost, percentage of Work accomplished, earned value- to date, previous payments, and amount earned for current update period.
 - (3) Schedule plots presenting time-scaled network diagram showing activities and their relationships with the controlling operations or critical path clearly highlighted.
 - (4) Cash flow report calculated by early start, late start, and indicating actual progress. Provide an exhibit depicting this information in graphic form.
 - (5) Planned versus actual resource (i.e., labor) histogram calculated by early start and late start.
- C. Other Reports:

In addition to above reports, District may request, from month to month, any two of the following reports. Submit four (4) copies of all reports.

- (1) Activities by early start.
 - (2) Activities by late start.
 - (3) Activities grouped by Subcontractors or selected trades.
 - (4) Activities with scheduled early start dates in a given time frame, such as fifteen (15) or thirty (30) day outlook.
- D. Furnish District with report files on compact disks containing all schedule files for each report generated.

1.15 PROJECT STATUS REPORTING

- A. In addition to submittal requirements for CPM scheduling identified in this Section, Contractor shall provide a monthly project status report (i.e., written narrative report) to be submitted in conjunction with each CPM Schedule as specified herein. Status reporting shall be in form specified below.
- B. Contractor shall prepare monthly written narrative reports of status of Project for submission to District. Written status reports shall include:
- (1) Status of major Project components (percent (%) complete, amount of time ahead or behind schedule) and an explanation of how Project will be brought back on schedule if delays have occurred.
 - (2) Progress made on critical activities indicated on CPM Schedule.
 - (3) Explanations for any lack of work on critical path activities planned to be performed during last month.
 - (4) Explanations for any schedule changes, including changes to logic or to activity durations.
 - (5) List of critical activities scheduled to be performed next month.
 - (6) Status of major material and equipment procurement.
 - (7) Any delays encountered during reporting period.
 - (8) Contractor shall provide printed report indicating actual versus planned resource loading for each trade and each activity. This report shall be provided on weekly and monthly basis.
 - (a) Actual resource shall be accumulated in field by Contractor, and shall be as noted on Contractor's daily reports. These reports will be basis for information provided in computer-generated monthly and weekly printed reports.
 - (b) Contractor shall explain all variances and mitigation measures.

- (9) Contractor may include any other information pertinent to status of Project. Contractor shall include additional status information requested by District at no additional cost.
- (10) Status reports, and the information contained therein, shall not be construed as claims, notice of claims, notice of delay, or requests for changes or compensation.

1.16 WEEKLY SCHEDULE REPORT

At the Weekly Progress Meeting, the Contractor shall provide and present a time-scaled three (3) week look-ahead schedule that is based and correlated by activity number to the current schedule (i.e., Initial, Original CPM, or Schedule Update).

1.17 DAILY CONSTRUCTION REPORTS

On a daily basis, Contractor shall submit a daily activity report to District for each workday, including weekends and holidays when worked. Contractor shall develop the daily construction reports on a computer-generated database capable of sorting daily Work, manpower, and man-hours by Contractor, Subcontractor, area, sub-area, and Change Order Work. Upon request of District, furnish computer disk of this data base. Obtain District's written approval of daily construction report data base format prior to implementation. Include in report:

- A. Project name and Project number.
- B. Contractor's name and address.
- C. Weather, temperature, and any unusual site conditions.
- D. Brief description and location of the day's scheduled activities and any special problems and accidents, including Work of Subcontractors. Descriptions shall be referenced to CPM scheduled activities.
- E. Worker quantities for its own Work force and for Subcontractors of any tier.
- F. Equipment, other than hand tools, utilized by Contractor and Subcontractors.

1.18 PERIODIC VERIFIED REPORTS

Contractor shall complete and verify construction reports on a form prescribed by the Division of the State Architect and file reports on the first day of February, May, August, and November during the preceding quarter year; at the completion of the Contract; at the completion of the Work; at the suspension of Work for a period of more than one (1) month; whenever the services of Contractor or any of Contractor's Subcontractors are terminated for any reason; and at any time a special verified report is required by the Division of the State Architect. Refer to section 4-336 and section 4-343 of Part 1, Title 24 of the California Code of Regulations.

PART 2 – PRODUCTS Not Used.

PART 3 - EXECUTION Not Used.

END OF DOCUMENT

SUBMITTALS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Contractor's Submittals and Schedules, Drawings and Specifications;
- B. Special Conditions.

1.02 SECTION INCLUDES:

- A. Definitions:
 - (1) Shop Drawings and Product Data are as indicated in the General Conditions and include, but are not limited to, fabrication, erection, layout and setting drawings, formwork and falsework drawings, manufacturers' standard drawings, descriptive literature, catalogues, brochures, performance and test data, wiring and control diagrams. In addition, there are other drawings and descriptive data pertaining to materials, equipment, piping, duct and conduit systems, and methods of construction as may be required to show that the materials, equipment or systems and all positions conform to the requirement of the Contract Documents, including, without limitation, the Drawings.
 - (2) "Manufactured" applies to standard units usually mass-produced; "fabricated" means specifically assembled or made out of selected materials to meet design requirements. Shop Drawings shall establish the actual detail of manufactured or fabricated items, indicated proper relation to adjoining work and amplify design details of mechanical and electrical equipment in proper relation to physical spaces in the structure.
 - (3) Manufacturer's Instructions: Where any item of Work is required by the Contract Documents to be furnished, installed, or performed, at a minimum, in accordance with a specified product manufacturer's instructions, the Contractor shall procure and distribute copies of these to the District, the Architect, and all other concerned parties and shall furnish, install, or perform the work, at a minimum, in accordance with those instructions.
- B. Samples, Shop Drawings, Product Data, and other items as specified, in accordance with the following requirements:
 - (1) Contractor shall submit all Shop Drawings, Product Data, and Samples to the District, the Architect, the Project Inspector, and the Construction Manager.

Contractor to review section
01 3300 as well as this
document

- (2) Contractor shall comply with all time frames herein and in the General Conditions and, in any case, shall submit required information in sufficient time to permit proper consideration and action before ordering any materials or items represented by such Shop Drawings, Product Data, and/or Samples.
- (3) Contractor shall allow sufficient time so that no delay occurs due to required lead time in ordering or delivery of any item to the Site. Contractor shall be responsible for any delay in progress of Work due to its failure to observe these requirements.
- (4) Time for completion of Work shall not be extended on account of Contractor's failure to promptly submit Shop Drawings, Product Data, and/or Samples.
- (5) Reference numbers on Shop Drawings shall have Architectural and/or Engineering Contract Drawings reference numbers for details, sections, and "cuts" shown on Shop Drawings. These reference numbers shall be in addition to any numbering system that Contractor chooses to use or has adopted as standard.
- (6) When the magnitude or complexity of submittal material prevents a complete review within the stated time frame, Contractor shall make this submittal in increments to avoid extended delays.
- (7) Contractor shall certify on submittals for review that submittals conform to Contract requirements. Also certify that Contractor-furnished equipment can be installed in allocated space. In event of any variance, Contractor shall specifically state in transmittal and on Shop Drawings, portions vary and require approval of a substitute. Submittals shall not be used as a means of requesting a substitution.
- (8) Unless specified otherwise, sampling, preparation of samples, and tests shall be in accordance with the latest standard of the American Society for Testing and Materials.
- (9) Upon demand by Architect or District, Contractor shall submit samples of materials and/or articles for tests or examinations and consideration before Contractor incorporates same in Work. Contractor shall be solely responsible for delays due to sample(s) not being submitted in time to allow for tests. Acceptance or rejection will be expressed in writing. Work shall be equal to approved samples in every respect. Samples that are of value after testing will remain the property of Contractor.

C. Submittal Schedule:

- (1) Contractor shall prepare its proposed submittal schedule that is coordinated with the proposed construction schedule and submit both to the District within ten (10) days after the date of the Notice to Proceed. Contractor's proposed schedules shall become the Project Construction Schedule and the Project Submittal Schedule after each is approved by the District.

Contractor to review section
01 3300 as well as this
document

- (2) Contractor is responsible for all lost time should the initial submittal be rejected, marked "revise and resubmit", etc.
- (3) All Submittals shall be forwarded to the District by the date indicated on the approved Submittal Schedule, unless an earlier date is necessary to maintain the Construction Schedule, in which case those Submittals shall be forwarded to the District so as not to delay the Construction Schedule.
- (4) Contractor may be assessed \$100 a day for each day it is late in submitting a shop drawing or sample. No extensions of time will be granted to Trade Contractor or any Subcontractor because of its failure to have shop drawings and samples submitted in accordance with the Schedule.

1.03 SHOP DRAWINGS:

- A. Contractor shall submit one reproducible transparency and six (6) opaque reproductions. The District will review and return the reproducible copy and one (1) opaque reproduction to Contractor.
- B. Before commencing installation of any Work, the Contractor shall submit and receive approval of all drawings, descriptive data, and material list(s) as required to accomplish Work.
- C. Review of Shop Drawings is regarded as a service to assist Contractor and in all cases original Contract Documents shall take precedence as outlined under General Conditions.
- D. No claim for extra time or payment shall be based on work shown on Shop Drawings unless the claim is (1) noted on Contractor's transmittal letter accompanying Shop Drawings and (2) Contractor has complied with all applicable provisions of the General Conditions, including, without limitation, provisions regarding changes and payment, and all required written approvals.
- E. District shall not review Shop Drawings for quantities of materials or number of items supplied.
- F. District's and/or Architect's review of Shop Drawing will be general. District and/or Architect review does not relieve Contractor of responsibility for dimensions, accuracy, proper fitting, construction of Work, furnishing of materials, or Work required by Contract Documents and not indicated on Shop Drawings. The District's and/or Architect's review of Shop Drawings is not to be construed as approving departures from Contract Documents.
- G. Review of Shop Drawings and Schedules does not relieve Contractor from responsibility for any aspect of those Drawings or Schedules that is a violation of local, County, State, or Federal laws, rules, ordinances, or rules and regulations of commissions, boards, or other authorities or utilities having jurisdiction.
- H. Before submitting Shop Drawings for review, Contractor shall check Shop Drawings of its subcontractors for accuracy, and confirm that all Work

Contractor to review section
01 3300 as well as this
document

contiguous with and having bearing on other work shown on Shop Drawings is accurately drawn and in conformance with Contract Documents.

- I. Submitted drawings and details must bear stamp of approval of Contractor:
 - (1) Stamp and signature shall clearly certify that Contractor has checked Shop Drawings for compliance with Drawings.
 - (2) If Contractor submits a Shop Drawing without an executed stamp of approval, or whenever it is evident (despite stamp) that Drawings have not been checked, the District and/or Architect will not consider them and will return them to the Contractor for revision and resubmission. In that event, it will be deemed that Contractor has not complied with this provision and Contractor shall bear risk of all delays to same extent as if it had not submitted any Shop Drawings or details.
- J. Submission of Shop Drawings (in either original submission or when resubmitted with correction) constitutes evidence that Contractor has checked all information thereon and that it accepts and is willing to perform Work as shown.
- K. Contractor shall pay for cost of any changes in construction due to improper checking and coordination. Contractor shall be responsible for all additional costs, including coordination. Contractor shall be responsible for costs incurred by itself, the District, the Architect, the Project Inspector, the Construction Manager, any other Subcontractor or contractor, etc., due to improperly checked and/or coordination of submittals.
- L. Shop Drawings must clearly delineate the following information:
 - (1) Project name and address.
 - (2) Specification number and description.
 - (3) Architect's name and project number.
 - (4) Shop Drawing title, number, date, and scale.
 - (5) Names of Contractor, Subcontractor(s) and fabricator.
 - (6) Working and erection dimensions.
 - (7) Arrangements and sectional views.
 - (8) Necessary details, including complete information for making connections with other Work.
 - (9) Kinds of materials and finishes.
 - (10) Descriptive names of materials and equipment, classified item numbers, and locations at which materials or equipment are to be installed in the Work. Contractor shall use same reference identification(s) as shown on Contract Drawings.

Contractor to review section
01 3300 as well as this
document

- M. Contractor shall prepare composite drawings and installation layouts when required to solve tight field conditions.
 - (1) Shop Drawings shall consist of dimensioned plans and elevations and must give complete information, particularly as to size and location of sleeves, inserts, attachments, openings, conduits, ducts, boxes, structural interferences, etc.
 - (2) Contractor shall coordinate these composite Shop Drawings and installation layouts in the field between itself and its Subcontractor(s) for proper relationship to the Work, the work of other trades, and the field conditions. The Contractor shall check and approve all submittal(s) before submitting them for final review.

1.04 PRODUCT DATA OR NON REPRODUCIBLE SUBMITTALS:

- A. Contractor shall submit manufacturer's printed literature in original form. Any fading type of reproduction will not be accepted. Contractor must submit a minimum of six (6) each, to the District. District shall return one (1) to the Contractor, who shall reproduce whatever additional copies it requires for distribution.
- B. Contractor shall submit six (6) copies of a complete list of all major items of mechanical, plumbing, and electrical equipment and materials in accordance with the approved Submittal Schedule, except as required earlier to comply with the approved Construction Schedule. Other items specified are to be submitted prior to commencing Work. Contractor shall submit items of like kind at one time in a neat and orderly manner. Partial lists will not be acceptable.
- C. Submittals shall include manufacturer's specifications, physical dimensions, and ratings of all equipment. Contractor shall furnish performance curves for all pumps and fans. Where printed literature describes items in addition to that item being submitted, submitted item shall be clearly marked on sheet and superfluous information shall be crossed out. If highlighting is used, Contractor shall mark all copies.
- D. Equipment submittals shall be complete and include space requirements, weight, electrical and mechanical requirements, performance data, and supplemental information that may be requested.
- E. Imported Materials Certification must be submitted at least ten (10) days before material is delivered.

1.05 SAMPLES:

- A. Contractor shall submit for approval Samples as required and within the time frame in the Contract Documents. Materials such as concrete, mortar, etc., which require on-site testing will be obtained from Project Site.
- B. Contractor shall submit four (4) samples except where greater or lesser number is specifically required by Contract Documents including, without limitation, the Specifications.

Contractor to review section
01 3300 as well as this
document

- (1) Samples must be of sufficient size and quality to clearly illustrate functional characteristics, with integrally related parts and attachment devices.
 - (2) Samples must show full range of texture, color, and pattern.
- C. Contractor shall make all Submittals, unless it has authorized Subcontractor(s) to submit and Contractor has notified the District in writing to this effect.
- D. Samples to be shipped prepaid or hand-delivered to the District.
- E. Contractor shall mark samples to show name of Project, name of Contractor submitting, Contract number and segment of Work where representative Sample will be used, all applicable Specifications Sections and documents, Contract Drawing Number and detail, and ASTM or FS reference, if applicable.
- F. Contractor shall not deliver any material to Site prior to receipt of District's and/or Architect's completed written review and approval. Contractor shall furnish materials equal in every respect to approved Samples and execute Work in conformance therewith.
- G. District's and/or Architect's review, acceptance, and/or approval of Sample(s) will not preclude rejections of any material upon discovery of defects in same prior to final acceptance of completed Work.
- H. After a material has been approved, no change in brand or make will be permitted.
- I. Contractor shall prepare its Submittal Schedule and submit Samples of materials requiring laboratory tests to specified laboratory for testing not less than ninety (90) days before such materials are required to be used in Work.
- J. Samples which are rejected must be resubmitted promptly after notification of rejection and be marked "Resubmitted Sample" in addition to other information required.
- K. Field Samples and Mock-Ups are to be removed by Contractor at District's direction:
 - (1) Size: As Specified.
 - (2) Furnish catalog numbers and similar data, as requested.

1.06 REVIEW AND RESUBMISSION REQUIREMENTS:

- A. The District will arrange for review of Sample(s), Shop Drawing(s), Product Data, and other submittal(s) by appropriate reviewer and return to Contractor as provided below within twenty-one (21) days after receipt or within twenty-one (21) days after receipt of all related information necessary for such review, whichever is later.
- B. One (1) copy of product or materials data will be returned to Contractor with the review status.

Contractor to review section
01 3300 as well as this
document

- C. Samples to be incorporated into the Work will be returned to Contractor, together with a written notice designating the Sample with the appropriate review status and indicating errors discovered on review, if any. Other Samples will not be returned, but the same notice will be given with respect thereto, and that notice shall be considered a return of the Sample.
- D. Contractor shall revise and resubmit any Sample(s), Shop Drawing(s), Product Data, and other submittal(s) as required by the reviewer. Such resubmittals will be reviewed and returned in the same manner as original Sample(s), Shop Drawing(s), Product Data, and other submittal(s), within fourteen (14) days after receipt thereof or within fourteen (14) days after receipt of all related information necessary for such review. Such resubmittal shall not delay the Work.
- E. Contractor may proceed with any of the Work covered by Sample(s), Shop Drawing(s), Product Data, and other submittal(s) upon its return if designated as no exception taken, or revise as noted, provided the Contractor proceeds in accordance with the District and/or the Architect's notes and comments.
- F. Contractor shall not begin any of the work covered by a Sample(s), Shop Drawing(s), Product Data, and other submittal(s), designated as revise and resubmit or rejected, until a revision or correction thereof has been reviewed and returned to Contractor.
- G. Sample(s), Shop Drawing(s), Product Data, and other submittal(s) designated as revise and resubmit or rejected and requiring resubmittal, shall be revised or corrected and resubmitted to the District no later than fourteen (14) days or a shorter period as required to comply with the approved Construction Schedule, after its return to Contractor.
- H. Neither the review nor the lack of review of any Sample(s), Shop Drawing(s), Product Data, and other submittal(s) shall waive any of the requirements of the Contract Documents, or relieve Contractor of any obligation thereunder.
- I. District's and/or Architect's review of Shop Drawings does not relieve the Contractor of responsibility for any errors that may exist. Contractor is responsible for the dimensions and design of adequate connections and details and for satisfactory construction of all the Work.

PART 2 – PRODUCTS Not Used.

PART 3 - EXECUTION Not Used.

END OF DOCUMENT

Wanda Hirsch ES TK Portable Classroom Bldg
Tracy Unified School District

SUBMITTAL NO.:

Architect's Project # 3595001
DSA File/Apl. # 39-73/122128

DATE: _____
Re-Submittal of Original No.: _____

1. SUBMITTAL TRANSMITTAL

Attention: Affifa Kadhim

Contractor: Company

Contact: Name _____

Sub Contractor:

Contact: _____



Please submit only one trade per submittal! Description of submitted materials:

Quantity submitted	Specification Section		Description of contents (e.g. product data, shop drawings, samples)
	Section #	Section Title	

Contractor Statement: (read and acknowledge)

This submittal has been reviewed and approved with respect to the means, methods, techniques, and procedures of construction, safety precautions, and program incidentals thereto. This submittal complies with the contract documents and comprises no variations thereto, unless accompanied by a substitution request.

By: _____
Name

Date: _____

2. RE-TRANSMITTAL TO CONTRACTOR:

Distribution: Contractor, Owner, Project Inspector, RGA, Other

- ☐ NO EXCEPTIONS TAKEN
☐ SUBMIT SPECIFIED ITEM

- ☐ REJECTED
☐ REVISE AND RESUBMIT

- ☐ FURNISH AS CORRECTED
☐ NO ACTION REQUIRED

Corrections or comments made on the shop drawings during this review do not relieve the Contractor from compliance with requirements of the Drawings and Specifications. This general check is only for the review of conformance with the design concept of the project and general compliance with the information given in the Contract Documents. The Contractor is responsible for confirming and correlating all quantities and dimensions, selecting fabrication processes and techniques of construction, coordinating his work with that of all the other trades, and performing his work in a safe and satisfactory manner.

Rainforth Grau Architects

By: _____ Date: _____

Additional Comments:

See Specification Section 01 3300 for use of this form

Wanda Hirsch ES TK Portable Classroom Bldg
Tracy Unified School District

**SUBSTITUTION
REQUEST NO.:**

Architect's Project # 3595001
DSA File/Appl. # 39-73/122128

Date: _____

1. SUBSTITUTION REQUEST

Attention: Affifa Kadhim

Contractor: Company _____

Contact: Name _____



Please submit only one product per request!

Sub Contractor: _____

Include with a specified product Submittal

Contact: _____

2. PROPOSED SUBSTITUTIONS: The undersigned requests consideration of the following substitution:

Specified Item: _____ Page No.: _____ Paragraph No.: _____

Proposed Item: _____

3. REASON FOR REQUEST:

4. REQUIREMENTS FOR SUBSTITUTIONS:

Attached data includes product description, specifications, drawings, photographs, performance and test data adequate for evaluation of request; applicable portions of data are clearly identified. Attached data also includes a description of changes to Contract Documents, which proposed substitution will require for its proper installation.

The undersigned certifies that the following paragraphs, unless modified by attachments, are correct:

1. The proposed substitution does not affect dimensions shown on drawings and does not require design changes in the Contract Documents.
2. The undersigned will pay for changes to the building design, including engineering design, detailing and construction costs caused by the requested substitution.
3. The proposed substitution will have no adverse effect on the work, the schedule or specified warranty requirements.
4. Maintenance and service parts will be readily available for the proposed substitution.

The undersigned further states that the function, appearance and quality of the proposed substitution are equivalent or superior to the specified item.

Signature - Contractor/Subcontractor

Date

5. TRANSMITTAL TO CONTRACTOR:

Distribution: Contractor, Owner, Project Inspector, RGA, Other

☐ **ACCEPTED**

☐ **ACCEPTED AS NOTED**

☐ **REJECTED**

Rainforth Grau Architects

By: _____

Date: _____

Comments:

Wanda Hirsch ES TK Portable Classroom Bldg
Tracy Unified School District

RFI NO.:

Architect's Project # 3595001
DSA File/Apl. # 39-73/122128

Date: _____

1. REQUEST FOR INFORMATION

Attention: Affifa Kadhim

From:

Contractor:

Company

Contact:

Name

Sub Contractor:

Contact:



Identify related specific references within the Contract Documents and supporting information:

Dwg./Document No.: _____

Building/Site Location: _____

2. Existing Condition (source / reason for the request):

3. Recommended Contractor Action(s) for resolution:

4. Project Inspector Acknowledgment:

Date Reviewed: _____

5. Owner / A/E Resolution(s):

Date of Response: _____ By: _____

Attachments: _____

Extra Work Involved in the Above Described Change?

Yes ☐

No ☐

Distribution: Contractor, Owner, Project Inspector, RGA, Other
See Specification Section 01300 for use of this form

Wanda Hirsch ES TK Portable Classroom Bldg
Tracy Unified School District

**E-DATA
REQUEST NO.:**

Architect's Project # 3595001
DSA File/Appl. # 39-73/122128

Date: _____

1. ELECTRONIC DATA REQUEST

Attention: Affifa Kadhim

From: Contractor: Company

Contact: Name

Sub Contractor:

Contact: _____



2. DATA REQUESTED - Provide list of specific drawings requested (include sheet numbers):

3. REASON FOR REQUEST - Provide clear explanation of why information is desired and for what purpose it will be utilized:

4. ACKNOWLEDGEMENT OF RESPONSIBILITY:

The electronic data files requested are distributed for reference only. Transferring such files can alter, delete or change original information. Accuracy of the data cannot be guaranteed as correct or complete and the Contractor accepts full responsibility for any and all inaccuracies, regardless of cause.

The hard copy documents, including addenda and subsequent written changes to the documents, represent the complete work of the contract and all electronic files should be cross-referenced and verified from that information as electronic files may not contain all contract information. It is the Contractor's responsibility to make any changes or revisions necessary.

This electronic data is furnished without guarantee of compatibility with your hardware or software. It is the Contractor's responsibility to notify the Architect in the event a compatibility problem or disk defect is encountered and a replacement disk is necessary.

This electronic data, in its present form, remains the property of Rainforth Grau Architects and shall not be used for any other purpose than to provide background information for the project noted above. It is not to be released to any other party without the written consent of Rainforth Grau Architects.

Accepted by: _____
Signature - Contractor/Subcontractor

Representing: _____
Contractor/Subcontractor Company Name

MEGGER GROUNDING TEST CERTIFICATE

This certifies that a Megger Grounding Test for the **Wanda Hirsch Elementary School - TK Portable Classroom Building** for the **Tracy Unified** School District, of **San Joaquin** County, California was conducted on the _____ day of _____, **2024**, per CCR Title 24, Sections 200 H and J. The undersigned verifies that the resistance to ground was 25 ohms or less, as required, and is found to be acceptable.

Project Name: _____

DSA File No.: _____ DSA Application No.: _____

Address: _____

General Contractor's Signature: _____

Electrical Contractor's Signature: _____

Testing Agency's Signature: _____

District Inspector's Signature: _____

SEPARATE CERTIFICATE IS REQUIRED FOR EACH SITE

CERTIFICATION OF CHLORINATION AND STERILIZATION

This certifies that _____ chlorinated the domestic hot and cold water plumbing lines for the **Wanda Hirsch Elementary School - TK Portable Classroom Building, Tracy Unified** School District. The lines were first flushed and chlorine was injected in the main water line on _____, **2024**. A minimum chlorine residual of 50 ppm was measured at each outlet. The lines were tagged, secured and the make-up water was shut off. On _____, **2024**, (a minimum of 24 hours later) the chlorine residual was retested and found to contain a minimum of 50 ppm. The plumbing lines were then thoroughly flushed with fresh water until the chlorine residual was not greater than 0.2 ppm at all outlets. A Bacteriological Examination report has been provided.

District Inspector Signature: _____

Date _____

Name of Chlorination and Testing Firm: _____

Authorized Representative Signature: _____

Date _____

Name of General Contractor: _____

Authorized Representative Signature: _____

Date _____

CERTIFICATION OF COMPLIANCE FOR BUILDING MATERIALS

This is to certify, in accordance with the Environmental Protection Agency requirements, that the materials and equipment used in the construction of the **Wanda Hirsch Elementary School - TK Portable Classroom Building** for the **Tracy Unified** School District of **San Joaquin** County, California, are asbestos free and are, therefore, not subject to monitoring for asbestos contamination.

Project Name: _____

Address: _____

Contractor: _____

Address: _____

Signature: _____

Title: _____

Date: _____

SEPARATE CERTIFICATE IS REQUIRED FOR EACH SITE

SITE STANDARDS

PART 1 – GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including without limitation, Site Access, Conditions, and Regulations;
- B. Special Conditions;
- C. Drug-Free Workplace Certification;
- D. Tobacco-Free Environment Certification;
- E. Criminal Background Investigation/Fingerprinting Certification;
- F. Temporary Facilities and Controls.

1.02 REQUIREMENTS OF THE DISTRICT:

- A. Drug-Free Schools and Safety Requirements:
 - (1) All school sites and other District Facilities have been declared "Drug-Free Zones." No drugs, alcohol and/or smoking are allowed at any time in any buildings and/or grounds on District property. No students, staff, visitors, or contractors are to use drugs on these sites.
 - (2) Smoking and the use of tobacco products by all persons is prohibited on or in District property. District property includes school buildings, school grounds, school-owned vehicles and vehicles owned by others while on District property. Contractor shall post: "Non-Smoking Area" in a highly visible location in each work area, staging area, and parking area. Contractor may designate a smoking area outside of District property within the public right-of-way, provided that this area remains quiet and unobtrusive to adjacent neighbors. This smoking area is to be kept clean at all times.
 - (3) Contractor shall ensure that no alcohol, firearms, weapons, or controlled substances enter or are used at the Site. Contractor shall immediately remove from the Site and terminate the employment of any employee(s) found in violation of this provision.
- B. Language: Profanity or other unacceptable and/or loud language will not be tolerated, "Cat calls" or other derogatory language toward students, staff, volunteers, parents or public will not be allowed.

C. Disturbing the Peace (Noise and Lighting):

- (1) Contractor shall observe the noise ordinance of the Site at all times including, without limitation, all applicable local, city, and/or state laws, ordinances, and/or regulations regarding noise and allowable noise levels.
- (2) The use of radios, etc., shall be controlled to keep all sound at a level that cannot be heard beyond the immediate area of use. District reserves the right to prohibit the use of radios at the Site, except for mobile phones or other handheld communication radios.
- (3) If portable lights are used after dark, all light must be located so as not to direct light into neighboring property.

D. Traffic:

- (1) Driving on the Premises shall be limited to periods when students and public are not present. If driving or deliveries must be made during the school hours, two (2) or more ground guides shall lead the vehicle across the area of travel. In no case shall driving take place across playgrounds or other pedestrian paths during recess, lunch, and/or class period changes. The speed limit on-the Premises shall be five (5) miles per hour (maximum) or less if conditions require.
- (2) All paths of travel for deliveries, including without limitation, material, equipment, and supply deliveries, shall be reviewed and approved by District in advance. Any damage will be repaired to the pre-damaged condition by the Contractor.
- (3) District shall designate a construction entry to the Site. If Contractor requests, District determines it is required, and to the extent possible, District shall designate a staging area so as not to interfere with the normal functioning of school facilities. Location of gates and fencing shall be approved in advance with District and at Contractor's expense.
- (4) Parking areas shall be reviewed and approved by District in advance. No parking is to occur under the drip line of trees or in softscape areas that could otherwise be damaged.

- E. All of the above shall be observed and complied with by the Contractor and all workers on the Site. Failure to follow these directives could result in individual(s) being suspended or removed from the work force at the discretion of the District. The same rules and regulations shall apply equally to delivery personnel, inspectors, consultants, and other visitors to the Site.

PART 2 - PRODUCTS Not Used.

PART 3 - EXECUTION Not Used.

END OF DOCUMENT

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Special environmental, sustainable, and “green” building practices related to indoor air quality, resource efficiency supplementing the Pollutant Control requirements specified under Section 01 8113.10, Sustainable Design Requirements, and to ensure healthy indoor air quality in final Project.
- B. Contractor is required to comply with sustainable building practices during construction and when considering materials for substitutions. Refer to Article “Design Requirements.”

1.2 RELATED REQUIREMENTS

- A. Section 01 6116, Volatile Organic Compound (VOC) Restrictions.
- B. Section 01 50 13, Construction Waste Management and Disposal.
- C. Section 01 8113, Sustainable Design Requirements.

1.3 ADMINISTRATIVE REQUIREMENTS

- A. Submittal Procedures:
 - 1. Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
 - 2. Sustainable Design Submittals shall comply with the additional requirement of Section 01 8113, Sustainable Design Requirements.
 - 3. Closeout Submittals shall be submitted in accordance with document 01 7700, Closeout Procedures.

1.4 DESIGN REQUIREMENTS

- A. Owner has established general environmental goals for design and for construction of the Project.
 - 1. In addition to the Contractor, the Contractor’s construction team, including subcontractors, suppliers, and manufacturers, are encouraged to participate where possible to realize the Owner’s environmental goals.
 - 2. Intent is for environmental goals to be achieved in a manner which ultimately provides a safe and healthy environment for building occupants with minimal impact on the local, regional and global environment.
- B. Environmental Goals:
 - 1. Refer to specific Specifications Sections for more detailed construction requirements related to specific materials and systems.

ENVIRONMENTAL PROCEDURES
SECTION 01 3543
3595001

1.5 INFORMATIONAL SUBMITTALS

A. Indoor Air Quality (IAQ) Data:

1. Environmental Issues: Submit emission test data produced by acceptable testing laboratory, listed in this Specification Article "Quality Assurance," for materials as required in each specific Specification Section.
 - a. Laboratory reports shall contain emissions test data on Volatile Organic Compounds (VOCs) including Total Volatile Organic Compounds (TVOC), specific individual VOCs, formaldehyde and other aldehydes as described in this Section.
 - b. Identify VOCs emitted by each material as required in these Specifications, and demonstrate compliance with the California Green Building Standards Code, edition current as of the date of this Contract.
 - c. Specific test conditions and requirements are set forth in the Specifications. For required tests, submit documentation of sample acquisition, handling, and test specimen preparation, as well as test conditions, methods, and procedures. The tests consist of a 10-day conditioning period followed by a 96-hour test period.
 - 1) Samples collected during the test period at 24, 48, and 96-hours shall be analyzed for TVOC and formaldehyde.
 - 2) VOC samples collected at 96 hours shall be identified and quantified for compounds that are found on the list of Chemicals of Concern. The Chemicals of Concern list is based on the California OEHHA list as of September 2002 (The most recent list shall be used for this Specification as published at:
 - a) http://www.oehha.org/air/chronic_rels/allChrels.html.
2. Cleaning and Maintenance Products: Provide data on manufacturers' recommended maintenance, cleaning, refinishing and disposal procedures for materials and products. These procedures are for final Contractor cleaning of the project prior to Substantial Completion and for provided materials and products as required by the specific Specification Sections.
 - a. Where chemical products are recommended for these procedures, provide documentation to indicate that no component present in the cleaning product at more than 1 percent of the total mass of the cleaning product is a carcinogen or reproductive toxicant as identified in the Chemicals of Concern list referenced above.
 - b. Avoid cleaning products containing alpha-pinene, d-limonene or other unsaturated carbon double bond alkenes due to chemical reactions with ozone to form aldehydes, acidic aerosols, and ultra-fine particulate matter in indoor air.

B. Certificates:

1. Prior to Final Completion, submit a certificate signed by corporate office holder of Contractor, subcontractor, supplier, vendor, installer or manufacturer primarily responsible for the manufacturing of the product, indicating materials provided are

essentially the same, and contain essentially the same components as products and materials tested.

2. Comply with requirements specified in Specification Section 01 7700, Closeout Procedures.

1.6 CLOSEOUT SUBMITTALS

- A. Submit data relating to Environmental Issues.
 1. Submit environmental product certifications, in two forms:
 - a. Two CD-ROMs organized by CSI Division Format.
 - b. Three three-ring binders organized by CSI Division Format with Table of Contents and with dividers for each Division.

1.7 QUALITY ASSURANCE

- A. Environmental Project Management and Coordination: Contractor to identify one person on Contractor's staff to be responsible for environmental issues compliance and coordination.
 1. Experience: Environmental project manager shall have experience relating to sustainable building construction.
 2. Responsibilities: Carefully review the Contract Documents for environmental issues, coordinate work of trades, subcontractors, and suppliers; instruct workers relating to environmental issues; and oversee Project Environmental Goals.
 3. Meetings: Discuss Environmental Goals at following meetings.
 - a. Pre-construction meeting.
 - b. Pre-installation meetings.
 - c. Regularly scheduled job-site meetings.
 - d. Special sustainability issues meetings.
- B. Environmental Issues Criteria: Comply with requirements listed in the Specification Sections.
- C. Acceptable Indoor Air Emissions Testing Laboratories:
 1. Selection of testing laboratories shall include assessment of prior experience in conducting indoor source emissions tests.
 2. The proposed laboratory shall be an independent company or organization not related to the manufacturer of the products to be tested.
 3. Submit documentation on proposed laboratory for review and approval by Owner.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Packaging: Deliver materials in recyclable or in reusable packaging such as cardboard, wood, paper, or reusable blankets, which will be reclaimed by supplier or manufacturer for recycling.

ENVIRONMENTAL PROCEDURES

SECTION 01 3543

3595001

1. Minimize packaging materials to maximum extent possible while still ensuring protection of materials during delivery, storage, and handling.
 2. Unacceptable Packaging Materials: Polyurethane, polyisocyanate, polystyrene, polyethylene, and similar plastic materials such as “foam” plastics and “shrink-fit” plastics.
 3. Reusable Blankets: Deliver and store materials in reusable blankets and mats reclaimed by the manufacturers or suppliers for reuse where the reclamation program exists or where a program can be developed for such reuse.
 4. Pallets: Where pallets are used, suppliers shall be responsible to ensure pallets are removed from site for reuse or for recycling.
 5. Corrugated Cardboard and Paper: Where paper products are used, recycle as part of the construction waste management recycling program, or return to the material’s manufacturer for use by the manufacturer or supplier.
 6. Sealants, Paint, Primers, Adhesives, and Coating Containers: Return to the supplier or manufacturer for reuse where such program is available.
- B. Comply with the additional requirements specified in Section 01 7419, Construction Waste Management and Disposal.

1.9 FIELD CONDITIONS

- A. No smoking will be permitted in indoor Project site locations, in accordance with California Labor Code (Section 400-6413.5).
- B. Environmental Product Certification:
1. Include certification that indicates cleaning materials comply with requirements of these Specifications.
- C. Construction Ventilation and Preconditioning:
1. Temporary Construction Ventilation: Maintain sufficient temporary ventilation of areas where materials are being used that emit VOCs. Maintain ventilation continuously during installation, and until emissions dissipate following installation. If continuous ventilation is not possible utilizing the building’s HVAC system(s) then ventilation shall be supplied using open windows and temporary fans, sufficient to provide no less than three air changes per hour.
 - a. Period after installation shall be sufficient to dissipate odors and elevated concentrations of VOCs. Where no specific period is stated in these Specifications, a time period of 72 hours shall be used.
 - b. Ventilate areas directly to outside; ventilation to other enclosed areas is not acceptable.
 2. During dust producing activities, including drywall installation and finishing, turn ventilation system off, and openings in supply and return HVAC system shall be protected from dust infiltration. Provide temporary ventilation as required.
 3. Preconditioning: Prior to installation, allow products which have odors and significant VOC emissions to off-gas in dry, well-ventilated space for 14 calendar days to allow for reasonable dissipation of odors and emissions prior to delivery to Project site and installation.

- a. Condition products without containers and packaging to maximize off-gassing of VOCs
- b. Condition products in ventilated warehouse or other building. Comply with substitution requirements for consideration of other locations.

D. Protection:

- 1. Moisture Stains: Materials with evidence of moisture damage, including stains, are not acceptable, including both stored and installed materials; immediately remove from site and properly dispose.
 - a. Take special care to prevent an accumulation of moisture on installed materials and within packaging during delivery, storage, and handling to prevent development of molds and mildew on packaging and on products
 - b. Immediately remove from site and properly dispose of materials showing signs of mold and signs of mildew, including materials with moisture stains.
 - c. Replace moldy materials with new, undamaged materials.
- 2. Ducts: Seal ducts during transportation, delivery, and construction to prevent accumulation of construction dust and construction debris inside of ducts.

PART 2 - PRODUCTS

2.1 SUBSTITUTIONS

- A. Requests for substitutions shall comply with requirements specified in Specification Section 01 3300, Submittals, and with the following additional information required where environmental issues are specified:
 - 1. Indicate how each proposed substitution complies with requirements for VOCs.
 - 2. Owner, in consultation with Architect reserve the right to reject proposed substitutions where data for VOCs is not provided or where emissions of individual VOCs are higher than for the specified materials.
 - 3. Comply with the specified recycled content and other environmental requirements.

PART 3 - EXECUTION

3.1 FIELD QUALITY CONTROL

- A. Sequencing:
 - 1. On-Site Application: Where odorous and/or high VOC emitting products are applied on-site, apply prior to installation of porous and fibrous materials. Where this is not possible, protect porous materials with polyethylene vapor retarders.
 - 2. Complete interior finish material installation no less than 14 days prior to Substantial Completion to allow for Building Flush Out as described in Paragraph 3.1B.

ENVIRONMENTAL PROCEDURES

SECTION 01 3543

3595001

- B. Building Flush Out: Just prior to Substantial Completion, flush out building air continuously using maximum tempered outside air, or maximum amount of outside air while achieving reasonable indoor temperature, for at least 14 calendar days. Continuously is defined as 24 hours per day, 7 days a week. If interruptions of more than a few hours are required for testing and balancing purposes, extend flush out period accordingly in order to achieve the minimum 14 calendar day building flush out period.
 - 1. When Contractor is required to perform touch-up work, provide temporary construction ventilation during installation and extend building flush-out by a minimum of 4 calendar days after touch-up installation is complete with maximum tempered outside air for 24 hours per day.
 - 2. If construction schedule permits, extend flush-out period beyond minimum building flush out period for an additional 15 days.
 - 3. Return ventilation system to normal operation following flush-out period to minimize energy consumption.

3.2 CLEANING

- A. Clean interior and exterior surfaces exposed to view; remove temporary labels, stains, and foreign substances; polish transparent and glossy surfaces using cleaning and maintenance products that conform to standards as described in Part 1 of this Section.
- B. Clean equipment and fixtures to sanitary condition using cleaning and maintenance products that conform to standards as described in Part 1 of this Section.
- C. Products used for cleaning shall comply with Proposition 65 and the additional restrictions for volatile organic compounds specified in Section 01 6116.
- D. Vacuum carpeted and soft surfaces with high efficiency particulate arrestor (HEPA) vacuum.
- E. If ducts were not sealed during construction, and contain dust or dirt, clean ducts using HEPA vacuum immediately prior to Substantial Completion and prior to using ducts to circulate air. Oil film on sheet metal shall be removed before shipment to site. Ducts shall be inspected to confirm that no oil film is present. Remove oil film.
- F. Replace air filters, both pre and final filters, just prior to Substantial Completion.
- G. Remove and properly dispose of recyclable materials using construction waste management program described in Section 01 7419, Construction Waste Management and Disposal.

3.3 PROTECTION

- A. Protect interior materials from water intrusion or penetration where interior products are not intended for wet applications and are exposed to moisture.
- B. Protect installed products using methods that do not support growth of mold and mildew.
 - 1. Immediately remove from site materials with mold or mildew.

END OF SECTION

*p:\sacramento\3595 tracy unified school district\001-000_villalovoz es new shade structures\08 specifications\06 spec\04
final\hirsch\01 3543_environmental procedures.docx*

REGULATORY REQUIREMENTS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Obtaining of Permits, Licenses and Registrations and Work to Comply with All Applicable Laws and Regulations;
- B. Special Conditions; and
- C. Quality Control.

1.02 DESCRIPTION:

This section covers the general requirements for regulatory requirements pertaining to the Work and is supplementary to all other regulatory requirements mentioned or referenced elsewhere in the Contract Documents.

1.03 REQUIREMENTS OF REGULATORY AGENCIES:

- A. All statutes, ordinances, laws, rules, codes, regulations, standards, and the lawful orders of all public authorities having jurisdiction over the Work, are hereby incorporated into these Contract Documents as if repeated in full herein and are intended to be included in any reference to Code or Building Code, unless otherwise specified, including, without limitation, the references in the list below. Contractor shall make available at the Site copies of all the listed documents applicable to the Work as the District and/or Architect may request, including, without limitation, applicable portions of the California Code of Regulations ("CCR").
 - (1) California Building Standards Administrative Code, Part 1, Title 24, CCR.
 - (2) California Building Code (CBC), Part 2, Title 24, CCR; (International Building Code volumes 1-2 and California Amendments).
 - (3) California Electrical Code (CEC), Part 3, Title 24, CCR; (National Electrical Code and California Amendments).
 - (4) California Mechanical Code (CMC), Part 4, Title 24, CCR; (Uniform Mechanical Code and California Amendments).
 - (5) California Plumbing Code (CPC), Part 5, Title 24, CCR; (Uniform Plumbing Code and California Amendments).

- (6) California Fire Code (CFC), Part 9, Title 24, CCR; (International Fire Code and California Amendments).
- (7) California Green Building Standards Code (CALGreen), Part 11, Title 24, CCR.
- (8) California Referenced Standards Code, Part 12, Title 24, CCR.
- (9) State Fire Marshal Regulations, Public Safety, Title 19, CCR.
- (10) Partial List of Applicable National Fire Protection Association (NFPA) Standards:
 - (a) NFPA 13 - Automatic Sprinkler System.
 - (b) NFPA 14 - Standpipes Systems.
 - (c) NFPA 17A - Wet Chemical System
 - (d) NFPA 24 - Private Fire Mains.
 - (e) (California Amended) NFPA 72 - National Fire Alarm Codes.
 - (f) NFPA 253 - Critical Radiant Flux of Floor Covering System.
 - (g) NFPA 2001 - Clean Agent Fire Extinguishing Systems.
- (11) California Division of the State Architect interpretation of Regulations ("DSA IR"), including, without limitation:
 - (a) DSA IR A-6 — Construction Change Document Submittal and Approval Processes.
 - (b) DSA IR A-7 — Project Inspector Certification and Approval.
 - (c) DSA IR A-8 — Project Inspector and Assistant Inspector Duties and Performance.
 - (d) DSA IR A-12 — Assistant Inspector Approval.
- (12) DSA Procedures ("DSA PR")
 - (a) DSA PR 13-01 – Construction Oversight Process
 - (b) DSA PR 13-02 – Project Certification Process

B. This Project shall be governed by applicable regulations, including, without limitation, the State of California's Administrative Regulations for the Division of the State Architect-Structural Safety (DSA/SS), Chapter 4, Part 1, Title 24, CCR, and the most current version on the date the bids are opened and as it pertains to school construction including, without limitation:

- (1) Test and testing laboratory per Section 4-335. District shall pay for the testing laboratory.
- (2) Special inspections per Section 4-333(c).
- (3) Deferred Approvals per section 4-317(g).
- (4) Verified reports per Sections 4-336 & 4-343(c).
- (5) Duties of the Architect & Engineers shall be per Sections 4-333(a) and 4-341.
- (6) Duties of the Contractor shall be per Section 4-343.
- (7) Duties of Project Inspector shall be per Section 4-334.
- (8) Addenda and Construction Change Documents per Section 4-338.

Contractor shall keep and make available all applicable parts of the most current version of Title 24 referred to in the plans and specifications at the Site during construction.

C. Items of deferred approval shall be clearly marked on the first sheet of the Architect's and/or Engineer's approved Drawings. All items later submitted for approval shall be per Title 24 requirements to the DSA.

- (1) Contractor shall submit the following to Architect for review and endorsement:
 - (a) Product information on proposed material/system supplier.
 - (b) Drawings, specifications, and calculations prepared, signed, and stamped by an architect or engineer licensed in the State of California for that portion of the Work.
 - (c) All other requirements as may be required by DSA.
- (2) Cost of preparing and submitting documentation per DSA Deferred Approval requirements including required modifications to Drawings and Specifications, whether or not indicated in the Contract Documents, shall be borne by Contractor.
- (3) Contractor shall not begin fabrication and installation of deferred approval items without first obtaining DSA approval of Drawings and Specifications.
- (4) Schedule of Work Subject to DSA Deferred Approval: Window wall systems exceeding 10 feet in span.

PART 2 – PRODUCTS Not Used.

PART 3 – EXECUTION Not Used.

END OF DOCUMENT

ABBREVIATIONS AND ACRONYMS

PART 1 – GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions including without limitation, Definitions;
- B. Special Conditions.

1.02 DOCUMENT INCLUDES:

- A. Abbreviations used throughout the Contract Documents.
- B. Reference to a technical society, organization, or body is by abbreviation, as follows:

1.	AA	The Aluminum Association
2.	AASHTO	American Association of State Highway and Transportation Officials
3.	ABPA	Acoustical and Board Products Association
4.	ACI	American Concrete Institute
5.	AGA	American Gas Association
6.	AGC	Associated General Contractors of America
7.	AHC	Architectural Hardware Consultant
8.	AHRI	Air Conditioning, Heating, Refrigeration Institute
9.	AI	Asphalt Institute
10.	AIA	American Institute of Architects
11.	AISC	American Institute of Steel Construction
12.	AISI	American Iron and Steel Institute
13.	AMCA	Air Movement and Control Association
14.	ANSI	American National Standards Institute
15.	APA	APA – The Engineered Wood Association
16.	ASCE	American Society of Civil Engineers
17.	ASHRAE	American Society of Heating, Refrigeration and Air Conditioning Engineers
18.	ASME	American Society of Mechanical Engineers
19.	ASTM	American Society of Testing and Materials International
20.	AWPA	American Wood Protection Association
21.	AWPI	American Wood Preservers Institute
22.	AWS	American Welding Society
23.	AWSC	American Welding Society Code
24.	AWI	Architectural Woodwork Institute
25.	AWWA	American Water Works Association
26.	BIA	The Brick Industry Association

27.	CCR	California Code of Regulations
28.	CLFMI	Chain Link Fence Manufacturers Institute
29.	CRA	California Redwood Association
30.	CRSI	Concrete Reinforcing Steel Institute
31.	CS	Commercial Standards
32.	CSI	Construction Specifications Institute
33.	CTI	Cooling Technology Institute
34.	FGIA	Fenestration and Glazing Industry Alliance
35.	FGMA	Flat Glass Manufacturers' Association
36.	FIA	Factory Insurance Association
37.	FM	Factory Mutual Global
38.	FS/FED SPEC	Federal Specification
39.	FTI	Facing Title Institute
40.	GA	Gypsum Association
41.	IAPMO	International Association of Plumbing and Mechanical Officials
42.	ICC	International Code Council
43.	IEEE	Institute of Electrical and Electronics Engineers
44.	IES	Illuminating Engineering Society
45.	MCAC	Mason Contractors Association of California
46.	MIMA	Mineral Wool Insulation Manufacturers Association
47.	MLMA	Metal Lath Manufacturers Association
48.	MS/MIL SPEC	Military Specifications
49.	NAAMM	National Association of Architectural Metal Manufacturers
50.	NBHA	National Builders Hardware Association
51.	NCMA	National Concrete Masonry Association
52.	NCSEA	National Council of Structural Engineers Associations
53.	NEC	National Electrical Code
54.	NEMA	National Electrical Manufacturers Association
55.	NIST	National Institute of Standards and Technology
56.	NSI	Natural Stone Institute
57.	NTMA	National Terrazzo and Mosaic Association, Inc.
58.	ORS	Office of Regulatory Services (California)
59.	OSHA	Occupational Safety and Health Act
60.	PCI	Precast/Prestressed Concrete Institute
61.	PCA	Portland Cement Association
62.	PCA	Painting Contractors Association
63.	PDI	Plumbing Drainage Institute
64.	PEI	Porcelain Enamel Institute, Inc.
65.	PG&E	Pacific Gas & Electric Company
66.	PS	Product Standards
67.	SDI	Steel Door Institute; Steel Deck Institute
68.	SJI	Steel Joist Institute
69.	SSPC	Society for Protective Coatings
70.	TCNA	Tile Council of North America, Inc.
71.	TPI	Truss Plate Institute
72.	UBC	Uniform Building Code
73.	UL	Underwriters Laboratories Code

74.	UMC	Uniform Mechanical Code
75.	USDA	United States Department of Agriculture
76.	VI	Vermiculite Institute
77.	WCLIB	West Coast Lumber Inspection Bureau
78.	WDMA	Window and Door Manufacturers Association
79.	WEUSER	Western Electric Utilities Service Engineering Requirements
80.	WIC	Woodwork Institute of California

PART 2 - PRODUCTS Not Used.

PART 3 - EXECUTION Not Used.

END OF DOCUMENT

DEFINITIONS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions including without limitation, Definitions;
- B. Special Conditions.

1.02 QUALITY ASSURANCE

- A. For products or workmanship specified by association, trade, or Federal Standards, Contractor shall comply with requirements of the standard, except when more rigid requirements are specified in the Contract Documents, or are required by applicable codes.
- B. Contractor shall conform to current reference standard publication date in effect on the date of bid opening.
- C. Contractor shall obtain copies of standards unless specifically required not to by the Contract Documents.
- D. Contractor shall maintain a copy of all standards at jobsite during submittals, planning, and progress of the specific Work, until final completion, unless specifically required not to by the Contract Documents.
- E. Should specified reference standards conflict with Contract Documents, Contractor shall request clarification from the District and/or the Architect before proceeding.
- F. The contractual relationship of the parties to the Contract shall not be altered from the contractual relationship as indicated in the Contract Documents by mention or inference otherwise in any referenced document.
- G. Governing Codes shall be as shown in the Contract Documents including, without limitation, the Specifications.

END OF DOCUMENT

REFERENCES**PART 1 - GENERAL****1.01 SCHEDULE OF REFERENCES:**

The following information is intended only for the general assistance of the Contractor, and the District does not represent that all of the information is current. It is the Contractor's responsibility to verify the correct information for each of the entities listed.

AA	The Aluminum Association 1400 Crystal Drive, Suite 430 Arlington, VA 22202 www.aluminum.org	703/358-2960
AABC	Associated Air Balance Council 2401 Pennsylvania Avenue NW, Suite 330 Washington, DC 20037 www.aabc.com	202/737-0202
AASHTO	American Association of State Highway and Transportation Officials 555 12th St. NW - Suite 1000 Washington, DC 20004 www.transportation.org	202/624-5800
AATCC	American Association of Textile Chemists and Colorists P.O. Box 12215 Research Triangle Park, NC 27709-2215 www.aatcc.org	919/549-8141
ACA	American Coatings Association 901 New York Ave., NW, Suite 300 West Washington, DC 20001 www.paint.org	202/462-6272
ACI	American Concrete Institute 38800 Country Club Dr. Farmington Hills, MI 48331-3439 www.concrete.org	248/848-3800
ACPA	American Concrete Pipe Association 5605 N. MacArthur Blvd., Suite 340 Irving, TX 75038 www.concrete-pipe.org	972/506-7216

ADC	Air Duct Council 1901 N. Roselle Road, Suite 800 Schaumburg, IL 60195 www.flexibleduct.org	847/706-6750
AF&PA	American Forest and Paper Association 1101 K Street, NW, Suite 700 Washington, DC 20005 www.afandpa.org	202/463-2700
AGA	American Gas Association 400 North Capitol Street, NW, Suite 450 Washington, DC 20001 www.aga.org	202/824-7000
AGC	Associate General Contractors of America 2300 Wilson Blvd., Suite 300 Arlington, VA 22201 www.agc.org	703/548-3118
AHA	American Hardboard Association 1210 West Northwest Highway Palatine, IL 60067 http://domensino.com/AHA/default.htm	847/934-8800
AI	Asphalt Institute 2696 Research Park Drive Lexington, KY 40511-8480 www.asphaltinstitute.org	859/288-4960
AIA	The American Institute of Architects 1735 New York Ave., NW Washington, DC 20006-5292 www.aia.org	202/626-7300
AISC	American Institute of Steel Construction 130 East Randolph Street, Suite 2000 Chicago, IL 60601 www.aisc.org	312.670.2400
AISI	American Iron and Steel Institute 25 Massachusetts Ave., NW, Suite 800 Washington, DC 20001 www.steel.org	202/452-7100
AITC	American Institute of Timber Construction 1010 South 336th Street, #210 Federal Way, WA 98003-7394 https://www.plib.org/aitc/	253/835-3344

ALI	Associated Laboratories, Inc. P.O. Box 152837 Dallas, TX 75315 www.assoc-labs.com	214/565-0593
ALSC	American Lumber Standards Committee, Inc. 7470 New Technology Way, Suite F Frederick, MD 21703 www.alsc.org	301/972-1700
AMCA	Air Movement and Control Association International, Inc. 30 W. University Drive Arlington Heights, IL 60004 www.amca.org	847/394-0150
AMPP (formerly SSPC)	Association for Materials Protection and Performance (merger of Society for Protective Coatings and National Association of Corrosion Engineers International) (formerly Steel Structures Painting Council) 800 Trumbull Drive Pittsburgh, PA 15205 www.sspc.org	412/281-2331 877/281-7772
ANLA	AmericanHort (merger of American Nursery & Landscape Association and OFA – The Association of Horticultural Professionals) 2130 Stella Court Columbus, OH 43215 www.americanhort.org	614/487-1117
ANSI	American National Standards Institute 1899 L Street, NW, 11th Floor Washington, DC 20036 www.ansi.org	202/293-8020
APA	APA-The Engineered Wood Association 7011 S. 19th Street Tacoma, WA 98466-5333 www.apawood.org	253/565-6600

APA	Architectural Precast Association 325 John Knox Rd, Suite L-103 Tallahassee, FL 32303 www.archprecast.org	850/205-5637
APCIA	American Property Casualty Insurance Association (merger of American Insurance Association (formerly the National Board of Fire Underwriters) with the Property Casualty Insurers Association of America) 555 12th St, NW, Suite 550 Washington DC 20004 www.apci.org	202/828-7100
AHRI	Air Conditioning and Refrigeration Institute (now Air-Conditioning, Heating, & Refrigeration Institute) 2311 Wilson Blvd, Suite 400 Arlington, VA 22201 www.ahrinet.org	703/524-8800
ARMA	Asphalt Roofing Manufacturers Association 2331 Rock Spring Road Forest Hill, MD 21050 www.asphaltroofing.org	443/640-1075
ASA	The Acoustical Society of America Suite 300 1305 Walt Whitman Road Melville, NY 11747-4300 https://acousticalsociety.org/	516/576-2360
ASCE	American Society of Civil Engineers 1801 Alexander Bell Drive Reston, VA 20191 www.asce.org	800/548-2723 703/295-6300
ASHRAE	American Society of Heating, Refrigerating and Air Conditioning Engineers 180 Technology Parkway Peachtree Corners, GA 30092 www.ashrae.org	800/527-4723 404/636-8400
ASLA	American Society of Landscape Architects 636 Eye Street, NW Washington, DC 20001-3736 www.asla.org	202/898-2444
ASME	American Society of Mechanical Engineers Two Park Avenue New York, NY 10016-5990 www.asme.org	800/834-2763

ASPE	American Society of Plumbing Engineers 6400 Shafer Court, Suite 350 Rosemont, IL 60018 http://aspe.org	847/296-0002
ASQ	American Society for Quality P.O. Box 3005 Milwaukee, WI 53201-3005 or 600 North Plankinton Avenue Milwaukee, WI 53203 http://asq.org	800/248-1946 414/272-8575
ASSE	American Society of Sanitary Engineering 18927 Hickory Creek Dr., Suite 220 Mokena, IL 60448 www.asse-plumbing.org	708/995-3019
ASTM	ASTM International 100 Barr Harbor Drive PO Box C700 West Conshohocken, PA, 19428-2959 www.astm.org	610/832-9500
AWCI	Association of the Wall and Ceiling Industry 513 West Broad Street, Suite 210 Falls Church, VA 22046 www.awci.org	703/538-1600
AWPA	American Wood Protection Association (formerly American Wood Preservers Institute) P.O. Box 361784 Birmingham, AL 35236-1784 www.awpa.com	205/733-4077
AWS	American Welding Society 8669 NW 36 Street, Suite 130 Miami, FL 33166 www.aws.org	800/443-9353 305/443-9353
AWI	Architectural Woodwork Institute 46179 Westlake Drive, Suite 120 Potomac Falls, VA 20165-5874 www.awinet.org	571/323-3636
AWWA	American Water Works Association 6666 West Quincy Avenue Denver, CO 80235 www.awwa.org	800/926-7337 303/794-7711

BHMA	Builders Hardware Manufacturers Association 355 Lexington Avenue, 15th Floor New York, NY 10017 www.buildershardware.com	212/297-2122
BIA	The Brick Industry Association 12007 Sunrise Valley Drive, Suite 430 Reston, VA 20191 www.gobrick.com	703/620-0010
CGA	Compressed Gas Association 8484 Westpark Drive, Suite 220 McLean, VA 22102 www.cganet.com	703/788-2700
CISCA	Ceilings & Interior Systems Construction Association 1010 Jorie Blvd, Suite 30 Oak Brook, IL 60523 www.cisca.org	630/584-1919
CISPI	Cast Iron Soil Pipe Institute 2401 Fieldcrest Dr. Mundelein, IL 60060 www.cispi.org	224/864-2910
CLFMI	Chain Link Fence Manufacturers Institute 10015 Old Columbia Road, Suite B-215 Columbia, MD 21046 chainlinkinfo.org	301/596-2583
CPA	Composite Panel Association 19465 Deerfield Avenue, Suite 306 Leesburg, VA 20176 www.compositepanel.org	703/724-1128
CPSC	Consumer Product Safety Commission 4330 East-West Highway Bethesda, MD 20814 www.cpsc.gov	800/638-2772
CRA	California Redwood Association 818 Grayson Road, Suite 201 Pleasant Hill, CA 94523 www.calredwood.org	925/935-1499

CRI	Carpet and Rug Institute 100 S. Hamilton Street Dalton, GA 30722-2048 www.carpet-rug.org	706/278-3176
CRSI	Concrete Reinforcing Steel Institute 933 N. Plum Grove Road Schaumburg, IL 60173-4758 www.crsi.org	847/517-1200
CSI	The Construction Specifications Institute 123 North Pitt St, Suite 450 Alexandria, VA 22314 www.csinet.org	800/689-2900
CTIOA	Ceramic Tile Institute of America 12061 Jefferson Blvd. Culver City, CA 90230-6219 www.ctioa.org	310/574-7800
DHA	Decorative Hardwoods Association (formerly Hardwood Plywood & Veneer Association) 42777 Trade West Dr. Sterling, VA 20166 https://www.decorativehardwoods.org/	703/435-2900
DHI	Door and Hardware Institute (formerly National Builders Hardware Association) 2001 K Street NW, 3rd Floor North Washington, DC 20006 www.dhi.org	202/367-1134
DIPRA	Ductile Iron Pipe Research Association P.O. Box 190306 Birmingham, AL 35219 www.dipra.org	205/402-8700
DOC	U.S. Department of Commerce 1401 Constitution Ave., NW Washington, DC 20230 www.commerce.gov	202/482-2000
DOT	U.S. Department of Transportation 1200 New Jersey Avenue, SE Washington, DC 20590 www.dot.gov	855/368-4200
EJMA	Expansion Joint Manufacturers Association, Inc. 25 North Broadway Tarrytown, NY 10591 www.ejma.org	914/332-0040

EPA	Environmental Protection Agency Ariel Rios Building 1200 Pennsylvania Avenue, N.W. Washington, DC 20460 www.epa.gov	202/272-0167
FCICA	Floor Covering Installation Contractors Association 800 Roosevelt Rd., Bldg. C, Suite 312 Glen Ellyn, IL 60137 www.fcica.com	630/672-3702
FGIA	Fenestration and Glazing Industry Alliance 1900 E Golf Rd, Suite 1250 Schaumburg, IL 60173 https://fgiaonline.org/	847/303-5664
FM Global	Factory Mutual Insurance Company Amy Daley Global Practice Leader – Education, Public Entities, Health Care FM Global 270 Central Avenue Johnston, RI 02919-4949 www.fmglobal.com	401/275-3000 401/275-3029
FS	General Services Administration (GSA) Index of Federal Specifications, Standards and Commercial Item Descriptions 470 East L'Enfant Plaza, SW, Suite 8100 Washington, DC 20407 www.gsa.gov	202/619-8925
GA	The Gypsum Association 962 Wayne Ave., Suite 620 Silver Spring, MD 20910 www.gypsum.org	301/277-8686
HMA	Hardwood Manufacturers Association One Williamsburg Place, Suite 108 Warrendale, PA 15086 http://hmamembers.org	412/244-0440

IAPMO	International Association of Plumbing and Mechanical Officials (formerly the Western Plumbing Officials Association) 4755 E. Philadelphia St. Ontario, CA 91761 www.iapmo.org	909/472-4100
ICC	International Code Council 500 New Jersey Avenue, NW, 6th Floor Washington, DC 20001 www.iccsafe.org	888/422-7233
IEEE	Institute of Electrical and Electronics Engineers 3 Park Avenue, 17th Floor New York, NY 10016-5997 www.ieee.org	212/419-7900
IES	Illuminating Engineering Society 120 Wall Street, Floor 17 New York, NY 10005-4001 www.ies.org	212/248-5000
ITRK	Intertek Testing Services 3933 US Route 11 Cortland, NY 13045 www.intertek.com	607/753-6711
MCAA	Mechanical Contractors Association of America 1385 Piccard Drive Rockville, MD 20850 www.mcaa.org	301/869-5800
MMPA (formerly WMMPA)	Moulding & Millwork Producers Association (formerly Wood Moulding & Millwork Producers Association) 507 First Street Woodland, CA 95695 www.wmmpa.com	530/661-9591 800/550-7889
MSS	Manufacturers Standardization Society (MSS) of the Valve and Fittings Industry, Inc. 127 Park Street, NE Vienna, VA 22180-4602 http://mss-hq.org	703/281-6613
NAAMM	National Association of Architectural Metal Manufacturers 800 Roosevelt Rd. Bldg. C, Suite 312 Glen Ellyn, IL 60137 www.naamm.org	630/942-6591

NAIMA	North American Insulation Manufacturers Association P.O. Box 1906 Alexandria, VA 22313 https://insulationinstitute.org/	703/684-0084
NALP	National Association of Landscape Professionals (formerly Professional Landcare Network) 12500 Fair Lakes Circle, Suite 200 Fairfax, VA 22033 https://www.landscapeprofessionals.org/	703/736-9666
NAPA	National Asphalt Pavement Association 6406 Ivy Lane, Suite 350 Greenbelt, MD 20770-1441 www.asphaltpavement.org	888/468-6499 301/731-4748
NCSPA	National Corrugated Steel Pipe Association 14070 Proton Road, Suite 100 Dallas, TX 75244 www.ncspa.org	972/850-1907
NCMA	National Concrete Masonry Association 13750 Sunrise Valley Drive Herndon, VA 20171-4662 www.ncma.org	703/713-1900
NEBB	National Environmental Balancing Bureau 8575 Grovemont Circle Gaithersburg, MD 20877 www.nebb.org	301/977-3698
NECA	National Electrical Contractors Association 1201 Pennsylvania Ave. NW Washington, D.C., 20004 www.necanet.org	202/991-6300
NEMA	National Electrical Manufacturers Association 1300 North 17th Street N, Suite 900 Rosslyn, VA 22209 www.nema.org	703/841-3200
NEII	National Elevator Industry, Inc. 5537 SW Urish Road Topeka, KS 66610 https://nationalelevatorindustry.org/	703/589-9985
NFPA	National Fire Protection Association 1 Batterymarch Park Quincy, MA 02169-7471 www.nfpa.org	800/344-3555 855/274-8525

NGA (formerly GANA)	National Glass Association (merged with Glass Association of North America) 1945 Old Gallows Road Suite 750 Vienna, VA 22182 www.glass.org	866/342-5642 Ext 127
NHLA	National Hardwood Lumber Association PO Box 34518 Memphis, TN 38184 www.nhla.com	901/377-1818
NIA	National Insulation Association 516 Herndon Pkwy., Ste. D Herndon, VA 20170 www.insulation.org	703/464-6422
NRCA	National Roofing Contractors Association 10255 W. Higgins Road, Suite 600 Rosemont, IL 60018-5607 www.nrca.net	847/299-9070
NSF	NSF International 789 N. Dixboro Road Ann Arbor, MI 48113-0140 www.nsf.org	800/673-6275 734/769-8010
NSI	Natural Stone Institute (formerly Marble Institute of America) 380 E. Lorain St. Oberlin, OH 44074 https://www.naturalstoneinstitute.org/	440/250-9222
NTMA	National Terrazzo and Mosaic Association 209 N. Crockett Street, Suite 2 PO Box 2605 Fredericksburg, TX 78624 www.ntma.com	800/323-9736
OSHA	Occupational Safety and Health Act U.S. Department of Labor Occupational Safety & Health Administration 200 Constitution Ave., NW Washington, DC 20210 www.osha.gov	800/321-OSHA (6742)

PCA	Portland Cement Association 5420 Old Orchard Road Skokie, IL 60077 or 200 Massachusetts Ave NW, Suite 200 Washington, DC 20001 www.cement.org	847/966-6200 202/408-9494
PCA	Painting Contractors Association (formerly Painting and Decorating Contractors of America) 2316 Millpark Drive Maryland Heights, MO 63043 https://www.pcapainted.org/	800/322-7322
PCI	Precast/Prestressed Concrete Institute 8770 W. Bryn Mawr Ave., Suite 1150 Chicago, IL 60631 www.pci.org	312/786-0300
PDI	Plumbing & Drainage Institute 800 Turnpike Street, Suite 300 North Andover, MA 01845 http://pdionline.org	978/557-0720 800/589-8956
PEI	Porcelain Enamel Institute, Inc. P.O. Box 920220 Norcross, GA 30010 www.porcelainenamel.com	770/676-9366
PG&E	Pacific Gas & Electric Company P.O. Box 997300 Sacramento, CA 95899-7300 www.pge.com	800/743-5000
PLIB	Pacific Lumber Inspection Bureau (formerly West Coast Lumber Inspection Bureau) 1010 South 336th Street, Suite 210 Federal Way, WA 98003-7394 https://www.plib.org/	253/835-3344
RFCI	Resilient Floor Covering Institute 115 Broad Street, Suite 201 La Grange, GA 30240 www.rfci.com	706/882-3833
SDI	Steel Deck Institute P.O. Box 426 Glenshaw, PA 15116 www.sdi.org	412/487-3325

SDI	Steel Door Institute 30200 Detroit Road Westlake, OH 44145 www.steeldoor.org	440/899-0010
SJI	Steel Joist Institute 140 West Evans Street, Suite 203 Florence, SC 29501 http://steeljoist.org	843/407-4091
SMA	Stucco Manufacturers Association 5753 E Santa Ana Cyn Rd, #G-156 Anaheim, CA 92807 www.stuccomfgassoc.com	714/473-9579
SMACNA	Sheet Metal and Air Conditioning Contractors' National Association 4201 Lafayette Center Drive Chantilly, VA 20151-1219 www.smacna.org	703/803-2980
SPI	SPI: The Plastics Industry Trade Association, Inc. 1425 K St. NW, Suite 500 Washington, DC 20005 www.plasticsindustry.org	202/974-5200
TCA	The Tile Council of North America 100 Clemson Research Blvd. Anderson, SC 29625 www.tcnatile.com	864/646-8453
TPI	Truss Plate Institute 2670 Crain Highway, Suite 203 Waldorf, MD 20601 www.tpinst.org	240/587-5582
TPI	Turfgrass Producers International 444 E. Roosevelt Road #346 Lombard, IL 60148 www.turfgrasssod.org	800/405-8873 847/649-5555
TCIA	Tree Care Industry Association (formerly the National Arborist Association) 670 N Commercial Street, Suite 201 Manchester, NH 03101 www.tcia.org	603/314-5380 800/733-2622

TVI	The Vermiculite Institute c/o The Schundler Company 10 Central Street Nahant, MA 01908 www.vermiculiteinstitute.org	732/287-2244
UL	Underwriters Laboratories Inc. 333 Pfingsten Road Northbrook, IL 60062-2096 www.ul.com	847/272-8800 877/854-3577
UNI	Uni-Bell PVC Pipe Association 201 E. John Carpenter Freeway, Suite 750 Irving, TX 75062 www.uni-bell.org	972/243-3902
USDA	U.S. Department of Agriculture 1400 Independence Ave., S.W. Washington, DC 20250 www.usda.gov	202/720-2791
WA	Wallcoverings Association 35 E Wacker Dr., Suite 850 Chicago, IL 60601 www.wallcoverings.org	312/224-2574
WCMA	Window Covering Manufacturers Association 355 Lexington Avenue 15th Floor New York, NY 10017 www.wcmanet.org	212/297-2122
WDMA	Window & Door Manufacturers Association 2001 K Street NW, 3rd Floor North Washington, D.C. 20006 www.wdma.com	202/367-1157
WI	Woodwork Institute 1455 Response Road, Suite 110 Sacramento, CA 95815 www.wicnet.org	916/372-9943
WRI	Wire Reinforcement Institute 942 Main Street, Suite 300 Hartford, CT 06103 www.wirereinforcementinstitute.org	860/240-9545
WWCA	Western Wall & Ceiling Contractors Association 1910 N. Lime St. Orange, CA 92865 www.wwcca.org	714/221-5520

WWPA	Western Wood Products Association (formerly Redwood Inspection Service) 1500 SW First Ave., Suite 870 Portland, OR 97201 www.wwpa.org	503/224-3930
------	--	--------------

PART 2 - PRODUCTS Not Used.

PART 3 - EXECUTION Not Used.

END OF DOCUMENT

MATERIALS AND EQUIPMENT

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Purchase of Materials and Equipment;
- B. Special Conditions;
- C. Imported Materials Certification.

1.02 MATERIAL AND EQUIPMENT

- A. Only items approved by the District and/or Design Professional shall be used.
- B. Contractor shall submit lists of products and other product information in accordance with the Contract Documents, including, without limitation, the provisions regarding the submittals.

1.03 MATERIAL AND EQUIPMENT COLORS

- A. The District and/or Architect will provide a schedule of colors.
- B. No individual color selections will be made until after approval of all pertinent materials and equipment and after receipt of appropriate samples in accordance with the Contract Documents, including, without limitation, the provisions regarding the submittals.
- C. Contractor shall request priority in writing for any item requiring advance ordering to maintain the approved Construction Schedule.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. Contractor shall deliver manufactured materials in original packages, containers, or bundles (with seals unbroken), bearing name or identification mark of manufacturer.
- B. Contractor shall deliver fabrications in as large assemblies as practicable; where specified as shop-primed or shop-finished, package or crate as required to preserve such priming or finish intact and free from abrasion.
- C. Contractor shall store materials in such a manner as necessary to properly protect them from damage. Materials or equipment damaged by handling, weather, dirt, or from any other cause will not be accepted.

- D. Materials are not acceptable that have been warehoused for long periods of time, stored or transported in improper environment, improperly packaged, inadequately labeled, poorly protected, excessively shipped, deviated from normal distribution pattern, or reassembled.
- E. Contractor shall store material so as to cause no obstructions of sidewalks, roadways, access to the Site or buildings, and underground services. Contractor shall protect material and equipment furnished under Contract.
- F. Contractor may store materials on Site with prior written approval by the District, all material shall remain under Contractor's control and Contractor shall remain liable for any damage to the materials. Should the Project Site not have storage area available, the Contractor shall provide for off-site storage at a bonded warehouse and with appropriate insurance coverage at no cost to District.
- G. When any room in Project is used as a shop or storeroom, the Contractor shall be responsible for any repairs, patching, or cleaning necessary due to that use. Location of storage space shall be subject to prior written approval by District.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Manufacturers listed in various sections of Contract Documents are names of those manufacturers that are believed to be capable of supplying one or more of items specified therein.
- B. The listing of a manufacturer does not imply that every product of that manufacturer is acceptable as meeting the requirements of the Contract Documents.

2.02 FACILITIES AND EQUIPMENT

Contractor shall provide, install, maintain, and operate a complete and adequate facility for handling, the execution, disposal, and distribution of material and equipment as required for proper and timely performance of Work connected with Contract.

2.03 MATERIAL REFERENCE STANDARDS

Where material is specified solely by reference to "standard specifications" and if requested by District, Contractor shall submit for review data on actual material proposed to be incorporated into Work of Contract listing name and address of vendor, manufacturer, or producer, and trade or brand names of those materials, and data substantiating compliance with standard specifications.

PART 3 - EXECUTION

3.01 WORKMANSHIP

- A. Where not more specifically described in any other Contract Documents, workmanship shall conform to methods and operations of best standards and accepted practices of trade or trades involved and shall include items of fabrication, construction, or installation regularly furnished or required for completion (including finish and for successful operation, as intended).
- B. Work shall be executed by tradespersons skilled in their respective lines of Work. When completed, parts shall have been durably and substantially built and present a neat appearance.

3.02 COORDINATION

- A. Contractor shall coordinate installation of Work so as to not interfere with installation of others. Adjustment or rework because of Contractor's failure to coordinate will be at no additional cost to District.
- B. Contractor shall examine in-place work for readiness, completeness, fitness to be concealed or to receive other work, and in compliance with Contract Documents. Concealing or covering Work constitutes acceptance of additional cost which will result should in-place Work be found unsuitable for receiving other Work or otherwise deviating from the requirements of the Contract Documents.

3.03 COMPLETENESS

Contractor shall provide all portions of the Work, unless clearly stated otherwise, installed complete and operational with all elements, accessories, anchorages, utility connections, etc., in manner to assure well-balanced performance, in accordance with manufacturer's recommendations and by Contract Documents. Terms such as "installed complete," "operable condition," "for use intended," "connected to all utilities," "terminate with proper cap," "adequately anchored," "patch and refinish," "to match similar," should be assumed to apply in all cases, except where completeness of functional or operable condition is specifically stated as not required.

3.04 APPROVED INSTALLER OR APPLICATOR

Installation by a manufacturer's approved installer or applicator is an understood part of Specifications and only approved installer or applicator is to provide on-site Work where specified manufacturer has on-going program of approving (i.e. certifying, bonding, re-warranting) installers or applicators. Newly established relationships between a manufacturer and an installer or applicator who does not have other approved applicator work in progress or completed is not approved for this Project.

3.05 MANUFACTURER'S RECOMMENDATIONS

All installations shall be in accordance with manufacturer's published recommendations and specific written directions of manufacturer's representative.

Should Contract Documents differ from recommendations of manufacturer or directions of his representative, Contractor shall analyze differences, make recommendations to the District and the Architect in writing, and shall not proceed until interpretation or clarification has been issued by the District and/or the Architect.

END OF DOCUMENT

QUALITY CONTROL

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Inspector, Inspections and Tests, Uncovering of Work and Non-conforming of Work and Correction of Work;
- B. Special Conditions.

1.02 RELATED CODES:

- A. The Work is governed by requirements of Title 24, California Code of Regulations ("CCR"), and the Contractor shall keep a copy of these available at the job Site for ready reference during construction.
- B. The Division of the State Architect ("DSA") shall be notified at or before the start of construction.

1.03 OBSERVATION AND SUPERVISION:

- A. The District and Architect or their appointed representatives will review the Work and the Contractor shall provide facilities and access to the Work at all times as required to facilitate this review. Administration by the Architect and any consulting Structural Engineer will be in accordance with applicable regulations, including, without limitation, CCR, Part 1, Title 24, Section 4-341.
- B. One or more Project Inspector(s) approved by DSA and employed by or in contract with the District, referred to hereinafter as the "Project Inspector", will observe the work in accordance with CCR, Part 1, Title 24, Sections 4-333(b) and 4-342:
 - (1) The Project Inspector and Special Inspector(s) shall have access to the Work wherever it is in preparation or progress for ascertaining that the Work is in accordance with the Contract Documents and all applicable code sections. The Contractor shall provide facilities and operation of equipment as needed, and access as required and shall provide assistance for sampling or measuring materials.
 - (2) The Project Inspector will notify the District and Architect and call the attention of the Contractor to any observed failure of Work or material to conform to Contract Documents.

The Contractor shall conform with all applicable laws as indicated in the Contract Documents, including, without limitation, to CCR, Part 1, Title 24, Section 4-343.

The Contractor shall supervise and direct the Work and maintain a competent superintendent on the job who is authorized to act in all matters pertaining to the Work. The Contractor's superintendent shall also inspect all materials, as they arrive, for compliance with the Contract Documents. Contractor shall reject defective Work or materials immediately upon delivery or failure of the Work or material to comply with the Contract Documents. The Contractor shall submit verified reports as indicated in the Contract Documents, including, without limitation, the Specifications and as required by Part 1, Title 24, Section 4-336.

1.04 TESTING AGENCIES:

- A. Testing agencies and tests shall be in conformance with the General Documents and the requirements of Part 1, Title 24, Section 4- 335.
- B. Testing and inspection in connection with earthwork shall be under the direction of the District's consulting soils engineer, if any, referred to hereinafter as the "Soils Engineer."
- C. Testing and inspection of construction materials and workmanship shall be performed by a qualified laboratory, referred to hereinafter as the "Testing Laboratory." The Testing Laboratory shall be under direction of an engineer registered in the State of California, shall conform to requirements of ASTM E329, and shall be employed by or in contract with the District.
- D. Testing laboratory shall be approved by the Architect and the Division of the State Architect.
- E. Owner will employ and pay for services of an independent testing labatory to perform specified inspection and testing. Retesting cost for failed test will be Contractors responsibilityand will be back-charged against the contract.

1.05 TESTS AND INSPECTIONS:

- A. The Contractor shall be responsible for notifying the District and Project Inspector of all required tests and inspections. Contractor shall notify the District and Project Inspector at least seventy-two hours (72) hours in advance of performing any Work requiring testing or inspection.
- B. The Contractor shall provide access to Work to be tested and furnish incidental labor, equipment, and facilities to facilitate all inspections and tests.
- C. The District will pay for first inspections and tests required by the "CCR", and other inspections or tests that the District and/or the Architect may direct to have made, including the following principal items:
 - (1) Tests and observations for earthwork and paving.
 - (2) Tests for concrete mix designs, including tests of trial batches.
 - (3) Tests and inspections for structural steel work.
 - (4) Field tests for framing lumber moisture content.

- (5) Additional tests directed by the District that establish that materials and installation comply with the Contract Documents.
 - (6) Tests and observations of welding and expansion anchors.
- D. The District may at its discretion, pay and then back charge the Contractor for:
 - (1) Retests or reinspections, if required, and tests or inspections required due to Contractor error or lack of required identifications of material.
 - (2) Uncovering of work in accordance with Contract Documents.
 - (3) Testing done on weekends, holidays, and overtime will be chargeable to the Contractor for the overtime portion.
 - (4) Testing done off Site.
- E. Testing and inspection reports and certifications:
 - (1) If initially received by Contractor, Contractor shall provide to each of the following a copy of the agency or laboratory report of each test or inspection or certification.
 - (a) The District;
 - (b) The Construction Manager, if any;
 - (c) The Architect;
 - (d) The Consulting Engineer, if any;
 - (e) Other engineers on the Project, as appropriate;
 - (f) The Project Inspector; and
 - (g) The Contractor.
 - (2) When the test or inspection is one required by the CCR, a copy of the report shall also be provided to the DSA.

1.06 LABORATORY REPORTS

- A. After each inspection and test, promptly submit two copies of laboratory report to Owner, Architect, Contractor and DSA.
- B. Include:
 - (1) Date of issue,
 - (2) DSA Application and File numbers,
 - (3) Project title and number,

- (4) Name of inspector,
 - (5) Date and time of sampling or inspection,
 - (6) Identification of product and Specification Section,
 - (7) Location in the Project,
 - (8) Type of inspection or test,
 - (9) Date of test,
 - (10) Results of test,
 - (11) Conformance with Contract Documents.
- C. When requested by Architect, provide interpretation of test results.

1.07 LIMITS ON TESTING LABORATORY AUTHORITY

- A. Laboratory may not release, revoke, alter or enlarge on requirements of Contract Documents.
- B. Laboratory may not approve or accept any portion of the work.
- C. Laboratory may not assume any duties of Contractor.
- D. Laboratory has no authority to stop the work.

PART 2 - PRODUCTS

2.01 TYPE OF TEST AND INSPECTIONS

- A. Testing and inspection shall be in accordance with DSA Form 103 (or current version)
- B. Slump Test
ASTM C 143
- C. Concrete Tests

Testing agency shall test concrete used in the work per the following paragraphs:

- (1) Compressive Strength:
 - (a) Minimum number of tests required: One (1) set of three (3) cylinders for each 100 cubic yards (Sec. 2604(h) 01) of concrete or major fraction thereof, placed in one (1) day. See Title 24, Section 2605(g).

- (b) Two cylinders of each set shall be tested at twenty-eight (28) days. One (1) cylinder shall be held in reserve and tested only when directed by the Architect or District.
- (c) Concrete shall test the minimum ultimate compressive strength in twenty-eight 28 days, as specified on the structural drawings.
- (d) In the event that the twenty-eight (28) day test falls below the minimum specified strength, the effective concrete in place shall be tested by taking cores in accordance with UBC Standard No. 26-13 and tested as required for cylinders.
- (e) In the event that the test on core specimens falls below the minimum specified strength, the concrete will be deemed defective and shall be removed and replaced upon such direction of the Architect, and in a manner acceptable to the Division of the State Architect.

D. Reinforcing, Steel

PART 3 - EXECUTION Not Used.

END OF DOCUMENT

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Requirements for Testing Laboratory.
 - 2. Contractor's responsibilities for facilitation of Testing and Inspections.

1.2 RELATED SECTIONS AND DOCUMENTS

- A. Geologic Hazards & Soils Report.
- B. DSA 103 - Structural Test & Inspections List.
- C. Section 31 0000, Earthwork.
- D. Individual Specification Sections: Inspections and tests required, and standards for testing.

1.3 REFERENCES

- A. California Administrative Code (CAC), edition as noted on the drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Building Code (CBC), edition as noted on the drawings, as adopted by the California Division of the State Architect (DSA).

1.4 SELECTION AND PAYMENT

- A. Testing laboratory shall be approved by both the Architect and the Division of the State Architect.
- B. Owner will employ and pay for services of an independent testing laboratory to perform specified inspection and testing. Retesting costs for failed tests will be the Contractors responsibility and will be back-charged against the contract.
- C. Under provisions for Relocatable Building construction, Owner limits his exposure to in-plant inspection and testing costs. Refer to other Specification Sections related to such specific construction.
- D. Employment of testing laboratory shall in no way relieve Contractor of obligation to perform work in accordance with requirements of Contract Documents.

1.5 LABORATORY REPORTS

- A. After each inspection and test, promptly submit two copies of laboratory report to Owner, Architect, Contractor and DSA.
- B. Include:

TESTING AND INSPECTION SERVICES

SECTION 01 4523

3595001

1. Date of issue,
2. DSA Application and File numbers,
3. Project title and number,
4. Name of inspector,
5. Date and time of sampling or inspection,
6. Identification of product and Specification Section,
7. Location in the Project,
8. Type of inspection or test,
9. Date of test,
10. Results of test,
11. Conformance with Contract Documents.

C. When requested by Architect, provide interpretation of test results.

1.6 LIMITS ON TESTING LABORATORY AUTHORITY

- A. Laboratory may not release, revoke, alter or enlarge on requirements of Contract Documents.
- B. Laboratory may not approve or accept any portion of the work.
- C. Laboratory may not assume any duties of Contractor.
- D. Laboratory has no authority to stop the work.

1.7 CONTRACTOR RESPONSIBILITIES

- A. Deliver to laboratory at designated location, adequate samples of materials proposed to be used which require testing, along with proposed mix designs. Allow reasonable time for review and testing.
- B. Arrange for, and coordinate with, laboratory for all required testing and inspection. Provide adequate notice, in advance, for proper scheduling and processing of testing. The Inspector will not be responsible for scheduling or arranging for testing and inspection services.
- C. Cooperate with laboratory personnel, and provide access to the work and to manufacturer's facilities.
- D. Provide incidental labor and facilities to provide access to work to be tested, to obtain and handle samples at the site or at the source of products to be tested, to facilitate tests and inspections, storage and curing of test samples.
- E. Notify Architect, Inspector, Structural Engineer (when applicable) and laboratory 24 hours prior to expected time for operations requiring inspection and testing services.

END OF SECTION

TESTING AND INSPECTION SERVICES
SECTION 01 4523
3595001

*p:\sacramento\3595 tracy unified school district\001-000_villalovoz es new shade structures\08 specifications\06 spec\04
final\hirsch\01 4523_testing and inspection services.docx
Last Updated: December 16, 2021*

TEMPORARY FACILITIES AND CONTROLS

PART 1 – GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions;
- B. Special Conditions;
- C. Site Standards; and
- D. Construction Waste Management and Disposal.

1.02 TEMPORARY UTILITIES:

A. Electric Power and Lighting:

- (1) Contractor will pay for power during the course of the Work. To the extent power is available in the building(s) or on the Site, Contractor may use the District's existing utilities by making prearranged payments to the District for the utilities used by Contractor and all Subcontractors. Contractor shall be responsible for providing temporary facilities required to deliver that power service from its existing location in the building(s) or on the Site to point of intended use.
- (2) Contractor shall verify characteristics of power available in building(s) or on the Site. Contractor shall take all actions required to make modifications where power of higher voltage or different phases of current are required. Contractor shall be fully responsible for providing that service and shall pay all costs required therefor.
- (3) Contractor shall furnish, wire for, install, and maintain temporary electrical lights wherever it is necessary to provide illumination for the proper performance and/or observation of the Work: a minimum of 20 foot-candles for rough work and 50 foot-candles for finish work.
- (4) Contractor shall be responsible for maintaining existing lighting levels in the project vicinity should temporary outages or service interruptions occur.

B. Water:

- (1) Contractor shall pay for water used during the course of the Work. Contractor shall coordinate and pay for installation or use of water meter in compliance with local water agency requirements. To the

extent water is then available in the building(s) or on the Site, Contractor may use the District's existing utilities by making prearranged payments to the District for the utilities used by Contractor and all Subcontractors. Contractor shall be responsible for providing temporary facilities required to deliver such utility service from its existing location in the building(s), on the Site, or other location approved by the local water agency, to point of intended use.

- (2) Contractor shall use backflow preventers on water lines at point of connection to District's water supply. Backflow preventers shall comply with requirements of Uniform Plumbing Code.
- (3) Contractor shall make potable water available for human consumption.

C. Sanitary Facilities:

- (1) Contractor shall provide sanitary temporary facilities in no fewer numbers than required by law and such additional facilities as may be directed by the Inspector for the use of all workers. The facilities shall be maintained in a sanitary condition at all times and shall be left at the Site until removal is directed by the Inspector or Contractor completes all other work at the Site.
- (2) Use of toilet facilities in the Work under construction shall not be permitted except by consent of the Inspector and the District.

D. Fire Protection:

- (1) Contractor shall provide and maintain fire extinguishers and other equipment for fire protection. Such equipment shall be designated for use for fire protection only and shall comply with all requirements of the California Fire, State Fire Marshall and/or its designee.
- (2) Where on-site welding and burning of steel is unavoidable, Contractor shall provide protection for adjacent surfaces.

E. Trash Removal:

- (1) Contractor shall provide trash removal on a timely basis. Under no circumstance shall Contractor use District trash service.

F. Field Office:

- (1) If Contractor chooses to provide a field office, it shall be an acceptable construction trailer that is well-lit and ventilated. The construction trailer shall be equipped with shelves, desks, filing cabinet, chairs, and such other items of equipment needed. Trailer and equipment are the property of the Contractor and must be removed from the Site upon completion of the Work.
- (2) Contractor shall provide any additional electric lighting and power required for the trailer. Contractor shall make adequate provisions for heating and cooling as required.

1.03 CONSTRUCTION AIDS:

- A. Plant and Equipment:
 - (1) Contractor shall furnish, operate, and maintain a complete plant for fabricating, handling, conveying, installing, and erecting materials and equipment; and for conveyances for transporting workers. Include elevators, hoists, debris chutes, and other equipment, tools, and appliances necessary for performance of the Work.
 - (2) Contractor shall maintain plant and equipment in safe and efficient operating condition. Damages due to defective plant and equipment, and uses made thereof, shall be repaired by Contractor at no expense to the District.
- B. None of the District's tools and equipment shall be used by Contractor for the performance of the Work.

1.04 BARRIERS AND ENCLOSURES:

- A. Contractor shall obtain the District's written permission for locations and types of temporary barriers and enclosures, including fire-rated materials proposed for use, prior to their installation.
- B. Contractor shall provide and maintain temporary enclosures to prevent public entry and to protect persons using other buildings and portions of the Site and/or Premises, the public, and workers. Contractor shall also protect the Work and existing facilities from the elements, and adjacent construction and improvements, persons, and trees and plants from damage and injury from demolition and construction operations.
- C. Contractor shall provide site access to existing facilities for persons using other buildings and portions of the Site, the public, and for deliveries and other services and activities.
- D. Tree and Plant Protection:
 - (1) Contractor shall preserve and protect existing trees and plants on the Premises that are not designated or required to be removed, and those adjacent to the Premises.
 - (2) Contractor shall provide barriers to a minimum height of 4'-0" around drip line of each tree and plant, around each group of trees and plants, as applicable, in the proximity of demolition and construction operations, or as denoted on the Plans.
 - (3) Contractor shall not park trucks, store materials, perform Work or cross over landscaped areas. Contractor shall not dispose of paint thinners, water from cleaning, plastering or concrete operations, or other deleterious materials in landscaped areas, storm drain systems, or sewers. Plant materials damaged as a result of the performance of the Work shall, at the option of the District and at Contractor's expense, either be replaced with new plant materials equal in size to

those damaged or by payment of an amount representing the value of the damaged materials as determined by the District.

- (4) Contractor shall remove soil that has been contaminated during the performance of the Work by oil, solvents, and other materials which could be harmful to trees and plants, and replace with good soil, at Contractor's expense.
- (5) Excavation around Trees:
 - (a) Excavation within drip lines of trees shall be done only where absolutely necessary and with written permission from the District.
 - (b) Where trenching for utilities is required within drip lines, tunneling under and around roots shall be by hand digging and shall be approved by the District. Main lateral roots and taproots shall not be cut. All roots 2 inches in diameter and larger shall be tunneled under and heavily wrapped with wet burlap so as to prevent scarring or excessive drying. Smaller roots that interfere with installation of new work may be cut with prior approval by the District. Roots must first be cut with a Vermeer, or equivalent, root cutter prior to any trenching.
 - (c) Where excavation for new construction is required within drip line of trees, hand excavation shall be employed to minimize damage to root system. Roots shall be relocated in backfill areas wherever possible. If encountered immediately adjacent to location of new construction, roots shall be cut approximately 6 inches back from new construction.
 - (d) Approved excavations shall be carefully backfilled with the excavated materials approved for backfilling. Backfill shall conform to adjacent grades without dips, sunken areas, humps, or other surface irregularities. Do not use mechanical equipment to compact backfill. Tamp carefully using hand tools, refilling and tamping until Final Acceptance as necessary to offset settlement.
 - (e) Exposed roots shall not be allowed to dry out before permanent backfill is placed. Temporary earth cover shall be provided, or roots shall be wrapped with four layers of wet, untreated burlap and temporarily supported and protected from damage until permanently relocated and covered with backfill.
 - (f) Accidentally broken roots should be sawed cleanly 3 inches behind ragged end.

1.05 SECURITY:

The Contractor shall be responsible for project security for materials, tools, equipment, supplies, and completed and partially completed Work.

1.06 TEMPORARY CONTROLS:

A. Noise Control:

- (1) Contractor acknowledges that adjacent facilities may remain in operation during all or a portion of the Work period, and it shall take all reasonable precautions to minimize noise as required by applicable laws and the Contract Documents.
- (2) Notice of proposed noisy operations, including without limitation, operation of pneumatic demolition tools, concrete saws, and other equipment, shall be submitted to the District a minimum of forty-eight (48) hours in advance of their performance.

B. Noise and Vibration:

- (1) Equipment and impact tools shall have intake and exhaust mufflers.
- (2) Contractor shall cooperate with District to minimize and/or cease the use of noisy and vibratory equipment if that equipment becomes objectionable by its longevity.

C. Dust and Dirt:

- (1) Contractor shall conduct demolition and construction operations to minimize the generation of dust and dirt, and prevent dust and dirt from interfering with the progress of the Work and from accumulating in the Work and adjacent areas including, without limitation, occupied facilities.
- (2) Contractor shall periodically water exterior demolition and construction areas to minimize the generation of dust and dirt.
- (3) Contractor shall ensure that all hauling equipment and trucks carrying loads of soil and debris shall have their loads sprayed with water or covered with tarpaulins, and as otherwise required by local and state ordinance.
- (4) Contractor shall prevent dust and dirt from accumulating on walks, roadways, parking areas, and planting, and from washing into sewer and storm drain lines.

D. Water:

- (1) Contractor shall not permit surface and subsurface water, and other liquids, to accumulate in or about the vicinity of the Premises. Should accumulation develop, Contractor shall control the water or other liquid, and suitably dispose of it by means of temporary pumps, piping, drainage lines, troughs, ditches, dams, or other methods.

E. Pollution:

- (1) No burning of refuse, debris, or other materials shall be permitted on or in the vicinity of the Premises.
- (2) Contractor shall comply with applicable regulatory requirements and anti-pollution ordinances during the conduct of the Work including, without limitation, demolition, construction, and disposal operations.

F. Lighting:

- (1) If portable lights are used after dark, all light must be located so as not to direct light into neighboring property.

1.07 PUBLICITY RELEASES:

- A. Contractor shall not release any information, story, photograph, plan, or drawing relating information about the Project to anyone, including press and other public communications medium, including, without limitation, on website(s) without the written permission of the District.

PART 2 – PRODUCTS Not used.

PART 3 – EXECUTION Not used.

END OF DOCUMENT

CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions;
- B. Special Conditions; and
- C. Temporary Facilities and Controls.

1.02 SECTION INCLUDES:

- A. Administrative and procedural requirements for the following:
 - (1) Salvaging non-hazardous construction waste.
 - (2) Recycling non-hazardous construction waste.
 - (3) Disposing of non-hazardous construction waste.

1.03 DEFINITIONS:

- A. Construction Waste: Building and site improvement materials and other solid waste resulting from construction, remodeling, renovation, or repair operations. Construction waste includes packaging.
- B. Demolition Waste: Building and site improvement materials resulting from demolition or selective demolition operations.
- C. Disposal: Removal off-site of demolition and construction waste and subsequent sale, recycling, reuse, or deposit in landfill or incinerator acceptable to authorities having jurisdiction.
- D. Recycle: Recovery of demolition or construction waste for subsequent processing in preparation for reuse.
- E. Salvage: Recovery of demolition or construction waste and subsequent sale or reuse in another facility.
- F. Salvage and Reuse: Recovery of demolition or construction waste and subsequent incorporation into the Work.

1.04 PERFORMANCE REQUIREMENTS:

- A. General: Develop waste management plan that results in end-of Project rates for salvage/recycling of sixty-five percent (65%) by weight (or by volume, but not a combination) of total waste generated by the Work.

1.05 SUBMITTALS:

- A. Waste Management Plan: Submit waste management plan within 30 days of date established for commencement of the Work.
- B. Waste Reduction Progress Reports: Concurrent with each Application for Payment, submit copies of report. Include the following information:
 - (1) Material category.
 - (2) Generation point of waste.
 - (3) Total quantity of waste in tons or cubic yards.
 - (4) Quantity of waste salvaged, both estimated and actual in tons or cubic yards.
 - (5) Quantity of waste recycled, both estimated and actual in tons or cubic yards.
 - (6) Total quantity of waste recovered (salvaged plus recycled) in tons or cubic yards.
 - (7) Total quantity of waste recovered (salvaged plus recycled) as a percentage of total waste.
- C. Waste Reduction Calculations: Before request for final payment, submit copies of calculated end-of-Project rates for salvage, recycling, and disposal as a percentage of total waste generated by the Work.
- D. Records of Donations: Indicate receipt and acceptance of salvageable waste donated to individuals and organizations. Indicate whether organization is tax exempt.
- E. Records of Sales: Indicate receipt and acceptance of salvageable waste sold to individuals and organizations. Indicate whether organization is tax exempt.
- F. Recycling and Processing Facility Records: Indicate receipt and acceptance of recyclable waste by recycling and processing facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.
- G. Landfill and Incinerator Disposal Records: Indicate receipt and acceptance of waste by landfills and incinerator facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.

- H. Qualification Data: For Waste Management Coordinator.
- I. Submittal procedures and quantities are specified in Document 01 33 00.

1.06 QUALITY ASSURANCE:

- A. Waste Management Coordinator Qualifications: LEED Accredited Professional by U.S. Green Building Council.
- B. Regulatory Requirements: Comply with hauling and disposal regulations of authorities having jurisdiction.
- C. Waste Management Conference: Conduct conference at Project site to comply with requirements. Review methods and procedures related to waste management including, but not limited to, the following:
 - (1) Review and discuss waste management plan including responsibilities of Waste Management Coordinator.
 - (2) Review requirements for documenting quantities of each type of waste and its disposition.
 - (3) Review and finalize procedures for materials separation and verify availability of containers and bins needed to avoid delays.
 - (4) Review procedures for periodic waste collection and transportation to recycling and disposal facilities.
 - (5) Review waste management requirements for each trade.

1.07 WASTE MANAGEMENT PLAN:

- A. General: Develop plan consisting of waste identification, waste reduction work plan, and cost/revenue analysis. Indicate quantities by weight or volume, but use same units of measurement throughout waste management plan.
- B. Waste Identification: Indicate anticipated types and quantities of site-clearing and construction waste generated by the Work. Include estimated quantities and assumptions for estimates.
- C. Waste Reduction Work Plan: List each type of waste and whether it will be salvaged, recycled, or disposed of in landfill or incinerator. Include points of waste generation, total quantity of each type of waste, quantity for each means of recovery, and handling and transportation procedures.
 - (1) Salvaged Materials for Reuse: For materials that will be salvaged and reused in this Project, describe methods for preparing salvaged materials before incorporation into the Work.

- (2) Salvaged Materials for Sale: For materials that will be sold to individuals and organizations, include list of their names, addresses, and telephone numbers.
- (3) Salvaged Materials for Donation: For materials that will be donated to individuals and organizations, include list of their names, addresses, and telephone numbers.
- (4) Recycled Materials: Include list of local receivers and processors and type of recycled materials each will accept. Include names, addresses, and telephone numbers.
- (5) Disposed Materials: Indicate how and where materials will be disposed of. Include name, address, and telephone number of each landfill and incinerator facility.
- (6) Handling and Transportation Procedures: Include method that will be used for separating recyclable waste including sizes of containers, container labeling, and designated location on Project site where materials separation will be located.

PART 2 - PRODUCTS Not Used.

PART 3 - EXECUTION

3.01 PLAN IMPLEMENTATION:

- A. General: Implement approved waste management plan. Provide handling, containers, storage, signage, transportation, and other items as required to implement waste management plan during the entire duration of the Contract.
 - (1) Comply with Document 01 50 00 for operation, termination, and removal requirements.
- B. Training: Train workers, subcontractors, and suppliers on proper waste management procedures, as appropriate for the Work occurring at Project site.
 - (1) Distribute waste management plan to everyone concerned within 3 days of submittal return.
 - (2) Distribute waste management plan to entities when they first begin work on site. Review plan procedures and locations established for salvage, recycling, and disposal.
- C. Site Access and Temporary Controls: Conduct waste management operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.

- (1) Designate and label specific areas of Project site necessary for separating materials that are to be salvaged, recycled, reused, donated, and sold.
- (2) Comply with Document 01 50 00 for controlling dust and dirt, environmental protection, and noise control.

3.02 RECYCLING CONSTRUCTION WASTE:

- A. General: Recycle paper and beverage containers used by on-site workers.
- B. Recycling Incentives: Revenues, savings, rebates, tax credits, and other incentives received for recycling waste materials shall accrue to the Contractor.
- C. Procedures: Separate recyclable waste from other waste materials, trash, and debris. Separate recyclable waste by type at Project site to the maximum extent practical.
 - (1) Provide appropriately marked containers or bins for controlling recyclable waste until they are removed from Project Site. Include list of acceptable and unacceptable materials at each container and bin.
 - (a) Inspect containers and bins for contamination and remove contaminated materials if found.
 - (2) Stockpile processed materials on site without intermixing with other materials. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
 - (3) Stockpile materials away from construction area. Do not store within drip line of remaining trees.
 - (4) Store components off the ground and protect from the weather.
 - (5) Remove recyclable waste off District property and transport to recycling receiver or processor.
- D. Packaging:
 - (1) Cardboard and Boxes: Break down packaging into flat sheets. Bundle and store in a dry location.
 - (2) Polystyrene Packaging: Separate and bag material.
 - (3) Pallets: As much as possible, require deliveries using pallets to remove pallets from Project Site. For pallets that remain on Site, break down pallets into component wood pieces and comply with requirements for recycling wood.
 - (4) Crates: Break down crates into component wood pieces and comply with requirements for recycling wood.

- E. Site-Clearing Wastes: Chip brush, branches, and trees on site.
- F. Wood Materials:
 - (1) Clean Cut-Offs of Lumber: Grind or chip into small pieces.
 - (2) Clean Sawdust: Bag sawdust that does not contain painted or treated wood.

3.03 DISPOSAL OF WASTE:

- A. General: Except for items or materials to be salvaged, recycled, or otherwise reused, remove waste materials from Project Site and legally dispose of them in a landfill or incinerator acceptable to authorities having jurisdiction.
 - (1) Except as otherwise specified, do not allow waste materials that are to be disposed of accumulate on site.
 - (2) Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
- B. Burning: Do not burn waste materials.
- C. Disposal: Transport waste materials off District property and legally dispose of them.

END OF DOCUMENT

FIELD OFFICES

PART 1 – GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions;
- B. Special Conditions; and
- C. Temporary Facilities and Controls.

1.02 SECTION INCLUDES:

- A. Requirements for Field Offices and Field Office Trailers.

1.03 SUMMARY:

- A. General: Contractor shall provide District's Field Office Trailer and contents, for District's use exclusively, during the term of the Contract.
- B. Property: Trailer, furniture, furnishings, equipment, and the like, supplied by the Contractor with the Office Trailer shall remain the property of the Contractor; District property items installed, delivered, and the like by District within the Office Trailer will remain District's property.
- C. Modifications: District reserves the right to modify the trailer or contents, or both, as may be deemed proper by District.
- D. Condition: Trailer and contents shall be clean, neat, substantially finished, in good, proper, and safe condition for use, operation, and the like; the trailer and contents shall not be required to be new.
- E. Installation Timing: Provide safe, fully furnished, functional, proper, complete, and finished trailer properly ready for entire use, within fourteen (14) calendar days of District's notification of the issuance of Notice to Proceed.

1.04 SUBMITTALS:

- A. General: Submit submittals to District in quantity, format, type, and the like, as specified herein.
- B. Office Trailer Data: One (1) copy of manufacturer's descriptive data, technical descriptions, regulatory compliance, industry standards, installation, removal, and maintenance instructions.

- C. Equipment Data: Two (2) copies of manufacturer data for each type of equipment, if directed by District.
- D. Furniture and Furnishings Data: Two (2) copies of manufacturer data for each type of equipment, if directed by District.
- E. Plans: One (1) reproducible copy of appropriately scaled plans of trailer layout. Plans shall include, but not be limited to: lighting; furniture; equipment; telephone and electrical outlets; and the like.
- F. Product Samples: One (1) complete and entire unit of each type, if directed by District.

1.05 QUALITY ASSURANCE

- A. Standards: In the event that provisions of codes, regulations, safety orders, Contract Documents, referenced manufacturer's specifications, manufacturer's instructions, industry standards, and the like, are in conflict, the more restrictive and higher quality shall govern.
- B. Installer: Installer or Installers engaged by Contractor must have a minimum of five (5) years of documented and properly authenticated successful experience of specialization in the installation of the items or systems, or both, specified herein.
- C. Manufacturer: Contractor shall obtain products from nationally and industry recognized Manufacturer with five (5) years minimum, of immediately recent, continuous, documented and properly authenticated successful experience of specialization in the manufacture of the product specified herein.
- D. State Personnel Training: Provide proper training for maintenance and operations, including emergency procedures, and the like, as directed by District.
- E. Units: Shall be sound and free of defects, and shall not include any damage or defect that will impair the safety, installation, performance, or the durability of the entire Office Trailer and appurtenant systems.

1.06 REGULATORY REQUIREMENTS

- A. General: Work shall be executed in accordance with applicable Codes, Regulations, Statutes, Enactments, Rulings, Laws, each authority having jurisdiction, and including, but not limited to, Regulatory Requirements specified herein.
- B. California Building Standards Code ("CBSC").
- C. California Code of Regulations, Title 25, Chapter 3, Sub Chapter 2, Article 3 ("CCR").
- D. Coach Insignia: Trailer shall display California Commercial Coach Insignia; such insignia shall be deemed to show that the trailer is in accordance with the Construction and Fire Safety requirements of CCR.

PART 2 – PRODUCTS

2.01 FIELD OFFICE TRAILER

- A. General: Provide entire Field Office Trailer of type, function, operation, capacity, size, complete with controls, safety devices, accessories, and the like, for proper and durable installation. Partitions, walls, ceiling, and other interior and exterior surfaces shall be appropriately finished, including, but not limited to, trim, painting, wall base, floor covering, suspended or similar ceiling, and the like; provide systems, components, units, nuts, bolts, screws, anchoring devices, fastening devices, washers, accessories, adhesives, sealants, and other items of type, grade, and class required for the particular use, not identified but required for a complete, weather-tight, appropriately operating, and finished installation.
- B. Manufacturers: General Electric Capital Modular Space; The Space Place, Inc.; or equal.
- C. Program: Provide a wheel-mounted trailer with stairs, landings, platforms, ramps, and the like, in good, proper, safe, clean, and properly finished condition; with proper heavy duty locks, and other proper and effective security at all doors, windows, and the like. Trailer shall be maintained in good, proper, safe, clean, and properly finished condition during the Contract.
 - (1) Nominal Trailer Size: Four hundred eighty (480) square feet, minimum.
 - (2) Stairs, Platform: Properly finished stairs, platforms, and ramps.
 - (3) Doors: Two (2), three (3) foot wide exterior doors with locksets; finished ramp, steps, and entry platform at each exterior door.
 - (4) Keys: Submit five (5) keys for each door, window, furniture unit, and the like. There shall be no other key copies or originals available; each key shall be identified for District; and shall be labeled, or tagged
 - (5) Lighting: Sixty-five (65) foot-candles illumination minimum at any point, at thirty (30) inches above finished floor throughout from fluorescent light source, exclusively, or as directed by District.
 - (6) Electrical Outlets: One (1) duplex outlet evenly spaced every twelve (12) linear horizontal feet of wall face, and electrical service ready for use.

2.02 FIELD OFFICE TRAILER ITEMS

- A. General: Provide the Field Office Trailer with the following arranged into two (2) workstations:
 - (1) Desks: Two (2) desks: thirty-six (36) inches by sixty (60) inches; steel, laminated plastic top; locking, one (1) or two (2) file drawers single pedestal; steel; provide five (5) keys to District.

- (2) Tables: Two (2) tables; thirty-six (36) inches by sixty (60) inches; twenty-nine (29) inches high; steel, laminated plastic top tables; one (1) at each desk.
 - (3) Chairs: Two (2) chairs: swivel; steel; with seat cushion and arms; one (1) at each desk.
 - (4) Waste Baskets: Two (2) waste baskets, one at each desk.
- B. Furniture and Equipment: Provide in the space located to effect efficient and logical use.
- (1) File cabinet: One (1); four (4) drawer; lateral; steel locking.
 - (2) Plan Table: One (1) plan table: thirty-six (36) inches deep by seventy-two (72) inches wide by forty-two (42) inches high; adjustable; wood or steel; with lockable plan and pencil drawers.
 - (3) Drafting Stool: One (1) drafting stool; swiveling; steel; padded; adjustable; with footrest and casters.
 - (4) Bookshelf: One (1) bookshelf: thirty-six (36) inches deep by seventy-two (72) inches wide by forty-two (42) inches high; adjustable; wood or steel; with lockable plan and pencil drawer.
 - (5) Plan Rack: One (1) wheel mounted plan rack.
 - (6) Waste Baskets: One (1) large waste basket.
 - (7) Coat/Hat Hanger: Wall mounted with minimum capacity for four (4) garments and ten (10) hats.
 - (8) Document Management System: Shall include an integrated high-volume printer, copier, and facsimile machine, including stand, base, and storage cabinet; and shall include the following features:
 - (a) Type: Laser, dry electrostatic transfer, plain paper, digital, multi-function imaging system.
 - (b) Network: Ethernet or Token Ring network ready, Plug-and-Play.
 - (c) Print, send/receive facsimile from any connected workstation.
 - (d) Resolution: Six hundred (600) dots per inch by six hundred (600) dots per inch, minimum.
 - (e) Print Speed: Twenty (20) pages per minute, minimum.
 - (f) Copies: Twenty (20) copies per minute, minimum.
 - (g) Document Handler: Forty (40) sheet, minimum

- (h) Collator: Forty (40) bin, minimum, with stapling.
- (i) Duplexing: Capable.
- (j) Paper Size: Capable of handling paper sizes to eleven (11) inches by seventeen (17) inches.
- (k) Paper Cassettes: One (1) each for eight and one half (8.5) inches by eleven (11) inches, eight and one half (8.5) inches by fourteen (14) inches, and eleven (11) inches by seventeen (17) inches paper sizes; minimum two hundred fifty (250) sheets per cassette.
- (l) Reduction/Enlargement: Capable of reduction to twenty-five percent (25%) and enlargement to two hundred percent (200%).
- (m) Facsimile Electronic Storage: Capable of storing minimum of fifty (50) speed dial numbers, group faxing and broadcast faxing.
- (n) Facsimile Scanning: Capable of scanning into memory a minimum of one hundred (100) pages with maximum scan time of three (3) seconds per page.
- (o) Halftone: Sixty-four (64) levels.
- (p) Redial: Automatic and Manual.
- (9) Maintenance: Contractor shall purchase service agreements for each unit of equipment for the duration of the project plus two (2) months, and shall maintain all equipment in proper working condition. Service agreements shall include provision for replacement of toner cartridges and other items required to effect proper unit use. Service agreements shall also provide for:
 - (a) Unlimited Service Calls.
 - (b) Same Day Response.
 - (c) All parts, labor, preventative maintenance and mileage.
 - (d) All chemicals, such as toner, fixing agent, and the like.
 - (e) System training and setup.
- (10) Portable Toilets: Two (2); each shall include a urinal; each unit shall be a properly enclosed chemical unit conforming to ANSI Z4.3.
 - (a) Location: As directed by District.
 - (b) Maintenance: Maintain each unit and surrounding areas in a clean, hygienic and orderly manner, at all time. Empty, clean,

and sanitize each unit each day at a location and time as directed by District.

- (c) Removal: Relocate, or remove from the site, each Portable Toilet. Upon such directive by District, the Contractor shall forthwith relocate or remove each Portable Toilet and submit the affected areas to a condition which existed prior to the installation of each Portable Toilet, within three (3) calendar days, or as directed by District in writing, at no cost to District.

2.03 UTILITY AND SERVICES

- A. Telephone Service: Contractor shall provide and interface the entire telephone service, and shall properly and timely pay for telephone service for District's non-long-distance use.
- B. Electrical Service: Provide all proper connections and continuously pay for service for the duration of the Work.

2.04 FINISHES

- A. General: Manufacturer standard finish system over surfaces properly cleaned, pretreated, and prepared to obtain proper bond; all visible surfaces shall be coated.
- B. Finish: Color as selected by District from manufacturer standard palette.

PART 3 – EXECUTION

3.01 INSTALLATION

- A. General: Properly prepare area and affected items to receive the Work. Set Work accurately in location, alignment, and elevation; rigidly, securely, and firmly anchor to appropriate structure; install plumb, straight, square, level, true, without racking, rigidly anchored to proper solid blocking, substrate, and the like; provide appropriate type and quantity of reinforcements, fasteners, adhesives, self-adhesive and other tapes; lubricants, coatings, accessories, and the like, as required for a complete, structurally rigid, stable, sound, and appropriately finished installation, in accordance with manufacturer's published instructions, and as indicated. The more restrictive and higher quality requirement shall govern. Moving parts shall be properly secured, without binding, looseness, noise, and the like.
- B. Installation: Install in accordance with 25 CCR 3.2.3 and as directed by District; jack up trailer and level both ways; mount on proper concrete piers with all load off wheels; provide required tie down and accessories per Section 4368 of referenced CCR, and as directed by District.
- C. Rejected Work: Work, materials, unit, items, systems, and the like, not accepted by District shall be deemed rejected, and shall forthwith be removed and replaced with proper and new Work, materials, unit, items, systems, and the like at no cost to District.

- D. Standard: Comply with manufacturer's published instructions, or with instructions as shown or indicated; the more restrictive and higher quality requirement shall govern.
- E. Location: As directed by District.
- F. Fire Resistance: Construct and install in accordance with UL requirements.
- G. Maintenance: Contractor shall maintain trailer and adjacent areas in a safe, clean and hygienic condition throughout the duration of the Work, and as directed by District. Properly repair or replace furniture or other items, as directed by District. Properly remove unsafe, damaged, or broken furniture, or similar items, and replace with safe and proper items. Contractor shall pay cost of all services, repair, and maintenance, or replacement of each item.
- H. Janitorial Service: Provide professional janitorial services, including, but not limited to, trash, waste paper baskets, fill paper dispensers; clean and dust all furniture, files, and the like; sweep and mop resilient and similar flooring; and vacuum carpeting and similar flooring.
 - (1) Frequency: Two (2) times per week, minimum.
- I. Removal: Properly remove the Office Trailer and contents from the Site upon completion of the Contract, or as directed by District in writing. Forthwith properly patch and repair affected areas; replace damaged items with new items. Carefully and properly inventory, clean, pack, store, and protect District property; submit District property to District at a date, time and location as directed by District.

END OF DOCUMENT

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: VOC restrictions for product categories listed below under Article "DEFINITIONS" and in compliance with the following.
 - 1. California Code of Regulations, Title 24, Part 11 California Green Building Standards Code.
 - 2. Local Agency.
 - 3. No Rating System is applicable.
- B. Products of each category that are installed in the project must comply; applicable laws and ordinances do not allow for partial compliance.
- C. Listing of a product in these Specifications shall not be construed as a solicitation or requirement to use any product or combination of products in violation of the requirements of South Coast Air Quality Management District Rule No.1168, as described in Rule 1168(g).
 - 1. If a listed product does not meet the requirements of this rule, request approval for use of an alternate product by the same or another manufacturer meeting the requirements of this rule.
 - 2. Do not use products which do not meet the requirements of this rule.

1.2 RELATED REQUIREMENTS

- A. Divisions 01 through 33 contain related requirements specific to the work of each of these Sections. Requirements may or may not include reference to this Section.
- B. Section 01 8113, Sustainable Design Requirements, for CAL-Green general requirements and procedures.

1.3 REFERENCES

- A. California Green Building Standards Code (CALGreen), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. Low-Emitting Materials Product List; California Collaborative for High Performance Schools (CHPS); current edition at www.chps.net/.
- C. CRI (GLCC) - Green Label Testing Program - Approved Product Categories for Carpet Cushion; Carpet and Rug Institute; current edition.
- D. CRI (GLP) - Green Label Plus Carpet Testing Program - Approved Products; Carpet and Rug Institute; current edition.
- E. GEI (SCH) - GREENGUARD "Children and Schools" Certified Products; GREENGUARD Environmental Institute; current listings at www.greenguard.org.

VOLATILE ORGANIC COMPOUND (VOC) RESTRICTIONS

SECTION 01 6116

3595001

- F. GreenSeal GS-36 - Commercial Adhesives; Green Seal, Inc.
- G. SCAQMD 1168 - South Coast Air Quality Management District Rule No.1168; current edition; www.aqmd.gov.
- H. SCS (CPD) - SCS Certified Products; Scientific Certification Systems; current listings at www.scs-certified.com.

1.4 DEFINITIONS

- A. VOC-Restricted Products: Products of each of the following categories when installed or applied on-site:
 - 1. Adhesives, sealants, and sealer coatings, regardless of specification Section or Division.
 - 2. Paints and coatings.
 - 3. Carpet and resilient flooring.
 - 4. Composite wood products; plywood, particleboard, wood fiberboard.
- B. Adhesives: Gunnable, trowelable, liquid-applied, and aerosol adhesives, whether specified or not; including flooring adhesives, resilient base adhesives, and pipe jointing adhesives.
- C. Sealants: Gunnable, trowelable, and liquid-applied joint sealants and sealant primers, whether specified or not; including firestopping sealants and duct joint sealers.

1.5 SUBMITTAL REQUIREMENTS

- A. Product Data: For each VOC-restricted product used in the project, submit product data showing compliance, except when another type of evidence of compliance is required.
- B. Verification of Compliance: Submit for each different product in each applicable category.
 - 1. Identify evidence submittals with the words "CALGreen VOC Compliance Report".
- C. Installer Certifications for Accessory Materials:
 - 1. Require each installer of any type of product, not just the products for which VOC restrictions are specified, to certify that either 1) no adhesives, joint sealants, paints, coatings, or composite wood or agrifiber products have been used in the installation of their products, or 2) that such products used comply with these requirements.
 - 2. Use the form following at the end of Part 3 in this Section for Installer certifications.

1.6 QUALITY ASSURANCE

- A. Manufacturer's Testing Agency Qualifications: Independent firm specializing in performing testing and inspections of the type specified in this Section.

VOLATILE ORGANIC COMPOUND (VOC) RESTRICTIONS
SECTION 01 6116
3595001

PART 2 - PRODUCTS

2.1 MATERIALS

A. General:

1. Provide products conforming to local, State and Federal government requirements limiting the amount of volatile organic compounds contained in the product, for its intended application. If specified product exceeds current requirement, provide conforming product at no additional cost.
2. Provide only products having volatile organic compound (VOC) content not greater than required by South Coast Air Quality Management District Rule No.1168 and less where required by code.
3. Products are specified in multiple Sections throughout these Specifications.

B. Composite Wood Products: Comply with CALGreen Section 5.504 and Table 5.504.4.5 formaldehyde limits for hardwood plywood, particleboard, and medium density fiberboard composite wood products used on the interior and exterior of the building.

1. Verification of Compliance: Acceptable types are:
 - a. Certification by manufacturer that product complies with requirements.
 - b. Published product data showing compliance with requirements.
 - c. Chain of custody certifications.
 - d. Product labeled and invoiced as meeting the Composite Wood Products regulation (CCR, Title 17, Section 93120, et seq.).
 - e. Products marked as meeting the PS-1 or PS-2 standards of the Engineered Wood Association, the Australian AS/NZS 2269, or European 636 3S standards.
 - f. Other method acceptable to enforcing agency.

Table 5.504.4.5 FORMALDEHYDE LIMITS	
Maximum Formaldehyde Emissions in Parts per Million	
Product	Current Limit
Hardwood plywood veneer core	0.05
Hardwood plywood composite core	0.05
Particleboard	0.09
Medium density fiberboard	0.11
Thin medium density fiberboard ¹	0.13
Note 1: Thin medium density fiberboard has a maximum thickness of 5/16 inch (8 mm).	

C. Joint Sealants: Comply with CALGreen Section 5.504 and Table 5.504.4.2.

1. Verification of Compliance: Acceptable types are:
 - a. Report of laboratory testing performed in accordance with requirements.
 - b. Published product data showing compliance with requirements.

VOLATILE ORGANIC COMPOUND (VOC) RESTRICTIONS
SECTION 01 6116
3595001

- c. Certification by manufacturer that product complies with requirements.
- 2. Products used shall comply with the following limits.

Table 5.504.4.2 SEALANT VOC LIMIT	
Less Water and Less Exempt Compounds in Grams per Liter	
Sealant	Current VOC Limit
Architectural	250
Marine Deck	760
Non-Membrane Roof	300
Roadway	250
Single-Ply Roof Membrane	450
Other	420
Sealant Primers	Current VOC Limit
Architectural	
Non-Porous	250
Porous	775
Modified Bituminous	500
Marine Deck	760
Other	750
For low-solid adhesives or sealants the VOC limit is expressed in grams per liter of material; for all other adhesives and sealants, VOC limits are expressed as grams of VOC per liter of adhesive or sealant less water and less exempt compounds.	

- D. Paints and Coatings: Comply with CALGreen Section 5.504 and Table 5.504.4.3 based on the California Air Resources Board, Architectural Coatings Suggested Control Measure.
 - 1. Determination of VOC Content: Testing and calculation in accordance with 40 CFR 59, Subpart D (EPA Method 24), exclusive of colorants added to a tint base and water added at Project site; or other method acceptable to authorities having jurisdiction.
 - a. Verification of Compliance: Acceptable types are:
 - 1) Report of laboratory testing performed in accordance with requirements.
 - 2) Published product data showing compliance with requirements.
 - 3) Certification by manufacturer that product complies with requirements.
 - 2. Provide coatings that comply with the most stringent requirements specified in the following:
 - a. 40 CFR 59, Subpart D--National Volatile Organic Compound Emission Standards for Architectural Coatings.
 - b. South Coast Air Quality Management District Rule No.1168.
 - 3. Products used shall comply with the following limits.

VOLATILE ORGANIC COMPOUND (VOC) RESTRICTIONS
SECTION 01 6116
3595001

Table 5.504.4.3 VOC CONTENT LIMITS FOR ARCHITECTURAL COATINGS (See Notes 2 & 3 below)	
Grams of VOC per Liter of Coating, less water and less exempt compounds	
Coating Category	Current VOC Limit 1/1/2012
Flat Coatings	50
Non-Flat Coatings	100
Non-Flat High Gloss Coatings	150
Specialty Coatings	
Aluminum Roof Coatings	400
Basement Specialty Coatings	400
Bituminous Roof Coatings	50
Bituminous Roof Primers	350
Bond Breakers	350
Concrete Curing Compounds	350
Concrete / Masonry Sealers	100
Driveway Sealers	50
Dry Fog Coatings	150
Faux Finishing Coatings	350
Fire Resistive Coatings	350
Floor Coatings	100
Form-Release Compounds	250
Graphic Arts Coatings (Sign Paints)	500
High-Temperature Coatings	420
Industrial Maintenance Coatings	250
Low Solids Coatings (See Note 1 below)	120
Magnesite Cement Coatings	450
Mastic Texture Coatings	100
Metallic Pigmented Coatings	500
Multicolor Coatings	250
Pretreatment Wash Primers	420
Primers, Sealers and Undercoaters	100
Reactive Penetrating Sealers	350
Recycled Coatings	250
Roof Coatings	50
Rust Preventative Coatings	250
Shellacs:	
Clear	730
Opaque	550
Specialty Primers, Sealers and Undercoaters	100
Stains	250
Stone Consolidants	450
Swimming Pool Coatings	340
Traffic Marking Coatings	100
Waterproofing Membranes	250
Wood Coatings	275

VOLATILE ORGANIC COMPOUND (VOC) RESTRICTIONS
SECTION 01 6116
3595001

Table 5.504.4.3 VOC CONTENT LIMITS FOR ARCHITECTURAL COATINGS (See Notes 2 & 3 below)	
Grams of VOC per Liter of Coating, less water and less exempt compounds	
Coating Category	Current VOC Limit 1/1/2012
Wood Preservatives	350
Zinc Rich Primers	340
Note 1: Grams of VOC per liter of coating including water and including exempt compounds	
Note 2: Not Applicable	
Note 3: Values in this table are derived from those specified by the California Air Resources Board, Architectural Coatings Suggested Control Measure, February 1, 2008. More information is available from the Air Resources Board.	

4. Restricted Components: In addition to the specified VOC limits, paints and coatings shall not contain any of the following:
- Acrolein.
 - Acrylonitrile.
 - Antimony.
 - Benzene.
 - Butyl benzyl phthalate.
 - Cadmium.
 - Di (2-ethylhexyl) phthalate.
 - Di-n-butyl phthalate.
 - Di-n-octyl phthalate.
 - 1,2-dichlorobenzene.
 - Diethyl phthalate.
 - Dimethyl phthalate.
 - Ethylbenzene.
 - Formaldehyde.
 - Hexavalent chromium.
 - Isophorone.
 - Lead.
 - Mercury.
 - Methyl ethyl ketone.
 - Methyl isobutyl ketone.
 - Methylene chloride.
 - Naphthalene.
 - Toluene (methylbenzene).
 - 1,1,1-trichloroethane.

- y. Vinyl chloride.

PART 3 - EXECUTION

3.1 FIELD QUALITY CONTROL

- A. Owner reserves the right to reject non-compliant products, whether installed or not, and require their removal and replacement with compliant products at no extra cost to Owner.
- B. Additional costs to restore indoor air quality, including fines by authorities, due to installation of non-compliant products shall be borne by Contractor.

3.2 CERTIFICATION FORM

- A. Use of this Form:
 - 1. Because installers are allowed and directed to choose accessory materials suitable for the applicable installation, there is a possibility that such accessory materials might contain VOC content in excess of that permitted, especially where such materials have not been explicitly specified.
 - 2. Contractor is required to obtain and submit this Form from each installer of work on this project.
 - 3. For each product category listed, circle the correct words in brackets: either [HAS] or [HAS NOT].
 - 4. If these accessory materials have been used, attach to this form product data and MSDS sheet for each such product.

(The Remainder of this Page is Intentionally Left Blank)

VOLATILE ORGANIC COMPOUND (VOC) RESTRICTIONS
SECTION 01 6116
3595001

ACCESSORY MATERIAL VOC CONTENT CERTIFICATION FORM

IDENTIFICATION:

Project Name: _____

Project No.: _____

Architect: _____

PRODUCT CERTIFICATION: I certify that the installation work of my firm on this project:

1. [HAS] [HAS NOT] required the use of any ADHESIVES.
2. [HAS] [HAS NOT] required the use of any JOINT SEALANTS.
3. [HAS] [HAS NOT] required the use of any PAINTS OR COATINGS.
4. [HAS] [HAS NOT] required the use of any COMPOSITE WOOD or AGRIFIBER PRODUCTS.

Product data and MSDS sheets are attached.

CERTIFIED BY (Installer/Manufacturer/Supplier Firm):

Firm Name: _____

Print Name: _____

Signature: _____

Title: _____ (officer of company)

Date: _____

END OF SECTION

*p:\sacramento\3595 tracy unified school district\001-000_villalovoz es new shade structures\08 specifications\06 spec\04
final\hirsch\01 6116_volatile organic compound (voc) restrictions.docx
Last Updated: January 18, 2022*

SECTION 01 66 00

PRODUCT DELIVERY, STORAGE AND HANDLING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Site Access, Conditions and Requirements;
- B. Special Conditions.

1.02 PRODUCTS

- A. Products are as defined in the General Conditions.
- B. Contractor shall not use and/or reuse materials and/or equipment removed from existing Premises, except as specifically permitted by the Contract Documents.
- C. Contractor shall provide interchangeable components of the same manufacturer, for similar components.

1.03 TRANSPORTATION AND HANDLING

- A. Contractor shall transport and handle Products in accordance with manufacturer's instructions.
- B. Contractor shall promptly inspect shipments to confirm that Products comply with requirements, quantities are correct, and products are undamaged.
- C. Contractor shall provide equipment and personnel to handle Products by methods to prevent soiling, disfigurement, or damage.

1.04 STORAGE AND PROTECTION

- A. Contractor shall store and protect Products in accordance with manufacturer's instructions, with seals and labels intact and legible. Contractor shall store sensitive products in weather-tight, climate controlled enclosures.
- B. For exterior storage of fabricated Products, Contractor shall place on sloped supports, above ground.
- C. Contractor shall provide off-site storage and protection when Site does not permit on-site storage or protection.

- D. Contractor shall cover products subject to deterioration with impervious sheet covering and provide ventilation to avoid condensation.
- E. Contractor shall store loose granular materials on solid flat surfaces in a well-drained area and prevent mixing with foreign matter.
- F. Contractor shall provide equipment and personnel to store Products by methods to prevent soiling, disfigurement, or damage.
- G. Contractor shall arrange storage of Products to permit access for inspection and periodically inspect to assure Products are undamaged and are maintained under specified conditions.

PART 2 – PRODUCTS Not Used.

PART 3 - EXECUTION Not Used.

END OF DOCUMENT

CUTTING AND PATCHING

PART 1 – GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Inspector, Inspections, and Tests, Integration of Work, Nonconforming Work, and Correction of Work, and Uncovering Work;
- B. Special Conditions;
- C. Imported Materials Certification.

1.02 CUTTING AND PATCHING:

- A. Contractor shall be responsible for all cutting, fitting, and patching, including associated excavation and backfill, required to complete the Work or to:
 - (1) Make several parts fit together properly.
 - (2) Uncover portions of Work to provide for installation of ill-timed Work.
 - (3) Remove and replace defective Work.
 - (4) Remove and replace Work not conforming to requirements of Contract Documents.
 - (5) Remove Samples of installed Work as specified for testing.
 - (6) Provide routine penetrations of non-structural surfaces for installation of piping and electrical conduit.
 - (7) Attaching new materials to existing remodeling areas – including painting (or other finishes) to match existing conditions.
- B. In addition to Contract requirements, upon written instructions from the District, Contractor shall uncover Work to provide for observations of covered Work in accordance with the Contract Documents; remove samples of installed materials for testing as directed by District; and remove Work to provide for alteration of existing Work.
- C. Contractor shall not cut or alter Work, or any part of it, in such a way that endangers or compromises the integrity of the Work, the Project, or work of others.

1.03 SUBMITTALS:

- A. Prior to any cutting or alterations that may affect the structural safety of Project, or work of others, and well in advance of executing such cutting or alterations, Contractor shall submit written notice to District pursuant to the applicable notice provisions of the Contract Documents, requesting consent to proceed with the cutting or alteration, including the following:
 - (1) The work of the District or other trades.
 - (2) Structural value or integrity of any element of Project.
 - (3) Integrity or effectiveness of weather-exposed or weather-resistant elements or systems.
 - (4) Efficiency, operational life, maintenance or safety of operational elements.
 - (5) Visual qualities of sight-exposed elements.
- B. Contractor's Request shall also include:
 - (1) Identification of Project.
 - (2) Description of affected Work.
 - (3) Necessity for cutting, alteration, or excavations.
 - (4) Effects of Work on District, other trades, or structural or weatherproof integrity of Project.
 - (5) Description of proposed Work:
 - (a) Scope of cutting, patching, alteration, or excavation.
 - (b) Trades that will execute Work.
 - (c) Products proposed to be used.
 - (d) Extent of refinishing to be done.
 - (6) Alternates to cutting and patching.
 - (7) Cost proposal, when applicable.
 - (8) The scheduled date the Contractor intends to perform the Work and the duration of time to complete the Work.
 - (9) Written permission of District or other District contractor(s) whose work will be affected.

1.04 QUALITY ASSURANCE:

- A. Contractor shall ensure that cutting, fitting, and patching shall achieve security, strength, weather protection, appearance for aesthetic match, efficiency, operational life, maintenance, safety of operational elements, and the continuity of existing fire ratings.
- B. Contractor shall ensure that cutting, fitting, and patching shall successfully duplicate undisturbed adjacent profiles, materials, textures, finishes, colors, and that materials shall match existing construction. Where there is dispute as to whether duplication is successful or has been achieved to a reasonable degree, the District's decision shall be final.

1.05 PAYMENT FOR COSTS:

- A. Cost caused by ill-timed or defective Work or Work not conforming to Contract Documents, including costs for additional services of the District, its consultants, including but not limited to the Construction Manager, the Architect, the Project Inspector(s), Engineers, and Agents, will be paid by Contractor and/or deducted from the Contract by the District.
- B. District shall only pay for cost of Work if it is part of the original Contract Price or if a change has been made to the contract in compliance with the provisions of the General Conditions. Cost of Work performed upon instructions from the District, other than defective or nonconforming Work, will be paid by District on approval of written Change Order. Contractor shall provide written cost proposals prior to proceeding with cutting and patching.

PART 2 - PRODUCTS

2.01 MATERIALS:

- A. Contractor shall provide for replacement and restoration of Work removed. Contractor shall comply with the Contract Documents and with the Industry Standard(s), for the type of Work, and the Specification requirements for each specific product involved. If not specified, Contractor shall first recommend a product of a manufacturer or appropriate trade association for approval by the District.
- B. Materials to be cut and patched include those damaged by the performance of the Work.

PART 3 – EXECUTION

3.01 INSPECTION:

- A. Contractor shall inspect existing conditions of the Site and the Work, including elements subject to movement or damage during cutting and patching, excavating and backfilling. After uncovering Work, Contractor shall inspect conditions affecting installation of new products.

- B. Contractor shall report unsatisfactory or questionable conditions in writing to District as indicated in the General Conditions and shall proceed with Work as indicated in the General Conditions by District.

3.02 PREPARATION:

- A. Contractor shall provide shoring, bracing and supports as required to maintain structural integrity for all portions of the Project, including all requirements of the Project.
- B. Contractor shall provide devices and methods to protect other portions of Project from damage.
- C. Contractor shall, provide all necessary protection from weather and extremes of temperature and humidity for the Project, including without limitation, any work that may be exposed by cutting and patching Work. Contractor shall keep excavations free from water.

3.03 ERECTION, INSTALLATION AND APPLICATION:

- A. With respect to performance, Contractor shall:
 - (1) Execute fitting and adjustment of products to provide finished installation to comply with and match specified tolerances and finishes.
 - (2) Execute cutting and demolition by methods that will prevent damage to other Work, and provide proper surfaces to receive installation of repairs and new Work.
 - (3) Execute cutting, demolition excavating, and backfilling by methods that will prevent damage to other Work and damage from settlement.
- B. Contractor shall employ original installer or fabricator to perform cutting and patching for:
 - (1) Sight-exposed finished surfaces.
- C. Contractor shall execute fitting and adjustment of products to provide a finished installation to comply with specified products, functions, tolerances, and finishes as shown or specified in the Contract Documents including, without limitation, the Drawings and Specifications.
- D. Contractor shall fit Work airtight to pipes, sleeves, conduit, and other penetrations through surfaces. Contractor shall conform to all Code requirements for penetrations or the Drawings and Specifications, whichever calls for a higher quality or more thorough requirement. Contractor shall maintain integrity of both rated and non-rated fire walls, ceilings, floors, etc.
- E. Contractor shall restore Work which has been cut or removed. Contractor shall install new products to provide completed Work in accordance with requirements of the Contract Documents and as required to match surrounding areas and surfaces.

- F. Contractor shall refinish all continuous surfaces to nearest intersection as necessary to match the existing finish to any new finish.

END OF DOCUMENT

ALTERATION PROJECT PROCEDURES

PART 1 – GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Integration of Work, Purchase of Materials and Equipment, Uncovering of Work and Non-conforming Work and Correction of Work and Trenches;
- B. Special Conditions.

PART 2 - PRODUCTS

2.01 PRODUCTS FOR PATCHING AND EXTENDING WORK:

- A. New Materials: As specified in the Contract Documents including, without limitation, in the Specifications, Contractor shall match existing products, conditions, and work for patching and extending work.
- B. Type and Quality of Existing Products: Contractor shall determine by inspection, by testing products where necessary, by referring to existing conditions and to the Work as a standard.

PART 3 - EXECUTION

3.01 EXAMINATION:

- A. Contractor shall verify that demolition is complete and that areas are ready for installation of new Work.
- B. By beginning restoration Work, Contractor acknowledges and accepts the existing conditions.

3.02 PREPARATION:

- A. Contractor shall cut, move, or remove items as necessary for access to alterations and renovation Work. Contractor shall replace and restore these at completion.
- B. Contractor shall remove unsuitable material not as salvage unless otherwise indicated in the Contract Documents. Unsuitable material may include, without limitation, rotted wood, corroded metals, and deteriorated masonry and concrete. Contractor shall replace materials as specified for finished Work.

- C. Contractor shall remove debris and abandoned items from all areas of the Site and from concealed spaces.
- D. Contractor shall prepare surface and remove surface finishes to provide for proper installation of new Work and finishes.

3.03 INSTALLATION:

- A. Contractor shall coordinate Work of all alternations and renovations to expedite completion and to accommodate District occupancy.
- B. Designated Areas and Finishes: Contractor shall complete all installations in all respects, including operational, and electrical work.
- C. Contractor shall remove, cut, and patch Work in a manner to minimize damage and to provide a means of restoring Products and finishes to original or specified condition.
- D. Contractor shall refinish visible existing surfaces to remain to specified condition for each material, with a neat and square or straight transition to adjacent finishes.
- E. Contractor shall install products as specified in the Contract Documents, including without limitation, the Specifications.

3.04 TRANSITIONS:

- A. Where new Work abuts or aligns with existing, Contractor shall perform a smooth and even transition. Patched Work must match existing adjacent work in texture and appearance.
- B. When finished surfaces are cut so that a smooth transition with new Work is not possible, Contractor shall terminate existing surface along a straight line at a natural line of division and make a recommendation for resolution to the District and the Architect for review and approval.

3.05 ADJUSTMENTS:

- A. Where a change of plane of 1/4 inch or more occurs, Contractor shall submit a recommendation for providing a smooth transition to the District and the Architect for review and approval.
- B. Contractor shall fit Work at penetrations of surfaces.

3.06 REPAIR OF DAMAGED SURFACES:

- A. Contractor shall patch or replace portions of existing surfaces, which are damaged, lifted, discolored, or showing other imperfections, in the area where the Work is performed.
- B. Contractor shall repair substrate prior to patching finish.

3.07 CULTIVATED AREAS AND OTHER SURFACE IMPROVEMENTS:

- A. Cultivated or planted areas and other surface improvements which are damaged by actions of the Contractor shall be restored by Contractor to their original condition or better, where indicated.
- B. Contractor shall protect and replace, if damaged, all existing guard posts, barricades, and fences.
- C. Contractor shall give special attention to avoid damaging or killing trees, bushes and/or shrubs on the Premises and/or identified in the Contract Documents, including without limitation, the Drawings.

3.08 FINISHES:

- A. Contractor shall finish surfaces as specified in the Contract Documents, including without limitations, the provisions of all Divisions of the Specifications.
- B. Contractor shall finish patches to produce uniform finish and texture over entire area. When finish cannot be matched, Contractor shall refinish entire surface to nearest intersections.

3.09 CLEANING:

- A. Contractor shall continually clean the Site and the Premises as indicated in the Contract Documents, including without limitation, the provisions in the General Conditions and the Specifications regarding cleaning.

END OF DOCUMENT

CONTRACT CLOSEOUT AND FINAL CLEANING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Completion of Work;
- B. Special Conditions;
- C. Temporary Facilities and Controls.

1.02 CLOSEOUT PROCEDURES

Contractor shall comply with all closeout provisions as indicated in the General Conditions.

1.03 FINAL CLEANING

- A. Contractor shall execute final cleaning prior to final inspection.
- B. Contractor shall clean interior and exterior glass and all surfaces exposed to view; remove temporary labels, tape, stains, and foreign substances, polish transparent and glossy surfaces, wax and polish new vinyl floor surfaces, vacuum carpeted and soft surfaces.
- C. Contractor shall clean equipment and fixtures to a sanitary condition.
- D. Contractor shall replace filters of operating equipment.
- E. Contractor shall clean debris from roofs, gutters, down spouts, and drainage systems.
- F. Contractor shall clean Site, sweep paved areas, and rake clean landscaped surfaces.
- G. Contractor shall remove waste and surplus materials, rubbish, and construction facilities from the Site and surrounding areas.

1.04 ADJUSTING

Contractor shall adjust operating products and equipment to ensure smooth and unhindered operation.

1.05 RECORD DOCUMENTS AND SHOP DRAWINGS

- A. Contractor shall legibly mark each item to record actual construction, including:
 - (1) Measured depths of foundation in relation to finish floor datum.
 - (2) Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permit surface improvements.
 - (3) Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.
 - (4) Field changes of dimension and detail.
 - (5) Details not on original Contract Drawings
 - (6) Changes made by modification(s).
 - (7) References to related Shop Drawings and modifications.
- B. Contractor will provide one set of Record Drawings to District.
- C. Contractor shall submit all required documents to District and/or Architect prior to or with its final Application for Payment.

1.06 INSTRUCTION OF DISTRICT PERSONNEL

- A. Before final inspection, at agreed upon times, Contractor shall instruct District's designated personnel in operation, adjustment, and maintenance of products, equipment, and systems.
- B. For equipment requiring seasonal operation, Contractor shall perform instructions for other seasons within six months or by the change of season.
- C. Contractor shall use operation and maintenance manuals as basis for instruction. Contractor shall review contents of manual with personnel in detail to explain all aspects of operation and maintenance.
- D. Contractor shall prepare and insert additional data in Operation and Maintenance Manual when the need for such data becomes apparent during instruction.
- E. Contractor shall review contents of manual with personnel in detail to explain all aspects of operation and maintenance.

1.07 SPARE PARTS AND MAINTENANCE MATERIALS

- A. Contractor shall provide products, spare parts, maintenance, and extra materials in quantities specified in the Specifications and in Manufacturer's recommendations.

- B. Contractor shall provide District with all required Operation and Maintenance Data at one time. Partial or piecemeal submissions of Operation and Maintenance Data will not be accepted.

PART 2 – PRODUCTS Not Used.

PART 3 – EXECUTION Not Used.

END OF DOCUMENT

OPERATION AND MAINTENANCE DATA

PART 1 – GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Completion of the Work;
- B. Special Conditions.

1.02 QUALITY ASSURANCE:

Contractor shall prepare instructions and data by personnel experienced in maintenance and operation of described products.

1.03 FORMAT:

- A. Contractor shall prepare data in the form of an instructional manual entitled "OPERATIONS AND MAINTENANCE MANUAL & INSTRUCTIONS" ("Manual").
- B. Binders: Contractor shall use commercial quality, 8-1/2 by 11 inch, three-side rings, with durable plastic covers; two inch maximum ring size. When multiple binders are used, Contractor shall correlate data into related consistent groupings.
- C. Cover: Contractor shall identify each binder with typed or printed title "OPERATION AND MAINTENANCE MANUAL & INSTRUCTIONS"; and shall list title of Project and identify subject matter of contents.
- D. Contractor shall arrange content by systems process flow under section numbers and sequence of Table of Contents of the Contract Documents.
- E. Contractor shall provide tabbed fly leaf for each separate product and system, with typed description of product and major component parts of equipment.
- F. Text: The content shall include Manufacturer's printed data, or typewritten data on 24 pound paper.
- G. Drawings: Contractor shall provide with reinforced punched binder tab and shall bind in with text; folding larger drawings to size of text pages.

1.04 CONTENTS, EACH VOLUME:

- A. Table of Contents: Contractor shall provide title of Project; names, addresses, and telephone numbers of the Architect, any engineers, subconsultants, Subcontractor(s), and Contractor with name of responsible parties; and schedule of products and systems, indexed to content of the volume.

- B. For Each Product or System: Contractor shall list names, addresses, and telephone numbers of Subcontractor(s) and suppliers, including local source of supplies and replacement parts.
- C. Product Data: Contractor shall mark each sheet to clearly identify specific products and component parts, and data applicable to installation. Delete inapplicable information.
- D. Drawings: Contractor shall supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams. Contractor shall not use Project Record Documents as maintenance drawings.
- E. Text: Contractor shall include any and all information as required to supplement product data. Contractor shall provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions.
- F. Warranties and Bonds: Contractor shall bind in one copy of each.

1.05 MANUAL FOR MATERIALS AND FINISHES:

- A. Building Products, Applied Materials, and Finishes: Contractor shall include product data, with catalog number, size, composition, and color and texture designations. Contractor shall provide information for re-ordering custom manufactured products.
- B. Instructions for Care and Maintenance: Contractor shall include Manufacturer's recommendations for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.
- C. Moisture Protection and Weather Exposed Products: Contractor shall include product data listing applicable reference standards, chemical composition, and details of installation. Contractor shall provide recommendations for inspections, maintenance, and repair.
- D. Additional Requirements: Contractor shall include all additional requirements as specified in the Specifications.
- E. Contractor shall provide a listing in Table of Contents for design data, with tabbed fly sheet and space for insertion of data.

1.06 MANUAL FOR EQUIPMENT AND SYSTEMS:

- A. Each Item of Equipment and Each System: Contractor shall include description of unit or system, and component parts and identify function, normal operating characteristics, and limiting conditions. Contractor shall include performance curves, with engineering data and tests, and complete nomenclature, and commercial number of replaceable parts.
- B. Panelboard Circuit Directories: Contractor shall provide electrical service characteristics, controls, and communications.

- C. Contractor shall include color coded wiring diagrams as installed.
- D. Operating Procedures: Contractor shall include start-up, break-in, and routine normal operating instructions and sequences. Contractor shall include regulation, control, stopping, shut-down, and emergency instructions. Contractor shall include summer, winter, and any special operating instructions.
- E. Maintenance Requirements: Contractor shall include routine procedures and guide for trouble-shooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.
- F. Contractor shall provide servicing and lubrication schedule, and list of lubricants required.
- G. Contractor shall include manufacturer's printed operation and maintenance instructions.
- H. Contractor shall include sequence of operation by controls manufacturer.
- I. Contractor shall provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.
- J. Contractor shall provide control diagrams by controls manufacturer as installed.
- K. Contractor shall provide Contractor's coordination drawings, with color coded piping diagrams as installed.
- L. Contractor shall provide charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams.
- M. Contractor shall provide list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.
- N. Additional Requirements: Contractor shall include all additional requirements as specified in Specification(s).
- O. Contractor shall provide a listing in Table of Contents for design data, with tabbed fly sheet and space for insertion of data.

1.07 SUBMITTAL:

- A. Contractor shall submit to the District for review two (2) copies of preliminary draft or proposed formats and outlines of the contents of the Manual within thirty (30) days of Contractor's start of Work.
- B. For equipment, or component parts of equipment put into service during construction and to be operated by District, Contractor shall submit draft content for that portion of the Manual within ten (10) days after acceptance of that equipment or component.

- C. Contractor shall submit two (2) copies of a complete Manual in final form prior to final Application for Payment. Copy will be returned with Architect/Engineer comments. Contractor must revise the content of the Manual as required by District prior to District's approval of Contractor's final Application for Payment.
- D. Contractor must submit two (2) copies of revised Manual in final form within ten (10) days after final inspection.

PART 2 – PRODUCTS Not Used.

PART 3 – EXECUTION Not Used.

END OF DOCUMENT

WARRANTIES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Warranty/Guarantee Information;
- B. Special Conditions.

1.02 FORMAT

- A. Binders: Contractor shall use commercial quality, 8-1/2 by 11 inch, three-side rings, with durable plastic covers; two inch maximum ring size.
- B. Cover: Contractor shall identify each binder with typed or printed title "WARRANTIES" and shall list title of Project.
- C. Table of Contents: Contractor shall provide title of Project; name, address, and telephone number of Contractor and equipment supplier; and name of responsible principal. Contractor shall identify each item with the number and title of the specific Specification, document, provision, or section in which the name of the product or work item is specified.
- D. Contractor shall separate each warranty with index tab sheets keyed to the Table of Contents listing, providing full information and using separate typed sheets as necessary. Contractor shall list each applicable and/or responsible Subcontractor(s), supplier(s), and/or manufacturer(s), with name, address, and telephone number of each responsible principal(s).

1.03 PREPARATION:

- A. Contractor shall obtain warranties, executed in duplicate by each applicable and/or responsible subcontractor(s), supplier(s), and manufacturer(s), within ten (10) days after completion of the applicable item or work. Except for items put into use with District's permission, Contractor shall leave date of beginning of time of warranty blank until the date of completion is determined.
- B. Contractor shall verify that documents are in proper form, contain full information, and are notarized, when required.
- C. Contractor shall co-execute submittals when required.
- D. Contractor shall retain warranties until time specified for submittal.

1.04 TIME OF SUBMITTALS:

- A. For equipment or component parts of equipment put into service during construction with District's permission, Contractor shall submit a draft warranty for that equipment or component within ten (10) days after acceptance of that equipment or component.
- B. Contractor shall submit for District approval all warranties and related documents within ten (10) days after date of completion. Contractor must revise the warranties as required by the District prior to District's approval of Contractor's final Application for Payment.
- C. For items of work delayed beyond date of completion, Contractor shall provide an updated submittal within ten (10) days after acceptance, listing the date of acceptance as start of warranty period.

PART 2 - PRODUCTS Not Used.**PART 3 – EXECUTION Not Used.**

END OF DOCUMENT

(Letterhead of Contractor)

STANDARD GUARANTEE / WARRANTY

for

Project Name

Contract No.

We hereby warrant that the Work we have provided under the above reference Contract has been completed in accordance with the Drawings, Specifications, and other Contract Documents.

Under the terms of this warranty, we agree to repair or replace any or all of our work, together with any other adjacent work which may be displaced or damaged by so doing, which may prove to be either patently defective in its workmanship or latently defective in its workmanship or materials within the period of 24 months from the date of filing of the Notice of Completion of the above named Project by the Board of Trustees of the School District, and we also agree to repair any and all damages resulting from such defects, without any expense whatsoever to said Board of Trustees, ordinary wear and tear and unusual abuse or neglect excepted.

In the event of our failure to comply with above-mentioned guarantee conditions within ten (10) day after being notified in writing by the Owner, we collectively and separately do hereby authorize the Owner to have said defective work and damages repaired or replaced and made good at our expense and will honor and pay the costs and charges therefore upon demand.

SIGNED (Contractor) _____

(Address)

(Printed Name of Authorized Representative)

Signature

(License Number)

(Date of Signing)

COUNTERSIGNED (Owner) _____

(Printed Name of Authorized Representative)

Signature

Date of Filing or Notice of Completion: _____

(Letterhead of Company)

SUBCONTRACTOR STANDARD GUARANTEE / WARRANTY

We hereby warrant that

which we have provided in _____

Name of Project _____

for

District

has been completed in accordance with Specification Section _____ and requirements of the Contract Documents.

Under the terms of this warranty, we agree to repair or replace any or all of our work, together with any other adjacent work which may be displaced or damaged by so doing, which may prove to be either patently defective in its workmanship or latently defective in its workmanship or materials within a period of 24 months from date of filing the Notice of Completion of the above-named Project by the Board of Trustees of the School District without any expense whatsoever to said Board of Trustees, ordinary wear and tear and unusual abuse or neglect excepted.

In the event of our failure to comply with above-mentioned guarantee conditions within ten (10) day after being notified in writing by the Owner, we collectively and separately do hereby authorize the Owner to have said defective work and damages repaired or replaced and made good at our expense and will honor and pay the costs and charges therefore upon demand.

SIGNED (Subcontractor)

(Signature)

(Company Name)

(Address)

(License Number)

(Date of Signing)

(License Number)

(Date of Signing)

COUNTERSIGNED (General Contractor)

(Signature)

(Company Name)

(Address)

(License Number) (Date of Signing)

(License Number) (Date of Signing)

(Letterhead of Company)

SPECIAL EXTENDED WRITTEN GUARANTEE / WARRANTY

We hereby warrant that

which we have provided in _____

Name of Project

for _____

District

has been completed in accordance with Specification Section _____ and requirements of the Contract Documents.

Under the terms of this warranty, we agree to repair or replace any or all of our work, together with any other adjacent work which may be displaced or damaged by so doing, which may prove to be either patently defective in its workmanship or latently defective in its workmanship or materials within a period of _____ year(s) from date of filing the Notice of Completion of the above-named Project by the Board of Trustees of the School District without any expense whatsoever to said Board of Trustees, ordinary wear and tear and unusual abuse or neglect excepted. We also agree to repair any and all damages resulting from such defects.

In the event of our failure to comply with above-mentioned conditions within a reasonable time but in no case longer than ten (10) calendar days after being notified in writing by the Owner, we collectively and separately do hereby authorize the Owner to have said defective work and damages repaired or replaced and made good at our expense and will honor and pay the costs and charges therefore upon demand.

SIGNED (Subcontractor)

(Name)

(Address)

(License Number)

(Date of Signing)

COUNTERSIGNED (General Contractor)

(Name)

(Address)

(License Number)

(Date of Signing)

RECORD DOCUMENTS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Documents on Work;
- B. Special Conditions.

PART 2 - RECORD DRAWINGS

2.01 GENERAL:

- A. As indicated in the Contract Documents, the District will provide Contractor with one set of reproducible, full size original Contract Drawings (mylars).
- B. Contractor shall maintain at each Project Site one set of marked-up plans and shall transfer all changes and information to those marked-up plans, as often as required in the Contract Documents, but in no case less than once each month. Contractor shall submit to the Project Inspector one set of reproducible vellums of the Project Record Drawings ("As-Built") showing all changes incorporated into the Work since the preceding monthly submittal. The As-Built shall be available at the Project Site. The Contractor shall submit reproducible vellums at the conclusion of the Project following review of the blue line prints.
- C. Label and date each Record Drawing "RECORD DOCUMENT" in legibly printed letters.
- D. All deviations in construction, including but not limited to pipe and conduit locations and deviations caused by without limitation Change Orders, Construction Claim Directives, RFI's, and Addenda, shall be accurately and legibly recorded by Contractor.
- E. Locations and changes shall be done by Contractor in a neat and legible manner and, where applicable, indicated by drawing a "cloud" around the changed or additional information.

2.02 RECORD DRAWING INFORMATION:

- A. Contractor shall record the following information:
 - (1) Locations of Work buried under or outside each building, including, without limitation, all utilities, plumbing and electrical lines, and conduits.

- (2) Actual numbering of each electrical circuit to match panel schedule.
- (3) Locations of significant Work concealed inside each building whose general locations are changed from those shown on the Contract Drawings.
- (4) Locations of all items, not necessarily concealed, which vary from the Contract Documents.
- (5) Installed location of all cathodic protection anodes.
- (6) Deviations from the sizes, locations, and other features of installations shown in the Contract Documents.
- (7) Locations of underground work, points of connection with existing utilities, changes in direction, valves, manholes, catch basins, capped stubouts, invert elevations, etc.
- (8) Sufficient information to locate Work concealed in each building with reasonable ease and accuracy.

In some instances, this information may be recorded by dimension. In other instances, it may be recorded in relation to the spaces in the building near which it was installed.

- B. Contractor shall provide additional drawings as necessary for clarification.
- C. Contractor shall provide reproducible record drawings, made from final Shop Drawings marked "No Exceptions Taken" or "Approved as Noted."
- D. After review and approval of the marked-up specifications by the Project Inspector, Contractor shall provide electronic copies of the drawings (in PDF format) with one file with all of the sheets and one set of individual sheet files at the conclusion of the Project.

PART 3 - RECORD SPECIFICATIONS

3.01 GENERAL:

- A. Contractor shall mark each section legibly to record manufacturer, trade name, catalog number, and supplier of each Product and item of equipment actually installed.
- B. After review and approval of the marked-up specifications by the Project Inspector, Contractor shall provide one electronic copy of the specifications (in PDF format) at the conclusion of the Project.

PART 4 - MAINTENANCE OF RECORD DOCUMENTS

4.01 GENERAL

- A. Contractor shall store Record Documents apart from documents used for construction as follows:

- (1) Provide files and racks for storage of Record Documents.
- (2) Maintain Record Documents in a clean, dry, legible condition and in good order.

B. Contractor shall not use Record Documents for construction purposes.

PART 5 – PRODUCTS Not Used.

END OF DOCUMENT

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes general requirements and procedures for compliance with California Code of Regulations, Title 24, Part 11 California Green Building Standards Code, "CAL-Green".

- 1. Chapter 5- Non-Residential Mandatory Measures.

1.2 RELATED REQUIREMENTS

- A. Pertinent sections specifying erosion control.
- B. Section 01 6116, Volatile Organic Compound (VOC) Restrictions.
- C. Document 01 5013, Construction Waste Management and Disposal.
- D. Document 01 7700, Contract Closeout and Final Cleaning.

1.3 DEFINITIONS

- A. CAL-Green Definitions: Certain terms are defined by CAL-Green in Chapter 5 of the code. Words and terms used in this section shall have the meanings shown therein.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Respond to questions and requests from Architect and the jurisdiction having authority regarding CAL-Green credits that are the responsibility of the Contractor, that depend on product selection or product qualities, or that depend on Contractor's procedures. Document responses as informational submittals.

1.5 SUBMITTALS

- A. CAL-GREEN Submittals: Submit CAL-GREEN submittals required by code and in other Specification Sections.
 - 1. CAL-GREEN submittals are in addition to other submittals. If submitted item is identical to that submitted to comply with other requirements, submit duplicate copies as a separate submittal to verify compliance with indicated CAL-GREEN requirements.
 - 2. Acceptable verification submittals are specified in the related sections.

SUSTAINABLE DESIGN REQUIREMENTS
SECTION 01 8113
3595001

PART 2 - PRODUCTS

2.1 REQUIREMENTS - GENERAL

- A. Provide products and procedures necessary to confirm CAL-GREEN compliance required in this Section. Although other Sections may specify some CAL-GREEN requirements, the Contractor shall determine additional materials, techniques, means, methods and procedures necessary to comply with CAL-GREEN requirements.

2.2 STORM WATER POLLUTION PREVENTION PLAN

- A. Section 5.106.1: Comply with requirements of this code section, local ordinances, General Conditions, Special Provisions, and related sections specifying erosion control.

2.3 OUTDOOR WATER USE

- A. Section 5.304.3.1: Irrigation Controllers: Comply with requirements of this code section, local ordinances and Section 32 8000.

2.4 CONSTRUCTION WASTE REDUCTION

- A. Section 5.408 Construction Waste Management, Diversion and Recycling: Comply with requirements of this code section, local ordinances and Section 01 7419.

2.5 BUILDING MAINTENANCE AND OPERATION

- A. Section 5.410.2.3, 4. Commissioning and Functional Performance Testing: Participate in Commissioning and provide functional performance testing as required by these code sections and as specified in Section 01 9113.
- B. Section 5.410.2.5. Documentation and Training: Provide Operations Training as required by these code sections and as specified in Section 01 7700 and Systems Manual as specified in Section 01 7700.

2.6 POLLUTANT CONTROL

- A. Section 5.504.3 Indoor Air Quality: Comply with requirements of this code section, local ordinances.
- B. Section 5.504.4 Finish Material Pollutant Control: All Finish materials shall comply with requirements of this code section, local ordinances and Section 01 6116.

PART 3 - EXECUTION

3.1 GENERAL

- A. Comply with Document 01 5013, Construction Waste Management and Disposal.

SUSTAINABLE DESIGN REQUIREMENTS
SECTION 01 8113
3595001

- B. Comply with execution requirements of related sections and applicable local codes and ordinances.

END OF SECTION

*p:\sacramento\3595 tracy unified school district\001-000_villalovoz es new shade structures\08 specifications\06 spec\04
final\hirsch\01 8113.10_sustainable design requirements (cal-green).docx
Last Updated: April 8, 2019*

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Sealants and backing for interior and exterior joints.

1.2 RELATED REQUIREMENTS

- A. Section 01 6116, Volatile Organic Compound (VOC) Restrictions, for VOC limits pertaining to adhesives, sealants, fillers, primers, and coatings.
- B. Section 01 8113, Sustainable Design Requirements, for CAL-Green general requirements and procedures.
- C. Pertinent Sections specifying sealants or referencing this Section for sealant products and installation requirements.
- D. Section 07 8413, Penetration Firestopping, for sealing joints in fire-resistance-rated construction.

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on Drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CAL Green), edition as noted on Drawings, as adopted by the California Division of the State Architect (DSA).
- C. American Concrete Institute (ACI) Publications and Standards:
 - 1. ACI 302.1R: Guide to Concrete Floor and Slab Construction.
 - 2. ACI 360R-10: Guide to Design of Slabs-on-Ground.
- D. ASTM International (ASTM):
 - 1. C834: Standard Specification for Latex Sealants.
 - 2. C919: Standard Practice for Use of Sealants in Acoustical Applications.
 - 3. C920: Standard Specification for Elastomeric Joint Sealants.
 - 4. C1193: Standard Guide for Use of Joint Sealants.
 - 5. C1247: Standard Test Method for Durability of Sealants Exposed to Continuous Immersion in Liquids.
 - 6. C1248: Standard Test Method for Staining of Porous Substrate by Joint Sealants.
 - 7. C1311: Standard Specification for Solvent Release Sealants.
 - 8. C1330: Standard Specification for Cylindrical Sealant Backing for Use with Cold Liquid-Applied Sealants.

JOINT SEALANTS
SECTION 07 9200
3595001

9. C1521: Standard Practice for Evaluating Adhesion of Installed Weatherproofing Sealant Joints.
 10. D1667: Standard Specification for Flexible Cellular Materials - Poly (Vinyl Chloride) Foam (Closed-Cell).
 11. E90: Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements.
- E. Federal Specifications (FS):
1. FS TT-S-001657: Sealing Compound--Single Component, Butyl Rubber Based, Solvent Release Type.
- F. South Coast Air Quality Management District (SCAQMD):
1. Rule 1168: Adhesive and Sealant Applications.
- G. U.S. Food & Drug Administration (FDA):
1. Code of Federal Regulations: Title 21, 21 CFR 177.2600, Rubber Articles Intended for Repeated Use.

1.4 DEFINITIONS

- A. Sealant Terminology in accordance with ASTM C834 and ASTM C920:
1. Type C: Clear / translucent sealant.
 2. Type OP: Opaque pigmented sealant.
 3. Type S: Single component sealant.
 4. Type M: Sealant with two or more components.
 5. Grade NS: Nonsag sealant.
 6. Grade P: Pourable sealant.
 7. Grade -18°C: Sealant with low temperature flexibility tested to -18°C (0°F).
 8. Grade 0°C: Sealant with low temperature flexibility tested to 0°C (32°F).
 9. Grade NF: Sealant does not meet low temperature flexibility requirements.
 10. Class 12-1/2: Sealant capable of handling movement, either contraction or expansion, of 12.5 percent of the original joint width.
 11. Class 25: Sealant capable of handling movement, either contraction or expansion, of 25 percent of the original joint width.
 12. Class 35: Sealant capable of handling movement, either contraction or expansion, of 35 percent of the original joint width.
 13. Class 50: Sealant capable of handling movement, either contraction or expansion, of 50 percent of the original joint width.
 14. Class 100 / 50: Sealant capable of handling movement of 50 percent contraction and 100 percent expansion.
 15. Use Related to Exposure:
 - a. Use NT: Nontraffic.
 - b. Use T: Traffic.
 - c. Use I: Immersible.

16. Use Related to Material:
 - a. Use A: Sealant used in contact with aluminum.
 - b. Use G: Sealant used in contact with glass.
 - c. Use M: Sealant used in contact with mortar.
 - d. Use O: Sealants used in contact with all other materials other than those previously listed.

1.5 ADMINISTRATIVE REQUIREMENTS

- A. Submittal Procedures:
 1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
 2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
 3. Sustainable Design Submittals shall comply with the additional requirement of Section 01 8113, Sustainable Design Requirements.
- B. Pre-Installation Meeting: Conduct at Project site. Review joint application procedures, compatibility tests, adhesion tests, and warranty requirements in a meeting involving Architect, Project Inspector, installer, manufacturer or manufacturer's representative.
- C. Coordination:
 1. Use of different manufacturer's sealant types for application at exterior wall and glazing systems is not permitted. It is required that a single source for silicone sealants be used on this Project. The Contractor is responsible for coordinating compliance with this requirement where installation of sealants is delegated to various Subcontractors installing the exterior envelope systems for the Project.
 2. Contractor shall coordinate and be responsible for compatibility and performance between sealants and other materials, and related Sections using sealants which may be in direct contact with work of this Section or adjacent to the other. Isolate and prevent of incompatibility between sealants in accordance with manufacturer's specifications, recommendations and instructions.

1.6 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated, demonstrate compliance with specified attributes.
 1. Include color chart from manufacturers for each joint sealant product required.
 2. Provide certification by joint sealant manufacturer that materials provided for this Section are 100 percent asbestos-free.
- B. Samples for initial Selection: In form of manufacturer's standard bead samples, consisting of strips of actual products showing full range of colors available, for each product exposed to view.

JOINT SEALANTS

SECTION 07 9200

3595001

- C. Samples for Verification: For each kind and color of joint sealant required, provide Samples with joint sealants in 1/2 inch wide joints formed between two 6 inch long strips of material matching the appearance of exposed surfaces adjacent to joint sealants.
- D. Joint-Sealant Schedule: Include the following information.
 - 1. Joint-sealant application, joint location, and designation.
 - 2. Joint-sealant manufacturer and product name.
 - 3. Joint-sealant formulation.
 - 4. Joint-sealant colors (multiple colors will be required).

1.7 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.
- B. Product Certificates: For each kind of joint sealant and accessory, from manufacturer.
- C. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, indicating that sealants comply with requirements.
 - 1. Preconstruction Compatibility and Adhesion Test Reports from sealant manufacturer, indicating the following:
 - a. Materials forming joint substrates and joint-sealant backings have been tested for compatibility and adhesion with joint sealants.
 - b. Interpretation of test results and written recommendations for primers and substrate preparation needed for adhesion.
 - 2. Preconstruction Field-Adhesion Test Reports: Indicate which sealants and joint preparation methods resulted in optimum adhesion to joint substrates based on testing specified in this Section.
- D. Sustainable Design:
 - 1. General:
 - a. Submit information necessary to establish and document compliance with the California Green Building Standards Code.
 - b. Sustainable design submittals are in addition to other submittals.
 - 2. The following information shall be provided:
 - a. Adhesives and Sealants: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.
- E. Sample of manufacturer's warranty.
- F. Record of Pre-Installation Meeting.

1.8 CLOSEOUT SUBMITTALS

- A. Warranty and Guarantee: Submit executed warranty and extended Contractor guarantee.

1.9 QUALITY ASSURANCE

- A. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for installation of sealants and backing required for this Project.
- B. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.
- C. Single Source Responsibility: Obtain each kind of joint sealant from single source from single manufacturer.
- D. Materials, components, assemblies, workmanship and installation are to be observed by the Project Inspector. Work not so inspected is subject to uncovering and replacement.
- E. Mockups: Install sealant in mockups of assemblies specified in other Sections that are indicated to receive joint sealants specified in this Section. Use materials and installation methods specified in this Section.

1.10 PRECONSTRUCTION TESTING

- A. Preconstruction Testing is not required if joint-sealant manufacturers submit joint preparation data that are based on previous testing, not older than 24 months, of sealant products for adhesion to, and compatibility with, joint substrates and other materials matching those submitted.
- B. Preconstruction Compatibility and Adhesion Testing: Submit to sealant manufacturers, for testing indicated below, samples of materials that will contact or affect joint sealants.
 - 1. Use manufacturer's standard test method to determine whether priming and other specific joint preparation techniques are required to obtain rapid, optimum adhesion of joint sealants to joint substrates.
 - 2. Submit not fewer than eight pieces of each kind of material, including joint substrates, shims, joint-sealant backings, secondary seals, and miscellaneous materials.
 - 3. Schedule sufficient time for testing and analyzing results to prevent delaying the Work.
 - 4. For materials failing tests, obtain joint-sealant manufacturer's written instructions for corrective measures including use of specially formulated primers.
- C. Preconstruction Field-Adhesion Testing: Before installing sealants, field test their adhesion to Project joint substrates as follows:
 - 1. Locate test joints where indicated on Project or, if not indicated, as directed by Architect.
 - 2. Conduct field tests for each kind of sealant and joint substrate indicated.
 - 3. Notify Architect seven days in advance of dates and times when test joints will be erected.
 - 4. Arrange for tests to take place with joint-sealant manufacturer's technical representative present.

JOINT SEALANTS
SECTION 07 9200
3595001

5. Test Method: Test joint sealants according to Method A, Field-Applied Sealant Joint Hand Pull Tab, in Appendix X1 in ASTM C 1193 or Method A, Tail Procedure, in ASTM C 1521.
 - a. For joints with dissimilar substrates, verify adhesion to each substrate separately; extend cut along one side, verifying adhesion to opposite side. Repeat procedure for opposite side.
6. Report whether sealant failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each kind of product and joint substrate. For sealants that fail adhesively, retest until satisfactory adhesion is obtained.
7. Evaluation of Preconstruction Field-Adhesion-Test Results: Sealants not evidencing adhesive failure from testing, in absence of other indications of noncompliance with requirements, will be considered satisfactory. Do not use sealants that fail to adhere to joint substrates during testing.

1.11 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials to project site in original factory wrappings and containers, labeled with identification of manufacturer, product name and designation, color, expiration period for use, pot life, curing time, and mixing instructions for multicomponent materials.
- B. Store and handle materials in compliance with manufacturer's recommendations to prevent their deterioration or damage due to moisture, high or low temperatures, contaminants, or other causes.

1.12 FIELD CONDITIONS

- A. Environmental Conditions: Do not proceed with installation of joint sealants under the following conditions:
 1. When ambient and substrate temperature conditions are outside the limits permitted by joint sealant manufacturer.
 2. When joint substrates are wet.
- B. Joint Width Conditions: Do not proceed with installation of joint sealants where joint widths are less than allowed by joint sealant manufacturer for application indicated.
- C. Joint Substrate Conditions: Do not proceed with installation of joint sealants until contaminants capable of interfering with their adhesion are removed from joint substrates.

1.13 WARRANTY AND GUARANTEE

- A. Manufacturer: In addition to the Contractor's and Subcontractor's Standard Guarantee, furnish Owner with manufacturer's fully executed written warranty for sealant against defects in materials and workmanship for a period of 5 years:
- B. Contractor: in addition to its standard Guarantee under the Contract, furnish Owner a special extended written five-year guarantee, cosigned by installer, for sealant, agreeing to replace any and all joints that leaks or otherwise fails to perform as required within guarantee period as a result of failure of materials or installation workmanship at no additional cost to the Owner.

PART 2 - PRODUCTS

2.1 DESIGN AND PERFORMANCE CRITERIA

- A. Sustainable Design:
 - 1. VOC emissions for field-applied adhesives, sealants, and sealant primers must comply with limits specified in Section 01 6116.
- B. Building Envelope: Make watertight and weatherproof.
 - 1. Exterior work that does not remain watertight and all work which does not retain all properties inherent in the product as stipulated by the manufacturer will be considered faulty.
- C. Provide elastomeric joint sealants that have been produced and installed to establish and to maintain watertight and airtight continuous seals without causing staining or deterioration of joint substrates.
- D. Provide joint sealants for interior applications that have been produced and installed to establish and maintain airtight continuous seals that are water resistant and cause no staining or deterioration of joint substrates.
- E. Design Requirements:
 - 1. Seal building joints with non-sag type sealant.
 - 2. Seal floor joints with self-leveling or slope grade self-leveling type sealant.

2.2 MATERIALS, GENERAL

- A. Compatibility: Provide joint sealants, joint fillers, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by sealant manufacturer based on testing and field experience.
- B. Liquid-Applied Joint Sealants: Comply with ASTM C920 and other requirements indicated for each liquid-applied joint sealant specified, including those referencing ASTM C920 classifications for type, grade, class, and uses related to exposure and joint substrates.
 - 1. Suitability for Immersion in Liquids. Where sealants are indicated for Use I for joints that will be continuously immersed in liquids, provide products that have undergone testing according to ASTM C 1247. Liquid used for testing sealants is deionized water, unless otherwise indicated.
- C. Stain-Test-Response Characteristics: Where sealants are specified to be non-staining to porous substrates, provide products that have undergone testing according to ASTM C 1248 and have not stained porous joint substrates indicated for Project.
- D. Suitability for Contact with Food: Where sealants are indicated for joints that will come in repeated contact with food, provide products that comply with 21 CFR 177.2600.

JOINT SEALANTS
SECTION 07 9200
3595001

E. Colors:

1. General:
 - a. Architect will provide color selections and locations for each sealant type and for Contractor's use.
 - b. Not all locations will have the same color.
 - c. Custom colors **[will] [may]** be required.
2. Provide color of exposed joint sealants to comply with the following:
 - a. Provide colors matching selections made by Architect from manufacturer's full range of colors for products of type indicated.
 - b. Request color selection for exposed products listed without a preselected color.

2.3 SILICONE JOINT SEALANTS

- A. Single-Component, Nonsag, Neutral-Curing Silicone Joint Sealant: ASTM C920, Type S, Grade NS, Class 100 / 50, for Use NT.
 1. Products: The following, or equal:
 - a. The Dow Chemical Company; "DOWSIL" 790.
 - b. Sika Corporation, Construction Products Division; "Sikasil" WS-290.
- B. Single-Component, Nonsag, Neutral-Curing Silicone Joint Sealant: ASTM C920, Type S, Grade NS, Class 50, for Use NT.
 1. Products: The following, or equal:
 - a. Dow Corning Corporation; "DOWSIL 795 Building Sealant".
 - b. Sika Corporation, Construction Products Division; "Sikasil WS-295."
- C. Single-Component, Nonsag, Non-Bleed, Neutral-Curing Silicone Joint Sealant: ASTM C920, Type S, Grade NS, Class 50, for Use G, M, A and O.
 1. Products: The following, or equal:
 - a. The Dow Chemical Company; "DOWSIL 756 SMS."
 - b. Momentive Performance Materials; "SCS9000 SilPruf NB."
- D. Single-Component, Nonsag, One Part RTV Neutral-Curing Silicone Joint Sealant: ASTM C920, Type S, Grade NS, Class 25, designed for adhering to low energy surfaces common in sheet or peel and stick weather resistant barriers.
 1. Products: The following, or equal:
 - a. The Dow Chemical Company; "DOWSIL" 758.
 - b. Sika Corporation, Construction Products Division; "Sikasil-N Plus."
- E. Mildew-Resistant, Single-Component, Acid-Curing Silicone Joint Sealant: ASTM C920, Type S, Grade NS, Class 25, for Use NT, A and O.
 1. Products: The following, or equal:
 - a. The Dow Chemical Company; "DOWSIL 786 Mildew Resistant."

- b. Momentive Performance Materials; GE Silicones “Sanitary SCS1700.”

2.4 URETHANE JOINT SEALANTS

- A. Single-Component, Nonsag, Urethane Joint Sealant: ASTM C920, Type S, Grade NS, Class 35, for Use NT.
 - 1. Products: The following, or equal:
 - a. BASF Master Builders Solutions; “MasterSeal NP 1.”
 - b. Sika Corporation, Construction Products Division; “Sikaflex-1a.”
- B. Multicomponent, Nonsag, Urethane Joint Sealant: ASTM C920, Type M, Grade NS, Class 25, for Use NT, M, A and O.
 - 1. Products: The following, or equal:
 - a. BASF Master Builders Solutions; “MasterSeal NP 2.”
 - b. Sika Corporation, Construction Products Division; “Sikaflex-2c NS.”
- C. Multicomponent Urethane Joint Sealant: ASTM C920; self-leveling, Type M, Grade P, Class 25, Uses T, M, A, O, and approved by manufacturer for wide joints up to 1-1/2 inches.
 - 1. Products: The following or equal:
 - a. BASF Master Builders Solutions; “MasterSeal SL 2.”
 - b. Sika Corporation, Construction Products Division; “Sikaflex 2c SL.”

2.5 BUTYL JOINT SEALANTS

- A. Butyl-Rubber-Based Joint Sealants: ASTM C1311 and FS TT-S-001657, Type I.
 - 1. Products: The following, or equal:
 - a. Bostik, Inc.; “Chem-Calk 300.”
 - b. Pecora Corporation; “BC-158.”

2.6 ACRYLIC LATEX JOINT SEALANTS

- A. Latex Joint Sealant: Acrylic latex or siliconized acrylic latex, nonsag, paintable, nonstaining. ASTM C 834, Type OP, Grade NF.
 - 1. Products: The following, or equal:
 - a. Pecora Corporation; “AC-20.”
 - b. Sherwin Williams; 950A.

2.7 ACOUSTICAL JOINT SEALANTS

- A. Acoustical Sealant; ASTM C834, nonsag, paintable, nonstaining latex sealant. Effectively reduce airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E90.

JOINT SEALANTS
SECTION 07 9200
3595001

1. Products: The following, or equal:
 - a. Pecora Corporation; "AC-20" or "AC-20 FTR" (Fire and Temperature Rated).
 - b. United States Gypsum Company: USG "Sheetrock Acoustical Sealant,"

2.8 JOINT SEALANT BACKING

- A. General: Provide sealant backings of material and type that are nonstaining; are compatible with joint substrates, sealants, primers and other joint fillers; and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.
- B. Cylindrical Sealant Backer Rods: Compressible, non-gassing rod-stock complying with ASTM C1330; polyethylene-jacketed polyurethane foam; butyl-rubber foam; neoprene foam; or other flexible, permanent, durable, non-absorptive closed-cell (Type C), open cell (Type O), or bi-cellular material (Type B) and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.
 1. Open cell rods shall not be used at sealant joints for horizontal surfaces.
 2. Closed cell rods shall not be used at double sealant joints.
- C. Bond-Breaker Tape: Polyethylene tape or other plastic tape as recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint filler materials or joint surfaces at back of joint where such adhesion would result in sealant failure. Provide self-adhesive tape where applicable.

2.9 SEALANT ACCESSORIES AND ADDITIONAL MATERIALS

- A. Primer: Material recommended by joint sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint sealant-substrate tests **[and field tests]**.
- B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming in any way joint substrates and adjacent nonporous surfaces, and formulated to promote optimum adhesion of sealants with joint substrates.
- C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.
- D. Spall Repair Mortar: Two-component structural epoxy binder and sand aggregate, producing a mortar that is easily worked and troweled. Early-set system designed specifically for the repair of industrial concrete floors subject to hard wheeled traffic. Compatible with joint filler and recommended by the joint filler manufacturer in writing.
 1. Products: The following, or equal:
 - a. Metzger/McGuire: "Armor-Hard."

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting joint sealant performance. Do not proceed with installation of joint sealants until unsatisfactory conditions have been corrected.
- B. Commencement of work indicates acceptance of substrates.

3.2 PREPARATION

- A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with recommendations of joint sealant manufacturer and the following requirements:
 - 1. Remove foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.
 - 2. Clean concrete, masonry, unglazed surfaces of ceramic tile, and similar porous joint substrate surfaces by brushing, grinding, blast cleaning, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining from above cleaning operations by vacuuming or blowing out joints with oil-free compressed air.
 - 3. Remove laitance and form release agents from concrete.
 - 4. Clean metal, glass, porcelain enamel, glazed surfaces of ceramic tile, and other nonporous surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants.
- B. Spall Repair: Repair spalled joints in concrete slabs to produce joints of profiles recommended by joint sealer manufacturers.
- C. Joint Priming:
 - 1. Prime joint substrates where indicated or where recommended by joint sealant manufacturer based on preconstruction joint sealant-substrate tests or prior experience.
 - 2. Apply primer to comply with joint sealant manufacturer's recommendations. Confine primers to areas of joint sealant bond; do not allow spillage or migration onto adjoining surfaces.
- D. Masking Tape:
 - 1. Use masking tape where required to prevent contact of sealant with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears.

JOINT SEALANTS
SECTION 07 9200
3595001

2. Remove tape immediately after tooling without disturbing joint seal.
- E. Remove sealant and prepare joints in existing exterior locations as directed by representative of sealant manufacturer specified in this work.

3.3 INSTALLATION OF JOINT SEALANTS

- A. General:
 1. Comply with joint sealant manufacturer's printed installation instructions applicable to products and applications indicated, except where more stringent requirements apply.
 2. Seal around penetrations, holes, gaps, surface mounted fixtures and pipes entering building including light fixtures, mounting brackets and other similar items.
- B. Sealant Installation Standard: Comply with recommendations of ASTM C1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.
- C. Joint Sealants at Building Exterior and Interior:
 1. Seal the following joints with joint sealant:
 - a. Expansion and control joints in exterior walls, copings, parapets.
 - b. Joints between metal panels.
 - c. Joints between door and window frames and adjacent materials.
 - d. Joints between cabinets and countertops and walls.
 - e. Control joints in interior partitions, including portion above ceilings.
 - f. Expansion and control joints in solid exterior soffits.
 - g. Control joints in interior ceilings and soffits.
 2. Apply continuous bead of joint sealant in the following locations during installation of materials specified elsewhere:
 - a. In lap joints of sheet metal construction.
 - b. Roofing panels and roof-related sheet metal and flashing.
 - c. Between partition floor and ceiling tracks and adjacent construction.
 - d. Between end stud of partition and adjacent construction.
 - e. Under door sills and thresholds.
 - 1) Set sills and thresholds in continuous double bead of sealant.
 - 2) Provide sealant at butt ends of thresholds against door frame, around door frame and between threshold and resilient floor covering.
 3. Apply acoustic sealant at acoustic separations to make assembly airtight.
 - a. Seal perimeter and intersections of finish.
 - b. Seal around electrical boxes and other penetrations of finish; seal holes within electrical boxes; seal conduit ends.
 - c. Seal pipes which penetrate acoustic separations.
 4. Apply joint sealant at joints not specifically mentioned above which require sealant to meet the performance criteria cited in this Section.

- D. Installation of Sealant Backer Rods: Install sealant backer rods to comply with the following requirements:
1. Install joint fillers of type indicated to provide support of sealants during application and at position required to produce the cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
 - a. Do not leave gaps between ends of joint fillers.
 - b. Do not stretch, twist, puncture, or tear joint fillers.
 - c. Remove absorbent joint fillers that have become wet prior to sealant application and replace with dry material.
 2. Install bond breaker tape between sealants where backer rods are not used between sealants and joint fillers or back of joints.
- E. Sealant Installation:
1. Install sealants by proven techniques that result in sealants directly contacting and fully wetting joint substrates, completely filling recesses provided for each joint configuration, and providing uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.
 2. Install sealants at the same time sealant backings are installed.
- F. Tooling of Nonsag Sealants:
1. Immediately after sealant application and prior to time skinning or curing begins, tool sealants to form smooth, uniform beads of configuration indicated, to eliminate air pockets, and to ensure contact and adhesion of sealant with sides of joint. Remove excess sealants from surfaces adjacent to joint.
 2. Do not use tooling agents that discolor sealants or adjacent surfaces or are not approved by sealant manufacturer.
 3. Profiles:
 - a. Provide concave joint configuration in accordance with Figure 8A in ASTM C1193, unless otherwise indicated.
 - b. Provide flush joint configuration in accordance with Figure 8B in ASTM C1193, where indicated.
 - c. Provide recessed joint configuration in accordance with Figure 8C in ASTM C1193, of recess depth and at locations indicated.
 - 1) Use masking tape to protect adjacent surfaces of recessed tooled joints.
- G. Joint Fillers in Refrigerated Rooms:
1. Apply joint filler only after rooms have been brought down to the final temperature for five calendar days.
 2. Provide supplemental heat and dual dispensing system as required to apply in strict accordance with the manufacturer's directions.

JOINT SEALANTS

SECTION 07 9200

3595001

3.4 DEFECTIVE WORK

- A. Repair damaged and defective work and eliminate functional and visual defects. Where repair is not possible replace work. Adjust joints for uniform appearance.
- B. Cut out and remove damaged or deteriorated joint sealants immediately so that and installations with repaired areas are indistinguishable from original work.

3.5 CLEANING AND PROTECTION

- A. Clean off excess sealants or sealant smears adjacent to joints as work progresses by methods and with cleaning materials approved by manufacturers of joint sealants and of products in which joints occur.
- B. Clean excess adhesive from exposed surfaces of neoprene compression seal with solvent cleaner as recommended by manufacturer.
- C. Protect joint sealants during and after curing period from contact with contaminating substances or from damage resulting from construction operations or other causes so that they are without deterioration or damage at time of Substantial Completion.

3.6 SEALANT SCHEDULE

- A. General:
 - 1. Joints in construction between interior and exterior spaces and other designated or required locations to provide effective barrier against passage of elements:
 - a. Multicomponent, Nonsag, Urethane Joint Sealant: ASTM C920, Type M, Grade NS, Class 25, for Use NT, M, A and O.
 - b. Single-Component, Nonsag, Urethane Joint Sealant: ASTM C920, Type S, Grade NS, Class 25, for Use NT.
 - 2. Specialty perimeters where required for appearance or weather tightness:
 - a. Multicomponent, Nonsag, Urethane Joint Sealant: ASTM C920, Type M, Grade NS, Class 25, for Use NT, M, A and O; capable of 50 percent extension and compression movement.
 - b. Single-Component, Nonsag, Urethane Joint Sealant: ASTM C920, Type S, Grade NS, Class 35, for Use NT.
 - c. Single-Component, Nonsag, Neutral-Curing Silicone Joint Sealant: ASTM C920, Type S, Grade NS, Class 50, for Use NT.
 - d. Single-Component, Nonsag, Neutral-Curing Silicone Joint Sealant: ASTM C920, Type S, Grade NS, Class 100 / 50, for Use NT.
- B. Exterior Locations:
 - 1. Joints Bordered by Glass: Single-component, nonsag, neutral-curing silicone joint sealant, ASTM C920, Type S, Grade NS, Class 50, for Use NT.
 - 2. Joints Bordered by Plastic: Single-component, nonsag, neutral-curing silicone joint sealant, ASTM C920, Type S, Grade NS, Class 100 / 50, for Use NT.

3. Horizontal Joints in Exterior Walks Abutting Building Walls, Interior Concrete Floors: Multicomponent urethane sealant, self-leveling; ASTM C920, Grade P, Class 25, Uses T, M and A.
 - a. Where walks abut structural slabs or stoops.
 - b. Where walks abut exterior wall of buildings.
 - c. Where exposed interior concrete slabs abut vertical surfaces.
 - d. Where sealant is shown on the Drawings for concrete slabs.
4. Sheet Metal and Roof Accessory Sealants: Types recommended by roofing manufacturer and complying with requirements of this Section.
5. Exterior Sheet Metal Lap Joints: Types recommended by manufacturer and complying with requirements of this Section.
6. Joints Between Concrete Panels, and Between Concrete Panels and Other Work: Single-component, nonsag, neutral-curing silicone joint sealant, ASTM C920, Type S, Grade NS, Class 100 / 50, for Use NT and formulated to reduce or eliminate dirt pickup, surface streaking, and substrate staining.
7. Exterior Metal Panel Butt Joints and Trim: Types recommended by manufacturer and complying with requirements of this Section.
8. Sills and Thresholds: Butyl-rubber-based joint sealants, ASTM C1311.
9. All Other Exterior Joints:
 - a. Single-component, nonsag, neutral-curing silicone joint sealant, ASTM C920, Type S, Grade NS, Class 100 / 50, for Use NT.
 - b. Single-component, nonsag, neutral-curing silicone joint sealant, ASTM C920, Type S, Grade NS, Class 50, for Use NT.
 - c. Around perimeters of frames where door, window and louver frames abut concrete, masonry or other building materials.
 - d. Expansion and control joints in masonry.
 - e. Masonry at dissimilar material or at dissimilar masonry.
 - f. Miscellaneous locations where sealant is shown on Drawings.

C. Interior Locations:

1. Expansion and Control Joints:
 - a. Multicomponent, Nonsag, Urethane Joint Sealant: ASTM C920, Type M, Grade NS, Class 25, for Use NT, M, A and O.
 - b. Single-Component, Nonsag, Urethane Joint Sealant: ASTM C920, Type S, Grade NS, Class 35, for Use NT.
 - c. Around perimeters of frames where door, window and louver frames abut concrete, masonry or other building materials.
 - d. Expansion and control joints in masonry walls.
 - e. Masonry at dissimilar material or at dissimilar masonry.
 - f. At miscellaneous locations where sealant is shown on Drawings.
2. Sills and Thresholds: Butyl-Rubber-based joint sealants, ASTM C1311.

JOINT SEALANTS

SECTION 07 9200

3595001

3. Interior Wet Areas, Around Plumbing Fixtures, Countertops Abutting Walls, Food Service Applications: Mildew-resistant, single-component, acid-curing silicone joint sealant, ASTM C920, Type S, Grade NS, Class 25, for Use NT, A and O.
4. Interior Static Dry Joints as Required to Dress Appearance: Acrylic latex or siliconized acrylic latex joint sealant, ASTM C 834, Type OP, Grade NF
5. Sound Control Applications: Acoustical Sealant, ASTM C 834
 - a. Where Required for Sound Control with Limited Flame Spread: Acoustical sealant, ASTM C 834, fire-rated type.

END OF SECTION

*P:\Sacramento\3595 Tracy Unified School District\001-000_Villalovoz ES New Shade Structures\08 Specifications\06 SPEC\04
FINAL\Hirsch\07 9200_Joint Sealants.docx
Last Updated: March 24, 2021*

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Painting and painter's finish on all exposed exterior and interior surfaces, except prefinished items and unless otherwise noted, as required to complete finishing of the Work. The Work includes, but is not necessarily limited to, the following specific items:
1. Paint, stain or otherwise finish all new surfaces.
 2. Back priming of concealed surfaces, except as otherwise specified.
 3. Paint, repaint or finish of existing painted surfaces altered, defaced or damaged as a result of work of this Contract.
 4. Paint site items which are not prefinished, including posts, screens, panels, bollards, supports, rails and other similar improvements.
 5. Mechanical and plumbing vents on roof.
 6. Unpainted or unfinished exposed building components, pipes and conduit, including sprinkler piping, and metal ductwork, which run exposed across finished or painted surfaces.
 7. Painting work in rooms where finishing work is performed, including painting new surfaces as specified and re-painting existing surfaces within the room, unless otherwise indicated. Re-painting existing surfaces shall be with minimum of one coat using specified coatings compatible with existing.
- B. Surface treatment, priming and coats of paint specified in this Section are in addition to shop priming and surface treatment specified under other Sections unless otherwise noted.
- C. Items Not Included in This Section:
1. Factory and shop-prefinished items as specified in various Sections.
 2. Painting specified elsewhere and included in respective Sections, including but not necessarily limited to shop priming.

1.2 WORK NOT TO BE PAINTED UNLESS OTHERWISE INDICATED

- A. Exposed exterior concrete and concrete slab surfaces, except as noted.
- B. Suspended acoustical ceilings and acoustical tile, except as noted.
- C. Pre-finished casework and other factory and shop-prefinished items as specified in various Sections.
- D. Finish hardware except prime coated items.
- E. Items typically not to be painted including, but not limited to, the following:
1. Glass.

PAINTING
SECTION 09 9100
3595001

2. Ceramic tile.
 3. Membrane roofing.
 4. Safety nosings.
 5. Resilient floor covering and base.
 6. Carpet.
 7. Pre-finished paneling.
 8. Plastic laminate.
 9. Porcelain enamel.
 10. Vinyl wallcovering, except where noted.
- F. Aluminum doors, windows, frames and railings.
- G. Metal or plastic toilet partitions.
- H. Items of chromium, copper, nickel, brass, bronze or stainless steel.
- I. Surfaces in concealed areas such as furred spaces.
- J. Tops of gravel stop flanges (including priming) where roofing material will be adhered to.
- K. Wall areas concealed by cases, counters, cabinets, chalkboards, tackboards (prime coat only required).
- L. Piping or conduit including brackets and similar items therewith running on or across unpainted or otherwise unfinished walls or ceilings.
- M. Galvanized gratings, recessed foot grilles, and thresholds.
- N. Structural steel scheduled to receive fireproofing.

1.3 RELATED REQUIREMENTS

- A. Section 01 6116, Volatile Organic Compound (VOC) Restrictions; for VOC limits pertaining to adhesives, sealants, fillers, primers, and coatings.
- B. Section 01 8113, Sustainable Design Requirements, for CAL-Green general requirements and procedures.
- C. Section 07 6200, Sheet Metal Flashing and Trim.
- D. Section 07 9200, Joint Sealants.
- E. Section 09 2900, Gypsum Board.
- F. Divisions 22, 23 and 26, Exposed piping, ductwork and conduit.

1.4 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).

- B. California Green Building Standards Code (CAL Green), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- C. ASTM International (ASTM):
 - 1. D523: Standard Test Method for Specular Gloss.
 - 2. D4263: Standard Test Method for Indicating Moisture in Concrete by the Plastic Sheet Method.
 - 3. D6386: Standard Practice for Preparation of Zinc (Hot-Dip Galvanized) Coated Iron and Steel Product and Hardware Surfaces for Painting.
 - 4. D7396: Standard Guide for Preparation of New, Continuous Zinc-Coated (Galvanized) Steel Surfaces for Painting.
- D. Master Painters Institute (MPI):
 - 1. Architectural Painting Manual Guide Specification.
- E. The Association for Materials Protection and Performance (AMPP):
 - 1. SSPC-Society for Protective Coatings/ National Association of Corrosion Engineers International (NACE):
 - a. SSPC-SP 1: Solvent Cleaning.
 - b. SSPC SP-10/NACE No. 2: Near-White Metal Blast Cleaning.
 - c. SSPC-SP 16: Brush-Off Blast Cleaning of Coated and Uncoated Galvanized Steel, Stainless Steels, and Non-Ferrous Metals.

1.5 ADMINISTRATIVE REQUIREMENTS

- A. Submittal Procedures:
 - 1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
 - 2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
 - 3. Sustainable Design Submittals shall comply with the additional requirement of Section 01 8113, Sustainable Design Requirements.

1.6 ACTION SUBMITTALS

- A. Product Data: Submit list and complete descriptive data of products proposed for use. Include manufacturer's specifications, published warranty or guarantee, and application instructions. Cross-reference to paint system and locations of application areas.
- B. Samples:
 - 1. Appropriately label and identify each sample, including location and application. Include **[Architect's number as scheduled on the Drawings,]** manufacturer's name, color number, and gloss units.
 - 2. Prepare on 8 inch x 10 inch card stock for selected colors and finishes.

PAINTING
SECTION 09 9100
3595001

3. Submit sufficiently ahead of work progress to allow for color board assembly and distribution.
4. Resubmit as requested until required sheen, color, and texture are approved.

1.7 INFORMATIONAL SUBMITTALS

- A. Statement of applicator qualifications.
- B. Sustainable Design:
 1. General:
 - a. Submit information necessary to establish and document compliance with the California Green Building Standards Code.
 - b. Sustainable design submittals are in addition to other submittals.
 2. The following information shall be provided:
 - a. Paints and Coatings: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.

1.8 CLOSEOUT SUBMITTALS

- A. Guarantee: Submit Subcontractor's guarantee.

1.9 MAINTENANCE MATERIAL SUBMITTALS

- A. At completion of the Work, deliver to Owner extra stock of paint of each color used in each coating material used.
- B. Containers shall be full, tightly sealed, and clearly marked.
- C. Provide the following quantities:
 1. Field Colors: 1 five-gallon container.
 2. Accent Colors: 1 one-gallon container.

1.10 QUALITY ASSURANCE

- A. Use only new materials and products.
- B. Single-Source Responsibility:
 1. To the maximum extent practicable, select a single manufacturer to provide all materials required by this Section, using additional manufacturers to provide systems not offered by the selected principal manufacturer.
 2. For each individual system:
 - a. Provide primer and other undercoat paint produced by same manufacturer as finish coat.
 - b. Use thinner within manufacturer's recommended limits.
- C. Source Quality Control: Material shall be best grade products of type specified and listed below as regularly manufactured by these manufacturers. Materials not bearing

manufacturer's identification as standard "best grade product" of their regular line will not be considered for use.

- D. Materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.
- E. Materials and application procedures shall comply with local, state and federal air pollution control regulations.
- F. Manufacturer's representative from coating supplier shall visit the site prior to application to review and approve the specified systems. Discrepancies or recommended changes shall be submitted to the Architect for consideration prior to finalization of submittal.
- G. Site Application Mockup:
 - 1. Prior to ordering materials and unless waived by the Architect in writing, the Contractor shall provide large scale mockup areas for all colors, both interior and exterior, directly applied to the building for final color approval by the Architect.
 - 2. Minimum Size:
 - a. Ceiling Areas: Finish a panel 10 feet square.
 - b. Wall Areas: Finish a panel 8 feet long by full height of wall.
 - c. Finish a portion of other items as directed by Architect.
 - 3. Provide up to 2 adjustments at no extra cost to the Owner.
 - 4. Paint shall not be ordered or applied until such large scale sample(s) have been reviewed and approved by the Architect in writing. These requirements as described herein may be waived by the Architect in writing only.

1.11 DELIVERY, STORAGE AND HANDLING

- A. Deliver undamaged products to job in manufacturer's sealed containers and/or original bundles with tags and labels intact.
- B. Store materials in protected, clean, dry conditions off of ground and in areas which will not interfere with the progress of the Work.
- C. Transport, store and handle in strict accordance with the manufacturer's written recommendations and as specified below.
- D. Remove paint-soiled rags and waste from premises at end of each day's work or store in metal containers with metal covers.
- E. Paint stored at site, shall be in separate structure not less than 60 feet from any other building or structure. Remove empty containers and soiled rags as they accumulate. At completion, remove structure, cleanup area, and leave in original condition.

PAINTING
SECTION 09 9100
3595001

1.12 FIELD CONDITIONS

- A. Do not apply paints and coatings under conditions which jeopardize quality or appearance of painting or finishing.
- B. Cover or otherwise protect finished work of other trades and surfaces not being painted concurrently or not to be painted.
- C. Exterior:
 - 1. Comply with manufacturer's recommendations as to environmental conditions under which coatings and coating systems can be stored and applied.
 - 2. Do not apply exterior paint when air or surface temperature is under 50 degrees F or when air or surface temperature will be below 50 degrees F for 48 hours after painting.
 - 3. Do not apply immediately following snow, rain, dew or during foggy weather.
 - 4. Do not apply when temperature is over 85 degrees F except in protected or shaded areas.
- D. Interior:
 - 1. Do not apply interior paint when air or surface temperature is below 50 degrees F unless temperature is maintained constantly.
 - 2. Do not apply when ventilation is inadequate to maintain humidity lower than dew point of coldest wall.
- E. Use moisture meter for determining proper moisture levels of surfaces for painting.
- F. Report to Architect in writing upon discovery of any prime coat painting specified in other Sections of Specifications that would prevent proper application of specified finish.
- G. Furnish, erect and remove scaffolding and planks required for work under this Section. Conform to state and local codes, rules and regulations.

1.13 EXISTING CONDITIONS

- A. Existing Surfaces:
 - 1. Paint or otherwise finish all existing surfaces as indicated or scheduled on the Drawings.
 - 2. Work includes primer, paint, repaint or finish of existing painted surfaces altered, defaced or damaged as a result of work under this Contract.
- B. Existing surfaces to be painted include:
 - 1. Exterior wall surfaces, including fascia, trim.
 - 2. Soffits and exterior ceilings including exposed roof framing.
 - 3. Doors and frames, both wood and metal.
 - 4. Window frames, trim and solid infill panels except unpainted or prefinished aluminum.

5. Exposed conduit, piping, brackets, supports, and similar metal fabrications.
6. Downspouts and gutters.
7. Parapet caps and exposed flashings.
8. Mechanical well walls, all surfaces.
9. Concrete foundation where exposed below painted wall surfaces.
10. Roll-up doors and frames.
11. Closure panels between relocatable buildings.
12. Enclosure walls, screen walls, equipment yards.
13. Other work as shown on the Drawings, specified, or as required for a complete Project.

1.14 GUARANTEE

- A. Contractor: Under conditions of its Guarantee under the Contract, paint colors shall be substantially unchanged and finishes shall maintain their original adherence without showing blisters, flaking, peeling, scaling, staining or unusual deterioration or other defects.

PART 2 - PRODUCTS

2.1 DESIGN AND PERFORMANCE CRITERIA

- A. Sustainable Design:
 1. VOC emissions for field-applied paints and coatings must comply with limits specified in Section 01 6116.

2.2 MANUFACTURERS AND COATING PRODUCTS

- A. Products are specified under "Paint Systems" in Part 3 below and are manufactured by Kelly-Moore, except as otherwise indicated. Equivalent products to those scheduled manufactured by Sherwin-Williams, PPG Architectural Finishes, Glidden Professional, Benjamin Moore & Co., Dunn-Edwards, Vista, or equal, are acceptable.
- B. Materials selected for coating systems for each type surface shall be the product of a single manufacturer or shall be acceptable to manufacturer of finish coating for system.
- C. If more than one quality level of product type is marketed, use material of highest quality.

2.3 MIXING AND TINTING

- A. Deliver paints and stains ready mixed to jobsite. On-site color mixing or tinting will not be allowed.
- B. Each kind of coating for paint finishes shall be factory-mixed to match approved samples, colors, and ready for immediate application.
- C. Mix proprietary products in strict accordance with manufacturer's printed directions.

PAINTING
SECTION 09 9100
3595001

- D. Thinning, if permitted by manufacturer for a specific coating, shall be in accordance with manufacturer's instructions. Thinning of other products shall be in accordance with standard practice.

2.4 COLORS

- A. Colors shall be as scheduled on the Drawings.
- B. Architect will prepare a color schedule with samples for guidance of painter and reserves right to select, allocate, and vary colors on different surfaces throughout building.
 - 1. Colors selected by Architect may be from manufacturer's full range standard palette or be custom mixed.
 - 2. Unless otherwise indicated on the Drawings, different colors will be selected for different materials such as walls, trim, and doors.
- C. Colors to be selected by the Architect, or where scheduled on the Drawings, are solely for the purpose of conveying color information and do not imply manufacturer's approval or waiver of the requirement that all coatings be from the same manufacturer, unless a specific system is not available from the primary manufacturer.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Prior to the work of this Section, carefully inspect and verify that the installed work of all other trades is complete to the point where this work may properly commence.
- B. Verify that painting may be performed in accordance with the approved design.
- C. In the event of discrepancy, immediately notify Architect. Do not proceed in discrepant areas until discrepancies have been fully resolved.

3.2 PREPARATION

- A. General:
 - 1. Surface preparation and product application shall be in accordance with manufacturer's printed instructions.
 - 2. In addition to prime coats indicated (primer, sealer, filler, undercoat), use two finish coats minimum, and additional coats as required for complete coverage and good appearance of scheduled finish coat.
 - 3. Surfaces to receive new finish shall be properly prepared prior to application of finish coatings.
 - 4. Do not apply paint, enamel, stains or varnishes to wet, damp, dusty, finger-marked, rough, unfinished, or defective surfaces until such defects have been corrected.
- B. Wood - Interior:

1. Thoroughly sandpaper and dust off woodwork; putty nail holes, cracks, and other defects after first coat to match color of paint. Putty where finish will be clear.
2. First coat on wood surfaces shall be sanded smooth. Other coats, except finish coat, shall be lightly sanded and dusted before and between each coat.
3. Smoothing, rubbing and sand-papering shall be sufficient to insure good results. Sand down all raised grain or rough surfaces and re-coat. Knots, pitch pockets and sappy portion of wood, all nail holes, cuts, cracks and other defects in wood shall have any necessary extra treatment to provide proper paint base.

C. Wood – Exterior:

1. Surfaces shall be dry and free of grease and splatters.
2. Rough surfaces shall be sanded smooth. **[Do not sandpaper resawn surfaces.]**
3. At opaque finish, fill nail holes, cracks, open joints, and other defects with filler after priming coat has dried. Exposed nail heads shall be spot primed.
4. Avoid painting surfaces while exposed directly to hot sun.
5. Smooth surfaces shall be sanded thoroughly to allow proper penetration and adhesion. Areas exhibiting tannic acid staining shall receive two coats of primer waiting 24 hours between coats. Sand and prime as soon as possible after installation to avoid UV degradation of unpainted wood surface.
6. Mildew, if present, shall be removed by scrubbing with a commercial mildew wash in accordance with manufacturer's directions.

D. Metals-General:

1. On metal work, only such sanding will be required as is necessary to provide for complete bonding of coats.
2. Steel and ironwork shall be scraped clean of scale, and rust and any grease shall be entirely removed.
3. Touch-up scratched and damaged places on metal priming coats.
4. Galvanized or zinc-coated metal shall be given an approved acid treatment 48 hours before paint is applied.
5. Prep and prime coat factory or shop primed metal products, including metal doors and frames, exposed framing, and other exposed metal if material was not shop primed.
6. Metal surfaces receiving epoxy coatings shall have stripe coat applied at all welds, edges, joints, etc., with epoxy primer prior to application of primer.

E. Metals–Galvanized Surfaces:

1. Surfaces shall be cleaned, and profiled where specified, prior to receiving applied coatings in accordance with ASTM D6386 or ASTM D7396 for sheet products.
 - a. Methods shall be selected based on age of galvanized coating, condition of surface and intended paint coating.
 - b. Care shall be taken not to damage the zinc coating.
 - c. Do not use phosphate treatment on galvanized surfaces scheduled to receive zinc-rich primers.

PAINTING
SECTION 09 9100
3595001

2. Comply with additional recommendations included in the AGA document "Duplex Systems: Painting Over Hot Dip Galvanized Steel."
3. Comply with any additional procedures required by the coating manufacturer.

3.3 REPAINTING EXISTING EXTERIOR SURFACES

A. General:

1. Exterior surfaces required to be re-painted, shall be power washed with surfactant, followed by rinsing to remove all loose coatings, chalk, dirt, efflorescence, oils, and other contaminants that would inhibit bond of new coating.
2. Mold or mildew shall be treated with bleach solution followed by thorough rinsing.
3. Protect openings into interior spaces during power washing including louvers, vents, vent screeds, grilles, to prevent water from entering interior areas including, attics and soffits.

B. Ferrous Metal: Steel framing, metal doors and frames, louvers, metal ductwork, and similar Items:

1. Remove all flaking, peeling and poorly bonded coatings, including rust from metal surfaces using power tool sanders or equivalent equipment. Feather edge remaining coatings.
2. Solvent scrub with MEK, all exposed bare metal, shop applied pretreatment and chalked coatings.
3. Spot prime exposed bare metal and metal pre-treatment prior to application of specified prime coat.

C. Galvanized Metal: Down spouts, wall caps, and Other Exposed Galvanized Metal.

1. Remove all loose, flaking or peeling coatings by scraping, chipping or sanding. Feather all rough edges by sanding.
2. Apply phosphoric acid etch pre-treatment to exposed galvanized metal.

D. Plaster:

1. Remove loose coatings using hand or power tools.
2. Patch plaster areas where original material has cracked, spalled or otherwise been removed with compatible material. Fill areas completely to provide smooth, even surface for refinishing. Spot prime patches prior to proceeding.
3. Patch masonry joints with cracks or missing material with compatible materials.

E. Wood Siding and Trim:

1. Remove loose, flaking or peeling coatings by scraping, chipping or sanding. Feather rough edges by sanding.
2. Surfaces that exhibit moderate to heavy chalk deposits shall be thoroughly cleaned to sound substrate by wire brushing, sanding, or power washing.
3. Spot prime bare wood, exposed nail and fastener heads prior to application of specified prime coat.

4. Glossy surfaces shall be dulled by sanding. Crystalline deposits shall be removed by flushing with water from a hose.
5. Mildew, if present, shall be removed by scrubbing with a commercial mildew wash in accordance with manufacturer's directions.

3.4 CAULKING

- A. Caulk all cracks in finished surfaces.
- B. Seal around any wall openings where original sealant is not fully sealing.
- C. Provide sealant at material transitions and intersections as required.

3.5 PROTECTION

- A. Hardware, fixture canopies, outlet covers, switch plates and other such items shall be removed or loosened and replaced after completing work as required for painting and finishing. Protect items until reinstalled.
- B. Protect work and work of others during progress against damage. Leave such work clean and whole. Correct damage by cleaning, repairing, replacing or repainting as directed.
- C. Provide necessary drop cloths for protection of work. Cover finished surfaces adjacent to work.

3.6 APPLICATION

- A. General:
 1. Do not apply initial coating until moisture content of surface is within limitations recommended by paint manufacturer.
 2. Apply coatings in accordance with manufacturer's recommendations and the additional requirements, as applicable, of the Architectural Painting Manual Guide Specifications for application methods and paint systems.
 3. Flow coat on evenly and well brushed in. Should dead spots occur, touch-up before next coat is applied. Should spots or cracks burn through after final coat is applied, apply additional coats to entire surface as necessary to remedy defects.
 4. Rate of application shall be within limits recommended by paint manufacturer for surface involved.
- B. Thicknesses: Rate of application shall be within limits recommended by paint manufacturer for surface involved and comply with the following.
 1. Paint materials shall be applied in manner to average 1.5 to 3 Dry Mills in thickness for the total number of coats scheduled.
 2. Provide Tooke Dry Mill Coating Inspection Gauge manufactured by Micro Metrics Company to the Project Inspector for inspection of finished coating systems, if requested.

PAINTING
SECTION 09 9100
3595001

- C. Refinish whole area where portion of finish is not acceptable.
- D. Adjust natural finishes as necessary to obtain identical appearance on veneers and solid stock.
- E. Equipment adjacent to walls shall be disconnected, using workers skilled in appropriate trades, and moved to permit wall surfaces to be painted. Following completion of painting, they shall be expertly replaced and reconnected.
- F. Top and bottom edges of all doors shall receive same paint system finish required for door faces.
- G. Do not paint over fire-rating labels, fusible links, or sprinkler heads.

3.7 DEFECTIVE WORK

- A. Painter shall be responsible for damage or unsuitable work, including that caused by improperly prepared surfaces. Refinishing shall be at no cost to the Owner. Repair work damaged during construction; touch-up or refinish as necessary any abraded, stained or otherwise damaged surfaces.

3.8 CLEANING AND PROTECTION

- A. Thoroughly clean any drips, splatters, spills, splashes, etc., from walls, floor or other surfaces, with no damage to those surfaces.
- B. Protect work and materials of this Section prior to and during installation, and protect the installed work and materials of other trades.
- C. In the event of damage, make all repairs and replacements necessary to the approval of the Architect at no additional cost to the Owner.

3.9 PAINT SYSTEMS

- A. General:
 - 1. Only major areas are scheduled, but miscellaneous and similar items and areas within room or space shall be treated with suitable system.
 - 2. This Specification shall serve as guide and is meant to establish procedure and quality. Confer with the Architect to determine exact finish desired.
 - 3. Number of coats scheduled is minimum. Additional coats shall be applied at no additional cost as required to hide base material completely, produce uniform color, and provide required and satisfactory finish.
- B. Gloss and Sheen Ratings: Paint gloss shall be defined as the sheen rating of applied paint, in accordance with the following limits in conformance with Master Painters Institute, Inc. (MPI) Standards according to ASTM D523. Not all of the Gloss Levels are necessarily scheduled or used on this Project.

Gloss Level	Description	Units @ 60 degrees	Units @ 85 degrees
G1	Matte or Flat finish	0 to 5	10 max.
G2	Velvet finish	0 to 10	10 to 35
G3	Eggshell finish	10 to 25	10 to 35
G4	Satin finish	20 to 35	35 min.
G5	Semi-Gloss finish	35 to 70	
G6	Gloss finish	70 to 85	
G7	High-Gloss finish	> 85	

C. Clarification of System Terminology:

1. Interior paint Systems are specified and identified herein by initial letters "INT."
2. Exterior paint Systems are specified and identified herein by initial letters "EXT."
3. The numbers following "INT" and "EXT" for each System identifies the substrate to be coated.
4. Initial numbers for each System identify the substrate to be coated summarized as follows with further clarification included with the System description:

CODE	DESCRIPTION
3.1	Concrete
3.2	Cement Plaster
4	Masonry
5	Metal
6	Wood
9.2	Gypsum Board
9.3	Acoustical Panels and Tile

5. The letter following substrate number identifies the general finish coat chemistry summarized as follows:

CODE	DESCRIPTION
A	Standard acrylic
B	Non-bridging vinyl acrylic
C	Epoxy-like acrylic
D	Semi-transparent stain
E	Elastomeric
F	High performance epoxy-like acrylic
G	Lacquer
H	Aliphatic urethane
I	Fire Retardant Intumescent
J	Acrylic Urethane
K	PVA primer
L	Acrylic primer
M	Premium performance acrylic polymer

6. Hyphenated suffix identifies the topcoat gloss level.

PAINTING
SECTION 09 9100
3595001

3.10 INTERIOR PAINTING SYSTEMS

INT 5.1A-5

Acrylic on Exposed Steel, Not Shop Primed - Gloss Level 5

1 coat	5725 DTM	Acrylic Primer
2 coats	1050 Premium Professional	Latex Semi-Gloss

Note: Modify scheduled finish coat if lower gloss level is selected by Architect.

INT 5.2A-5

Acrylic on Shop Primed Metal Including Hollow Metal Doors & Frames - Gloss Level 5

2 coats	1050 Premium Professional	Latex Semi-Gloss
---------	---------------------------	------------------

Note: Modify scheduled finish coat if higher or lower gloss level is selected by Architect.

INT 5.2M-6

Premium Performance Acrylic on Exposed Metal - Gloss Level 6

1 coat	Devacryl 1440	Waterborne Acrylic
2 coats	Devacryl 1449	100% Acrylic-Gloss

INT 9.2A-1

Acrylic on Gypsum Board - Gloss Level 1; at theater stage

1 coat	971 AcryPlex	PVA Primer/Sealer
2 coats	Speedhide 6-753 by PPG Architectural Finishes	Acrylic Latex Flat Black

INT 9.2A-3

Acrylic on Gypsum Board, textured finish - Gloss Level 3

1 coat	971 AcryPlex	PVA Primer/Sealer
2 coats	1010 Premium Professional	Latex Eggshell

INT 9.2A-5

Acrylic on Gypsum Board, smooth finish - Gloss Level 5

1 coat	971 AcryPlex	PVA Primer/Sealer
2 coats	1050 Premium Professional	Latex Semi-Gloss

Note: Provide additional topcoat at toilet rooms and food service areas.

INT 9.3B-1

Acrylic on Acoustic Panels and Tiles - Gloss Level 1

1 coat	1005 Ceiling Paint	Non-Bridging Vinyl Acrylic Flat
--------	--------------------	---------------------------------

3.11 EXTERIOR PAINTING SYSTEMS

EXT 3.2A-2

Acrylic on Cement Plaster - Gloss Level 2

1 coat	247 AcryShield	Acrylic Masonry Primer
2 coats	1210 Premium Professional	100% Acrylic Low Sheen

EXT 5.1A-5

Acrylic over Unprimed Steel - Gloss Level 5

1 coat	5725 DTM	Metal Primer
2 coats	1215 Premium Professional	100% Acrylic Semi-Gloss

EXT 5.2A-5

Acrylic over Shop Primed Metal Doors and Frames, Steel Frame, Mechanical and Electrical Equipment, and Panels - Gloss Level 5

2 coats	2888 DuraPoxy HP	Acrylic Urethane Semi-Gloss
---------	------------------	-----------------------------

EXT 5.3A-5

Premium Acrylic over Waterborne Primer on Galvanized Metal – Gloss Level 5

Pretreatment	SSPC SP-1	Heavy-duty cleaner
1 coat	5725 DTM	Acrylic Primer
2 coats	1215 Premium Professional	100% Acrylic Semi-Gloss

Note: Provide pretreatment and primer if preparation and primer not applied in shop.

EXT 5.4A-5

Acrylic over Waterborne Primer on Aluminum – Gloss Level 5

Pretreatment	Devco Devprep 88	Heavy-duty cleaner
1 coat	5725 DTM	Acrylic Primer
2 coats	1215 Premium Professional	100% Acrylic Semi-Gloss

Note: Provide pretreatment and primer if preparation and primer not applied in shop.

3.12 MISCELLANEOUS PAINTING

- A. Mechanical and Electrical Equipment, Conduits and Piping: Paint exposed items as scheduled using appropriate system for material and whether or not item has been factory-primed.
- B. Exposed Insulation-Covered Piping: Size with Arabol, or equal latex type adhesive, and apply 2 coats of semi-gloss enamel.
- C. Material Visible through Grilles, Screens, Louvers, Vents and Screens and Exposed Hardware Cloth Screening: Painted flat black to make them as unnoticeable as possible.
- D. Mechanical Equipment: Paint mechanical equipment housings where indicated on the Drawings.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Metal-framed porcelain enamel markerboards.
 - 2. Horizontal sliding markerboards.

1.2 RELATED REQUIREMENTS

- A. Section 01 6116, Volatile Organic Compound (VOC) Restrictions; for VOC limits pertaining to adhesives, sealants, fillers, primers, and coatings.
- B. Section 01 8113, Sustainable Design Requirements, for CAL-Green general requirements and procedures.
- C. Section 12 3216, Manufactured Plastic-Laminate-Clad Casework.

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CAL Green), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Submittal Procedures:
 - 1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
 - 2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Contract Closeout and Final Cleaning.
 - 3. Sustainable Design Submittals shall comply with the additional requirement of Section 01 8113, Sustainable Design Requirements.

1.5 ACTION SUBMITTALS

- A. Shop Drawings: Submit showing all parts, connections and anchorages, adjacent materials, fully dimensioned and noted. Include in-wall blocking requirements.
- B. Product Data: Manufacturer's complete descriptive data of all products proposed for use. Include manufacturer's specifications, installation instructions, and maintenance instructions.
- C. Samples: The following samples are required.
 - 1. Submit sample for each type of board and trim components to Architect for review.

MARKERBOARDS
SECTION 10 1116
3595001

2. Manufacturer's full range of colors for Architect's selection.

1.6 INFORMATIONAL SUBMITTALS

A. Sustainable Design:

1. General:
 - a. Submit information necessary to establish and document compliance with the California Green Building Standards Code.
 - b. Sustainable design submittals are in addition to other submittals.
2. The following information shall be provided:
 - a. Adhesives and Sealants: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.
 - b. Composite Wood: Evidence of compliance that products meet formaldehyde limits of current CARB Airborne Toxic Control Measure (ATCM) as specified in Section 01 6116.

B. Sample of manufacturer's warranty.

1.7 CLOSEOUT SUBMITTALS

- A. Warranty/Guarantee: Submit executed warranty and Subcontractor's guarantee.

1.8 QUALITY ASSURANCE

- A. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.
- B. Single Source Responsibility: Use materials and products of one manufacturer whenever possible.
- C. Materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.

1.9 DELIVERY, STORAGE AND HANDLING

- A. Deliver undamaged products to job in manufacturer's sealed containers and/or original bundles with tags and labels intact.
- B. Store materials in protected, dry conditions off of ground and in areas so as to not interfere with the progress of the work.
- C. Transport, store and handle in strict accord with the manufacturer's written recommendations.

1.10 WARRANTY

- A. Manufacturer: In addition to the Contractor's and Subcontractor's Guarantee, furnish Owner with the following manufacturer's fully executed written warranties against defects in materials and workmanship including against warping of sliding panel units.

1. Dry Erase Markerboards: Lifetime of the building.
2. Other Products: As available from the manufacturer.

PART 2 - PRODUCTS

2.1 DESIGN AND PERFORMANCE CRITERIA

- A. Sustainable Design:
1. VOC emissions for field-applied adhesives, sealants, and sealant primers must comply with limits specified in Section 01 6116.
 2. Composite wood products must meet current formaldehyde emission limits of CARB Airborne Toxic Control Measure (ATCM) as specified in Section 01 6116.

2.2 HORIZONTAL SLIDING MARKERBOARDS

- A. Manufacturer and Product: Top hung sliding panels and fixed back panels; "Horizontal Sliding Units" by Claridge Products and Equipment, Inc., 800-434-4610 as specified, or equal.
1. Frame: Frame and exposed metal members to be of 6063-T5 alloy, anodized satin finish, aluminum extrusions.
 2. Tray: 2-3/4 inch deep aluminum tray with end closures.
 3. Map Rail: Full length aluminum map rail with cork insert furnished with one combination hook/clip for each 24 inch of length and two flag holders.
 4. Hardware: Rolling hardware to be nylon tipped, ball bearing rollers of sufficient size and number to enable smooth and easy operation of panels.
 5. Tracks: As standard with manufacturer for number of panels at each configuration.
 6. Panel Finish: Sliding panel units and back fixed panel shall be specified markerboard.
 7. Dimensions:
 - a. Overall Size: Typical units, unless indicated otherwise, shall be 3 panels 7'-0" wide x 4'-0" high each.
 - b. Where other sizes are shown, markerboards within sliding Units shall not exceed 5'-6" in width.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Prior to installation, carefully examine and verify that the installed work of all other trades is complete to the point where this installation may properly commence.
- B. Verify that specified items may be installed in accord with the approved designs.
- C. In the event of discrepancy, immediately notify Architect. Do not proceed in discrepant areas until discrepancies have been fully resolved.

MARKERBOARDS

SECTION 10 1116

3595001

3.2 INSTALLATION – MARKERBOARDS

- A. Install items where indicated on the Drawings, in full accord with all reviewed shop drawings and the manufacturer's recommendations, anchoring components firmly in place for long life under hard use.

3.3 PROTECTION

- A. Protect work and materials of this Section prior to and during installation, and protect the installed work and materials of other trades.
- B. In the event of damage, make all repairs and replacements necessary to the approval of the Architect at no additional cost to the Owner.

END OF SECTION

*p:\sacramento\3595 tracy unified school district\001-000_villalovoz es new shade structures\08 specifications\06 spec\04
final\hirsch\10 1116_markerboards.docx
Last Updated: March 30, 2021*

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Code required signage.
 - 2. Exterior building identification and other non-code signage.

1.2 RELATED REQUIREMENTS

- A. Section 01 6116, Volatile Organic Compound (VOC) Restrictions; for VOC limits pertaining to adhesives, sealants, fillers, primers, and coatings.
- B. Section 01 8113, Sustainable Design Requirements, for CAL-Green general requirements and procedures.
- C. Division 26, Electrical.
- D. Signage requirements included on the Drawings.

1.3 REFERENCES AND STANDARDS

- A. California Building Code, edition as noted on the drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CAL Green), edition as noted on drawings, as adopted by the California Division of the State Architect (DSA).
- C. Title 19, CCR, Article 33.01(i).
- D. American National Standards Institute (ANSI):
 - 1. A-117.1: Accessible and Usable Buildings and Facilities.
- E. ASTM International (ASTM):
 - 1. A53/A53M: Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
 - 2. A153/A153M: Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Submittal Procedures:
 - 1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.

SIGNAGE
SECTION 10 1400
3595001

2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
3. Sustainable Design Submittals shall comply with the additional requirement of Section 01 8113, Sustainable Design Requirements.

B. Coordination:

1. Prior to production of shop drawings and samples, coordinate a pre-submittal conference with Architect to confirm submittal requirements, schedule, and sign review process.
2. For signs supported by or anchored to permanent construction, advise installers of anchorage devices about specific requirements for placement of anchorage devices and similar items to be used for attaching signs. Provide template for placement of sign-anchorage devices and electrical service embedded in permanent construction by other installers.

1.5 ACTION SUBMITTALS

A. Shop Drawings:

1. Scaled drawings and signage schedule for each sign indicating materials, lettering layout, and colors.
2. Large-scale drawing and details of custom logo and lettering. Include mounting details.
 - a. Include plans, elevations, and large-scale sections of typical members and other components.
 - b. Show mounting methods, grounds, mounting heights, layout, spacing, reinforcement, accessories, and installation details.
3. Font Style. 18 point graphical example of alphabet and numerical numbers 0 through 9 of signage font style, upper and lower case letters, punctuation, 18 point scale, and black text on white paper.

B. Product Data: Submit list and complete descriptive data of all products proposed for use. Include manufacturer's specifications, published warranty or guarantee, installation instructions, and maintenance instructions.

C. Samples:

1. Submit three samples of specified signage fonts to be used for visual and tactile characters including braille below the raised characters.
2. Color Verification: Provide physical sample of each available color from the manufacturer. Include color system name and serial number, code and name as applicable.
3. Control Samples. Samples shall be prepared on same base material to be used in fabrication. Submit one sample of each sign type. Signage types are indicated in Construction Document details. Interior signs shall be full size.

4. Dimensional Letters: One full-size representative samples of each dimensional letter type required, showing letter style, color, and material finish and method of attachment.
5. Symbol of Accessibility and Pictograms. Full scale sample of pictograms and symbol of accessibility to be used on sign panels and graphics.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For installer.
- B. Sustainable Design:
 1. General:
 - a. Submit information necessary to establish and document compliance with the California Green Building Standards Code.
 - b. Sustainable design submittals are in addition to other submittals.
 2. The following information shall be provided:
 - a. Adhesives and Sealants: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.
- C. Sample of manufacturer's warranty.
- D. Signage Schedule and Alphanumeric Nomenclature. As a component of shop drawings and informational submittals, verify with Architect the sign nomenclature; room names and numbers; wording of way-finding, directional and informational signage; text; and orientation of wayfinding pictorial graphics.

1.7 CLOSEOUT SUBMITTALS

- A. Warranty/Guarantee: Submit executed warranty and Subcontractor's guarantee.
- B. Maintenance data for signs and sign types including maintenance manuals.

1.8 QUALITY ASSURANCE

- A. Contractor shall assure that the vendor shall be responsible for the quality of materials and workmanship of any firm acting as the vendor's subcontractor.
- B. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.
- C. Use materials and products of one manufacturer whenever possible.
- D. Materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.
- E. The adhesion of inlaid letters and symbols will be tested. See Article WARRANTY.
- F. Mockups:

SIGNAGE
SECTION 10 1400
3595001

1. Prior to installation, provide a taping pattern for sign plaques.

1.9 DELIVERY, STORAGE AND HANDLING

- A. Deliver undamaged products to job in manufacturer's sealed containers and/or original bundles with tags and labels intact.
- B. Store materials in protected, dry conditions off of ground and in areas so as to not interfere with the progress of the work.
- C. Transport, store and handle in strict accord with the manufacturer's written recommendations.

1.10 FIELD MEASUREMENTS

- A. Make and be responsible for all field dimensions necessary for proper fitting and completion of work. Report discrepancies to Architect before proceeding.

1.11 WARRANTY

- A. Manufacturer: In addition to the Contractor's and Subcontractor's Guarantee, furnish Owner with manufacturer's available fully executed written warranty for signage against all defects in materials and workmanship, including without limitation against yellowing, cracking, crazing, and other visible and performance defects for a period of 5 years.
 1. Text, pictograms or symbols that can be removed from the sign face utilizing a sharp object or other conventional methods will be considered a manufacturing defect.

PART 2 - PRODUCTS

2.1 DESIGN AND PERFORMANCE CRITERIA

- A. Regulatory Standards:
 1. Except as otherwise specified or shown, signage shall conform to the following:
 - a. ANSI A-117.1 and the Americans with Disabilities Act (ADA).
 - b. ATBCB Design Guidelines for Signage in relation to the Americans with Disabilities Act.
 - c. California Code of Regulations, Titles 19 and 24.
 - 1) Contracted Grade 2 Braille shall be used whenever Braille symbols are specifically required. Refer to CBC Section 11B-703.3.
 - 2) All signage shall conform to 2019 CBC Section 11B-703.
 - d. Uniform Sign Code.
 2. When there is a conflict between the CBC and ADA, comply with the most stringent.
- B. Design Criteria: Refer to Chapter 11B of the California Building Code.

1. Raised Characters: Section 11B-703.2.
 - a. Depth: Section 11B-703.2.1.
 - b. Case: Section 11B-703.2.2.
 - c. Style: Section 11B-703.2.3.
 - d. Character Proportions: Section 11B703.2.4.
 - e. Character Height: Section 11B-703.2.5.
 - f. Stroke Thickness: Section 11B-703.2.6.
 - g. Character Spacing: Section 11B-703.2.7.
 - h. Line Spacing: Section 11B-703.2.8.
 - i. Installation Height and Location: Section 11B-703.4.
 2. Braille: Section 11B-703.3.
 - a. Contracted (Grade 2) Braille with rounded or domed dots shall be used wherever Braille is required.
 - 1) Braille dimensions in accordance with Table 11B-703.3.1.
 3. Visual Characters: Section 11B-703.5.
 - a. Character Proportions: Section 11B-703.5.4.
 - b. Stroke Thickness: Section 11B-703.5.7.
 - c. Character Spacing: Section 11B-703.5.8.
 - d. Line Spacing: Section 11B-703.5.9.
 4. Pictograms: Section 11B-703.6.
 - a. Pictogram Field: 11B-703.6.1.
 - 1) Characters and Braille shall not be located in the pictogram field.
 - b. Finish and Contrast: Section 11B-703.6.2.
 - 1) Pictograms and their field shall have a non-glare finish. Pictograms shall contrast with their field with either a light pictogram on a dark field or a dark pictogram on a light field.
 - c. Text Descriptors: Section 11B-703.6.3.
 - 1) Locate text descriptors directly below the pictogram field.
 - 2) Text shall be raised characters with braille directly below.
 5. International Symbol of Accessibility: Section 11B-703.7.2.1.
 6. Toilet Room Door Symbols: Section 11B-703.7.2.6.
 7. Tactile Exit Signs: Tactile exit signage to comply with 1013.4 and 11B-703.4.
- C. Sustainable Design:
1. VOC emissions for field-applied adhesives, sealants, and sealant primers must comply with limits specified in Section 01 6116.

2.2 PLASTIC SIGNS - TACTILE

- A. Materials, Unless Otherwise Noted:

SIGNAGE
SECTION 10 1400
3595001

1. Manufacturer and Product: "Inlaid Tactile Sign" by Accent Signage Systems, Inc. Minneapolis, MN, 800-215-9437 as specified and the basis of design; Ellis & Ellis Sign Systems, Sacramento, CA, 916-924-1936; ASI-Modulex, Los Altos, CA, 650-940-1354; Weidner Architectural Signage, Sacramento, CA; or equal.
 - a. Sign Face: Two 1/8-inch plies with eased edges; New Hermes "Gravo-Tac," or equal.
 - 1) Total Thickness: 1/4 inch.
 - 2) Painted signs will not be accepted.
 - b. Tactile Text: Provide tactile text and "Raster" Braille at plastic tactile signage.
 - 1) Tactile text shall be inlaid into sign face 1/32-inch and raised 1/32- inch minimum above sign face surface.
 - 2) Inlaid text shall be 1-ply, 1/16-inch thick material; "Gravo-Tac" Exterior or equal.
 - 3) Provide text and graphics precisely formed, uniformly opaque to comply with relevant ADA regulations and requirements indicated for size, style, spacing, content, position and colors.
 - 4) Symbols where specified shall be International Style.
 - 5) Braille shall be Contracted (Grade 2) Braille.
 - a) Dots shall be 0.10-inch on centers in each cell, 0.30-inch on center between corresponding dots in adjacent cells, and 0.395-inch minimum to 0.400-inch maximum on center between corresponding dots in cell directly below.
 - b) Dots shall be raised a minimum of 0.025-inch and a maximum of 0.037-inch above the background, and a base diameter of 0.059-inch minimum and 0.063- inch maximum.
 - c) Dots with straight sides and flat tops are not acceptable.
 - c. Colors: High contrast, non-glare, integral colors for graphics.
 - 1) Integral materials shall be U.V. stabilized.
 - 2) Characters, symbols and pictograms shall be in high contrast (light color) with background (dark) color and must conform to the CBC and the ADA Standards.

B. Fabrication:

1. Panel Appearance: Manufacturer's standard, high contrast, semi-matte colors.
2. Surface Texture: Matte Non-glare.
3. Character Style, Size and Layout Position:
 - a. Characters shall be 1-inch high, unless otherwise indicated.
 - b. The stroke of the uppercase letter "I" shall be 15 percent maximum of the height of the character.
 - c. The width of the uppercase letter "O" shall be 60 percent minimum and 110 percent maximum of the height of the uppercase letter "I".

SIGNAGE
SECTION 10 1400
3595001

- d. Character style to be Sans Serif, uppercase, accompanied by Braille directly below text at all locations where raised characters are required.
 - e. Spacing between baselines of separate lines of raised characters with a message shall be 135 percent minimum and 170 percent maximum of the raised character height.
 - 4. Text Schedule: Confirm text, symbols and numbering with the Architect and Owner.
 - 5. Sign Size: As indicated on the Drawings or, if not shown, as reasonably required to accommodate text, symbols and Braille.
 - a. Where signs are installed on window glazing, fabricate a blank sign back to match in size and shape to sign.
 - b. Sign backs shall cover back side of sign from view through window on opposite side of sign.
 - c. Signs that are mounted back-to-back on glazing are to be matching in size; the smaller sign is to be increased in size as reasonably required to match the larger sign.
 - 6. Sign Shape: As indicated on the Drawings.
 - a. Corners: Radiused, unless otherwise shown.
 - 7. Inlaid Letter Adhesion Process: Inlaid material shall be adhered into 1/32-inch deep routed sign face utilizing the heat and pressure bonded/chemically welded process as developed by Accent Signage Systems for the specified "Inlaid Tactile Sign."
 - a. Sign manufacturers for the specified "Inlaid Tactile Sign" shall be familiar with and utilize the exact same manufacturing process developed by Accent Signage Systems.
 - b. Manufacturer must utilize the same and required equipment, products and techniques necessary to produce authentic "Inlaid Tactile Signs" as developed by Accent Signage Systems.
 - c. Other adhesive products and methods, including applied adhesive tapes will not be accepted.
- C. Sign Types: Provide braille translation directly below the raised characters.
- 1. Room Identification Sign: Provide as shown on the Drawings.
 - a. Provide name and room number at each door indicated.
 - b. Names and numbers to be reviewed and approved by Architect and Owner prior to fabrication.
 - c. Allow an average of 4-numbers and 14-letters for each sign.
 - d. Sign to be provided adjacent to doors as shown.
 - 2. Toilet Room Identification Sign: In addition to the specified Door Symbol, provide a Toilet Room Identification Sign at the strike side of every toilet room door.
 - a. Sign shall include an International Symbol of Accessibility, pictogram, and raised characters, specifying the room name with Braille translation below pictogram.
 - 3. Tactile Exit Sign:

SIGNAGE
SECTION 10 1400
3595001

- a. Provide with text in raised characters to read: "EXIT".

2.3 PLASTIC SIGNS - NON-TACTILE

A. Materials, Unless Otherwise Noted:

Manufacturer and Product: Acrylic panel sign as manufactured and distributed by Ellis & Ellis Sign Systems, 916-924-1936, as specified and the basis of design, or equal.

1. Sign Face: 1/4-inch, matt finish, non-glare acrylic with subsurface vinyl and paint. Painted faces will not be accepted.
2. Colors: Colors shall match specified Tactile Signs and as selected by Architect and Owner.
 - a. Integral materials shall be U.V. stabilized.
 - b. Graphics and text shall be in high contrast (dark color) with background (light) color.

B. Fabrication:

1. Sign Thickness: 1/4-inch.
2. Character Style, Size and Layout Position:
 - a. Characters shall be a minimum of 1-inch high, unless otherwise indicated.
 - b. The stroke thickness of the uppercase letter "I" shall be 10 percent minimum and 20 percent maximum of the height of the character.
 - c. The width of the uppercase letter "O" shall be 60 percent minimum and 110 percent maximum of the height of the uppercase letter "I".
 - d. Letter style to be Sans Serif, uppercase.
 - e. Space characters 10 percent minimum and 35 percent maximum of height of characters, measured between two closest points of adjacent characters, excluding word spaces.
 - f. Spacing between baselines of separate lines of characters within a message shall be 135 percent minimum and 170 percent maximum of character height.
3. Text Schedule: Confirm text, symbols and numbering Architect and Owner using the shop drawing/submittal process.
4. Sign Size: As indicated on the Drawings or, if not shown, as reasonably required to accommodate text and symbols.
 - a. Where signs are installed on window glazing, fabricate a blank sign back to match in size and shape to sign.
 - b. Sign backs will cover back side of sign from view through window on opposite side of sign.
5. Sign Shape: As indicated on the Drawings or, as reasonably required to accommodate the specified text and size at lettering.
 - a. Corners: 1/4-inch radius, unless otherwise shown.

C. Sign Types:

1. Toilet Room Door Symbol: Provide one of the following symbols as appropriate to the toilet room type. Toilet Room Door Symbols shall have a color contrast that is distinctly different from the color of the door. Characters, as shown, to be flush with face of symbol. The entire background color must contrast with door. A thin contrasting border around the symbol, with remainder of sign background in a non-contrasting color is not allowed.
 - a. Girls: 12-inch diameter circle, with eased edges.
 - b. Boys: Equilateral triangle with sides 12-inches long, with eased edges.
 - c. Women: 12-inch diameter circle, with eased edges.
 - d. Men: Equilateral triangle with sides 12-inches long, with eased edges.
 - e. Unisex or Staff: equilateral triangle of contrasting color and super imposed on and geometrically inscribed within the face of 12-inch diameter circle, which is a contrasting color to the door. The vertices of the triangle symbol shall be located $\frac{1}{4}$ -inch maximum from the edge of the circle with the vertex pointing upward. Both the circle and triangle to have eased edges.
2. Occupancy Signs (Capacity Sign): Quantity of occupants shall be as indicated on the Drawings or as provided by Architect. Text to read as follows:
 - a. Maximum Number - General: "The number of people permitted in this room shall not exceed _____ by order of the Division of the State Architect."
 - b. Rooms Used for Assembly and Dining: "The number of people permitted in this room shall not exceed _____ for Assembly and _____ for Dining by order of the Division of the State Architect."
3. Assistive Listening System Sign: Provide as indicated on the Drawings.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Prior to installation, carefully inspect and verify that the installed work of other trades is complete to the point where this installation may properly commence.
- B. Verify that specified items may be installed in accordance with the approved design.
- C. In the event of discrepancy, immediately notify Architect. Do not proceed in discrepant areas until discrepancies have been fully resolved.

3.2 INSTALLATION OF SIGNS

- A. General: Locations of signs must be in accordance with the Drawings and approved shop drawings.
- B. Plastic Signs:
 1. General:
 - a. Provide both mechanical fasteners and either adhesive or 2-sided adhesive tape as recommended by manufacturer for given mounting substrate.

SIGNAGE
SECTION 10 1400
3595001

- b. Fasteners: Minimum 4-recessed flush head tamper-proof (vandal-resistant) screws per sign.
- 2. Wood and Metal Framed Walls: Mechanical fasteners shall be of adequate length to penetrate exterior finishes and provide secure embedment into wall structure or sheathing.
- 3. Concrete Walls:
 - a. Use vinyl tape and mounting holes for countersunk, vandal-proof expansion anchors (use both).
- 4. Glass:
 - a. Utilize mounting adhesive and silicone where signs are mounted to glass.
 - b. Provide vinyl window sign backer to match sign face size, mounted on opposite side of glass.
 - c. Signs mounted back-to-back are to be matching in size.
 - d. Do not pre-drill signs for mechanical fastening where sign is to be mounted to glass.
- C. Other Signs: Use mounting method that is permanent, vandal resistant, and has been approved by the Architect.

3.3 PROTECTION

- A. Protect work and materials of this Section and other Sections prior to and during installation, and protect the installed work and materials of all other trades.
- B. In the event of damage, immediately make all repairs and replacements necessary to the approval of the Architect and at no additional cost to the Owner.

3.4 ADJUSTING AND CLEANING

- A. Remove all dust, dirt, finger marks, etc. from signs and letters using cleaning methods as recommended by manufacturer.

END OF SECTION

p:\sacramento\3595 tracy unified school district\001-000_villalovoz es new shade structures\08 specifications\06 spec\04 final\hirsch\10 1400_ signage.docx
Last Updated: March 30, 2021

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Toilet accessories.

1.2 RELATED REQUIREMENTS

- A. Division 26, Electrical.

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CAL Green), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Submittal Procedures:
 - 1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
 - 2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
- B. Coordination: Coordinate with other trades as required to ensure proper and adequate provision in framing and wall finish for the installation of the selected toilet accessories in the locations required including recessed items)

1.5 ACTION SUBMITTALS

- A. Shop Drawings: Submit showing parts, connections and anchorages, adjacent materials, fully dimensioned and noted.
- B. Product Data: Submit list of each required accessory and complete descriptive data of products proposed for use. Include manufacturer's specifications, published warranty, installation instructions, and maintenance instructions.

1.6 INFORMATIONAL SUBMITTALS

- A. Sample of manufacturer's warranty.

1.7 CLOSEOUT SUBMITTALS

- A. Warranty/Guarantee: Submit executed warranty and Subcontractor's guarantee.

TOILET ACCESSORIES
SECTION 10 2813
3595001

- B. Keys for lockable accessories.
- C. Maintenance data and operating instructions.

1.8 QUALITY ASSURANCE

- A. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.
- B. Use materials and products of one manufacturer whenever possible.
- C. All materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.

1.9 DELIVERY, STORAGE AND HANDLING

- A. Deliver undamaged products to job in manufacturer's sealed containers and/or original bundles with tags and labels intact.
- B. Store materials in protected, dry conditions off of ground and in areas so as to not interfere with the progress of the Work.
- C. Transport, store and handle in strict accord with the manufacturer's written recommendations.

1.10 FIELD CONDITIONS

- A. Make and be responsible for field dimensions necessary for proper fitting and completion of Work. Report discrepancies to Architect before proceeding.
- B. Verify wall depths are adequate for each item prior to ordering. Notify Architect of conflicts or discrepancies.

1.11 WARRANTY

- A. Manufacturer: In addition to the Contractor's and Subcontractor's Guarantee, furnish Owner with manufacturer's fully executed written warranty for toilet accessories against defects in materials and workmanship, agreeing to replace and install toilet accessories at no additional cost to the Owner, within warranty period as follows:
 - 1. For a period of 3 years.

PART 2 - PRODUCTS

2.1 OWNER FURNISHED CONTRACTOR INSTALLED PRODUCTS

- A. The following products will be furnished by the Owner for installation by Contractor. Provide adequate blocking for attachment. Miscellaneous items are to be provided and installed by Contractor.

1. Toilet Tissue Dispensers.

2.2 DESIGN AND PERFORMANCE CRITERIA

- A. Conform to applicable requirements of ADA and CBC for accessibility. When in conflict, conform to the most stringent.

2.3 MANUFACTURERS

- A. Accessories: Bobrick Washroom Equipment Inc. or Bradley Corporation as specified and the basis of design, unless otherwise noted, or equal.
 1. Manufactured accessories not specified shall require approval as a substitution to be considered equal. Refer to substitution requirements specified in Section 01 3300, Submittal Procedures.
 2. Although multiple manufacturers may be specified for a specific accessory, all accessories shall be the product of a single manufacturer, unless otherwise specified or approved.

2.4 MANUFACTURED UNITS

- A. Grab Bars: 18 gauge 1-1/2 inch outside diameter, type 304 stainless steel welded to 1/8 inch type 304 solid stainless steel wall plates; Bobrick Series B-6806, Bradley 812 Series, or equal.
 1. Configurations and Lengths: As shown.
 2. Grab bar shall withstand a 250 pound point load.
 3. Joints ground and polished.
 4. Finish on Exposed Surfaces: Satin.
 5. Fastening: Concealed, vandal resistant.

2.5 FASTENINGS

- A. Toilet accessories shall be complete with required fastenings.
- B. Fastenings shall either harmonize with the item being fastened, or be of the concealed type.
- C. Exposed fastenings shall be theft and vandal-resistant.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Prior to installation of the Work of this Section, carefully inspect and verify that the installed Work of other trades is complete to the point where this installation may properly commence.
- B. Verify that specified items may be installed in accordance with the approved design.

TOILET ACCESSORIES
SECTION 10 2813
3595001

- C. In the event of discrepancy, immediately notify the Architect. Do not proceed in discrepant areas until discrepancies have been fully resolved.

3.2 PREPARATION

- A. The Contractor shall provide recesses, anchorage and back-up blocking in sizes and in locations as required for proper installation of accessories. Coordinate with other trades where necessary to make provisions for installation.
- B. Securely anchor items in place in locations and at mounting heights indicated. Where specific dimensions are not noted, installation shall be approved by the Architect.
- C. Securely fasten grab bar mounting plates to solid framing or blocking, in accordance with CBC.
- D. Provide cut-outs in toilet partitions for napkin disposal units as required.

3.3 INSTALLATION

- A. Install fixtures, accessories and items in accordance with manufacturers' printed instructions and requirements in the 2019 CBC 11B-603.5 where shown or as approved by Architect.
- B. Mount surface-mounted accessories to solid backing or blocking.
- C. Install plumb and level, securely and rigidly anchored to substrate.
- D. Use concealed vandal-resistant fastenings wherever possible.
 - 1. Adhesive installation not permitted.
 - 2. Provide anchors, bolts and other necessary fasteners, and attach accessories securely to walls or toilet partitions as recommended by manufacturer for each item and each type of substrate condition.
- E. Grab bars: Solidly anchor grab bars to withstand minimum downward pull of 500 pounds between any 2 supports after installation.
- F. Verify type, location and attachment methods of items furnished by Owner to ensure proper preparation of substrate for solid attachment of accessories.
- G. Sealants: Comply with requirements of Section 07 9200, Joint Sealants.
 - 1. Apply behind toilet accessories as necessary to ensure sanitary and watertight integrity of surfaces.
 - 2. Conceal sealants.

3.4 CLEANING AND ADJUSTING

- A. Upon completion of installation, remove manufacturer's temporary labels, marks of identification.
- B. Thoroughly wash surfaces, remove foreign materials, polish surfaces.

TOILET ACCESSORIES
SECTION 10 2813
3595001

- C. Leave entire accessories in neat, orderly, clean, acceptable condition as approved.
- D. Replace damaged parts, surfaces which are not free from imperfections.

3.5 PROTECTION

- A. Protect Work and materials of this Section prior to and during installation, and protect the installed Work and materials of other trades.
- B. In the event of damage, make repairs and replacements necessary to the approval of the Architect at no additional cost to the Owner.
- C. Exposed finish shall be free from scratches, dents, permanent discolorations and other defects in workmanship or material.

END OF SECTION

*p:\sacramento\3595 tracy unified school district\001-000_villalovoz es new shade structures\08 specifications\06 spec\04
final\hirsch\10 2813_toilet accessories.docx
Last Updated: April 1, 2021*

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Fire extinguishers, hangers and cabinets.
 - 2. Fire hose and extinguisher cabinet.

1.2 RELATED REQUIREMENTS

- A. Section 09 9100, Painting.

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CAL Green), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Submittal Procedures:
 - 1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
 - 2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.

1.5 ACTION SUBMITTALS

- A. Shop Drawings: Submit showing all parts, connections and anchorages, adjacent materials, fully dimensioned and noted. Include in-wall blocking requirements.
- B. Product Data: Submit list and complete descriptive data of all products proposed for use. Include manufacturer's specifications and installation instructions.

1.6 INFORMATIONAL SUBMITTALS

- A. Statement that all extinguishers and cabinets comply with the current applicable UL and NFPA classifications and ratings.
- B. Sample of manufacturer's warranty.

1.7 CLOSEOUT SUBMITTALS

- A. Written instructions to Owner's personnel in the operation, maintenance and charging of the fire extinguishers furnished.

FIRE EXTINGUISHERS AND CABINETS
SECTION 10 4416
3595001

- B. Warranty/Guarantee: Submit executed warranty and subcontractor's guarantee.

1.8 QUALITY ASSURANCE

- A. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.
- B. Single-Source Responsibility: Use materials and products of one manufacturer.
- C. Materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.
- D. Equipment shall be approved by Underwriters' Laboratories, Inc., bear UL Label and be approved by the State Fire Marshal.

1.9 DELIVERY, STORAGE AND HANDLING

- A. Deliver undamaged products to job in manufacturer's sealed containers and/or original bundles with tags and labels intact.
- B. Store materials in protected, dry conditions off of ground and in areas so as to not interfere with the progress of the work.
- C. Transport, store and handle in strict accord with the manufacturer's written recommendations.

1.10 FIELD MEASUREMENTS

- A. Make and be responsible for all field dimensions necessary for proper fitting and completion of work. Report discrepancies to Architect before proceeding.

1.11 WARRANTY

- A. Manufacturer: In addition to the Contractor's and Subcontractor's Standard Guarantee, furnish Owner with manufacturer's fully executed written warranty for fire extinguishers against defects in materials and workmanship for a period of not less than 5 years.

PART 2 - PRODUCTS

2.1 DESIGN AND PERFORMANCE CRITERIA

- A. Conform to all applicable standards of the National Fire Protection Association (NFPA) and California State Fire Marshal (CSFM) for fire extinguisher cabinets and locations.

2.2 FIRE EXTINGUISHERS

- A. Manufacturer: By same manufacturer as fire extinguisher cabinets.
- B. Types:

FIRE EXTINGUISHERS AND CABINETS
SECTION 10 4416
3595001

1. Fire extinguishers - General Use: UL Rating 3A-40BC extinguishers shall be 5-pound nominal capacity multi-purpose dry chemical type, bearing U.L. Label; finish shall be red enameled steel.
- C. Tamperseals on each extinguisher shall be of the breakable metal type, indicating accidental or unauthorized partial discharge.
- D. Pressure gauges on each extinguisher shall be of the dial type.
- E. Mounting Brackets:
 1. Manufacturer: Provide brackets from same manufacturer as fire extinguisher.
 2. Brackets shall be of quick release design, not subject to release by bumping.
 3. Bracket attachments shall be furnished with each bracket, suitable for the surface to which attachment is to be made.

2.3 FIRE EXTINGUISHER CABINETS

- A. General:
 1. Size cabinets to conform to size and number of extinguishers at each location shown on the Drawings.
- B. Manufacturer and Product: "Cosmopolitan" Series by JL Industries, Inc., a division of the Activar Construction Products Group as specified, or equal.
 1. Mounting:
 - a. Type 1: Semi-recessed with 2-1/2 inch return trim, rolled edge, for 3A-40BC fire extinguisher.
 - b. Type 3: Fully-recessed with 3/8 inch flat trim, depth as required.
 2. Door Style: S21 solid with black ABS flush (recessed) pull and continuous hinge.
 3. Latching Device: Manufacturer's standard roller catch.
 4. Finishes:
 - a. Door and Trim: Stainless steel, #4 satin finish.
 - b. Cabinet Box (Tub): Manufacturer's standard white electrostatic powder coat.
 5. Provide mounting clips, suitable for extinguishers being provided, in each cabinet.
 6. Identification: "FIRE EXTINGUISHER" in vertical red color lettering.
 7. Cabinet shall be fabricated to meet ADA and CBC projection criteria.
 8. Welded anchors to be provided appropriate to construction in which cabinet is placed.
 9. Cabinets located in fire rated walls to be "Cosmopolitan Fire FX" Option.

FIRE EXTINGUISHERS AND CABINETS
SECTION 10 4416
3595001

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Prior to installation of work of this Section, carefully inspect and verify that the installed work of all other trades is complete to the point where this installation may properly commence.
- B. Verify that specified items may be installed in accordance with the approved design.
- C. In the event of discrepancy, immediately notify Architect. Do not proceed in discrepant areas until discrepancies have been fully resolved.

3.2 PROTECTION

- A. Protect work and materials of this Section and other Sections prior to and during installation, and protect the installed work and materials of other trades.
- B. In the event of damage, immediately make all repairs and replacements necessary to the approval of the Architect and at no additional cost to the Owner.

3.3 INSTALLATION

- A. Install cabinets and extinguishers where indicated on the Drawings and as required by the local Fire Authority. Where exact location of cabinets is not indicated, locate as directed by Architect.
- B. Install cabinets in accordance with manufacturer's instructions and approved shop drawings.
- C. Install so that handle of extinguisher meets accessibility requirements.
- D. Prepare recesses in walls for cabinets as required by type and size of cabinet and style of trim and to comply with manufacturer's instructions. Provide blocking, backing and other materials necessary for proper attachment and fire rating.
- E. Anchor cabinets and brackets securely in place.
- F. Provide fire extinguisher in each fire extinguisher cabinet.

3.4 INSTALLATION OF FIRE EXTINGUISHERS

- A. Determine approximate completion date of work and then inspect, charge, and tag fire extinguishers not more than 10 calendar days before nor less than one day before actual completion of work.
- B. The installation of the specified fire extinguishers in no way relieves the Contractor from providing adequate fire protection during the course of this work.

FIRE EXTINGUISHERS AND CABINETS
SECTION 10 4416
3595001

END OF SECTION

*p:\sacramento\3595 tracy unified school district\001-000_villalovo es new shade structures\08 specifications\06 spec\04
final\hirsch\10 4416_fire extinguishers and cabinets.docx
Last Updated: September 24, 2021*

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Manual-operated horizontal louver blinds.

1.2 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CAL Green), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- C. National Fire Protection Association (NFPA):
 - 1. 701: Standard Methods of Fire Tests for Flame Propagation of Textiles and Films.
- D. California Administrative Code:
 - 1. Title 19: Public Safety.

1.3 ADMINISTRATIVE REQUIREMENTS

- A. Submittal Procedures:
 - 1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
 - 2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Contract Closeout and Final Cleaning.

1.4 ACTION SUBMITTALS

- A. Shop Drawings: Submit showing parts, connections and anchorages, adjacent materials, fully dimensioned and noted.
- B. Product Data: Submit list and complete descriptive data of products proposed for use. Include Manufacturer's specifications, published warranty or guarantee, installation instructions, and maintenance instructions.
- C. Samples: The following samples are required.
 - 1. Manufacturer's full range of colors for Architect's selection.

1.5 INFORMATIONAL SUBMITTALS

- A. Sample of manufacturer's warranty.

HORIZONTAL LOUVER BLINDS
SECTION 12 2113
3595001

1.6 CLOSEOUT SUBMITTALS

- A. Warranty/Guarantee: Submit executed warranty and Subcontractor's guarantee.

1.7 QUALITY ASSURANCE

- A. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.
- B. Use materials and products of one Manufacturer whenever possible.
- C. Materials, components, assemblies, workmanship and installation are to be observed by the Owner's Inspector of Record. Work not so inspected is subject to uncovering and replacement.
- D. Flame-resistant materials shall pass or exceed one of more of the following:
 - 1. National Fire Protection Association (NFPA) 701.
 - 2. California Administrative Code Title 19.

1.8 DELIVERY, STORAGE AND HANDLING

- A. Deliver undamaged products to job in Manufacturer's sealed containers and/or original bundles with tags and labels intact.
- B. Store materials in protected, dry conditions off of ground and in areas so as to not interfere with the progress of the Work.
- C. Transport, store and handle in strict accord with the manufacturer's written recommendations.

1.9 FIELD CONDITIONS

- A. Verify field measurements for openings to receive vertical blinds allowing proper clearances as recommended by Manufacturer to allow free rotation and traversing.
- B. Prior to shade installation, building shall be enclosed.
- C. Interior temperature shall be maintained between 60 degrees F and 90 degrees F during and after installation; relative humidity shall not exceed 80 percent. Wet work shall be complete and dry.

1.10 WARRANTY

- A. Manufacturer: In addition to the Contractor's and Subcontractor's Guarantee, furnish Owner with manufacturer's fully executed written limited lifetime warranty for the repair or replacement of horizontal louver blinds against defects in materials and workmanship.

PART 2 - PRODUCTS

2.1 PRODUCTS

- A. Model "CD80 1 Mini Aluminum Blind" as manufactured by Hunter Douglas Contract, or equal.

2.2 MATERIALS

- A. Slats: Aluminum alloy, 1 inch wide by .008 inch thick, heat-treated and spring tempered aluminum alloy 6011, with eased corners and manufacturing burrs removed. Furnish not less than nominal 15.2 slats per foot to ensure tight closure and light control.
- B. Slat Support: Braided ladders of 100 percent polyester yarn color compatible with slats and spacing of ladder no more than 20mm, reinforced to withstand 100 pound pull. Distance between ladders not to exceed Manufacturer's requirements.
- C. Headrail: U-shaped profile with rolled edges, measuring 1-3/8 inches x 1-3/8 inches x 0.024 inch constructed of corrosion-resistant steel, providing a beveled edge valance-free design. Ends to be fitted with 0.024 inch steel end lock with adjustable tab for centering blinds. Finish to be standard baked-on polyester and to match slats.
- D. Bottom Rail: Steel with corrosion-resistant finish formed with double-lock seam into closed oval shape for optimum beam and torsional strength. Ends fitted with color-coordinated engineered polymer caps. Finish to be standard baked-on polyester and to match slats.
- E. Lifting Mechanism: Crashproof steel cordlocks with corrosion-resistant finish, two-ply polyester cord filler in braided polyester jacket lift cords, cord equalizers, cordlock adapter, and cord stop / single pull cord. Install within 2019 CBC reach ranges 11B-308.
- F. Tilting Mechanism: Permanently lubricated die-cast worm and gear type tilter gear mechanism in fully enclosed housing with clutch action to protect ladder tapes from over rotation of the solid steel, corrosion resistant tilt rod.
- G. Tilt Control Wand: Tubular shaped 7/16 inch diameter extruded clear plastic, ribbed for positive grip and detachable without tools.
- H. Mounting Hardware: Manufacturer's standard as required for the type of installation shown.
- I. Hold-Down Brackets: Provide metal hold down brackets where blinds are to be mounted on doors.

2.3 FINISHES

- A. Aluminum: Manufacturer's standard baked-on finish in colors selected by Architect from manufacturer's available contract colors utilizing "Dust Shield" finish to inhibit dust build-up for easier maintenance.
- B. Cord and braided ladders shall be color coordinated with slat.

HORIZONTAL LOUVER BLINDS
SECTION 12 2113
3595001

2.4 FABRICATION

- A. Blind measurements shall be accurate to within plus or minus 1/8 inch or as recommended in writing by the manufacturer for the specific installation conditions.
- B. Hardware shall be enclosed in a metal head. Operating hardware shall be machine clinched to head to assure perfect alignment. Slats shall tilt to any angle by turning a transparent wand. Blinds shall fit within the window openings as detailed, unless otherwise indicated.
- C. Other materials and components not specifically described, but required for a complete and proper installation of horizontal window blinds, shall be selected by the Installer, subject to approval of the Architect. Do not intermix component parts of various manufacturers in assembled units.
- D. Prior to fabrication, verify cords and tilt devices will be accessible and operational from the floor and will not conflict with cabinets, doors, fixtures or other items. Locate on either end as directed or approved. Bring potential conflicts to Architect's attention for resolution prior to start of Work.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Prior to installation, carefully inspect and verify that the installed Work of other trades is complete to the point where this installation may properly commence.
- B. Verify that specified items may be installed in accordance with approved design.
- C. In the event of discrepancy, immediately notify the Architect. Do not proceed in discrepant areas until discrepancies have been fully resolved.

3.2 INSTALLATION

- A. Install horizontal window blinds level and true, in accordance with the Drawings and the manufacturer's recommended procedures.
- B. Blinds shall be installed inside mount, unless otherwise indicated. Consult with Architect where inside mount may not be possible.
- C. Provide 1-1/2 inch overlap at each jamb where face installations are indicated or approved.
- D. Divisions between blinds, where required, shall occur only at mullions.
- E. Install intermediate support brackets and extension brackets as needed to prevent deflection in headrail.

3.3 CLEANING AND ADJUSTING

- A. Test operation of horizontal window blind hardware before and after installation. Operation shall be smooth and uniform.
- B. Upon completion of installation, remove manufacturer's temporary labels, marks of identification. Thoroughly wash surfaces and remove foreign material. Leave entire Work in neat, orderly, clean and acceptable condition as approved. Replace damaged parts and surfaces which are not free from imperfections.
- C. Finish installation free of dirt and finger marks. Leave work area clean and free of debris.

3.4 PROTECTION

- A. Protect Work and materials of this Section prior to and during installation, and protect the installed Work and materials of other trades.
- B. In the event of damage, make repairs and replacements necessary to the approval of the Architect at no additional cost to the Owner.
- C. Exposed finishes shall be free from scratches, dents, permanent discolorations and other defects in workmanship or material.

END OF SECTION

*p:\sacramento\3595 tracy unified school district\001-000_villalovo es new shade structures\08 specifications\06 spec\04
final\hirsch\12 2113_horizontal louver blinds.docx
Last Updated: April 2, 2021*

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Manufactured, plastic-laminate-faced, modular casework and accessory items.

1.2 RELATED REQUIREMENTS

- A. Section 01 6116, Volatile Organic Compound (VOC) Content Restrictions, for VOC limits pertaining to adhesives, sealants, fillers, primers, and coatings.
- B. Section 01 8113, Sustainable Design Requirements, for CAL-Green general
- C. Section 06 4023, Interior Architectural Woodwork.
- D. Section 09 2900, Gypsum Board.
- E. Section 09 9100, Painting.
- F. Section 12 3623, Plastic-Laminate-Clad Countertops.
- G. Division 26, Electrical, for electrical outlets and fittings built into architectural casework.

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as note on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CALGreen), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- C. American National Standards Institute (ANSI):
 - 1. ANSI A208.2: Medium Density Fiberboard for Interior Use.
 - 2. ANSI/BHMA A156.9: American National Standard for Cabinet Hardware; Builders Hardware Manufacturers Association.
 - 3. ANSI/BHMA A156.18: American National Standard for Materials and Finishes; Builders Hardware Manufacturers Association.
- D. National Electrical Manufacturers Association (NEMA):
 - 1. NEMA LD3.1: "High-Pressure Decorative Laminates."
- E. Woodwork Institute (WI)/ Architectural Woodwork Manufacturers of Canada (AWMAC):
 - 1. North American Architectural Woodwork Standards (NAAWS).

MANUFACTURED PLASTIC-LAMINATE-CLAD CASEWORK
SECTION 12 3216
3595001

1.4 DEFINITIONS

- A. General: The following definitions are in conformance with those included in the referenced NAAWS document.
- B. "Exposed Exterior" surfaces include all surfaces visible when doors and drawers are closed.
 - 1. Bottoms of casework more than 4 feet above the floor will be considered an exposed surface.
 - 2. Tops of casework that are visible by building occupants from stairs, mezzanines or other elevated locations will be considered as exposed.
- C. "Exposed Interior Surfaces" surfaces exposed to view in open casework or behind glass doors.
- D. "Semi-Exposed Surfaces" are interior surfaces only exposed to view when doors or drawers are open.
- E. "Concealed Surfaces" include surfaces of sleepers, web frames, dust panels, and other surfaces that are not visible after installation.

1.5 ADMINISTRATIVE REQUIREMENTS

- A. Submittal Procedures:
 - 1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
 - 2. Sustainable Design Submittals shall comply with the additional requirement of Section 01 8113, Sustainable Design Requirements.
 - 3. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
- B. Scheduling and Coordination:
 - 1. Require casework fabricator to examine the schedule and check it for timing, accuracy and compatibility with its work and shall coordinate work with the master schedule and job superintendent.
 - 2. Require casework fabricator to furnish assistance in coordination and scheduling of other work pertinent to casework installation and to notify Contractor of requirements so as to result in a well-coordinated job.

1.6 ACTION SUBMITTALS

- A. Shop Drawings:
 - 1. Submit dimensioned plans, elevations, component profiles, and details for each casework layout showing the following:
 - a. Locations and type of service fixtures with lines thereto; anchorage locations, installation details to floors and walls.

MANUFACTURED PLASTIC-LAMINATE-CLAD CASEWORK
SECTION 12 3216
3595001

- b. Relationship of units in to surrounding and adjacent construction including walls, doors, and windows.
 - c. Swing of doors.
 - d. Shelving.
 - e. Accessory items such as fillers, end panels, and valance.
 - f. Base height.
 - 2. First page of shop drawings and each elevation shall bear an individually serial-numbered WI "Certified Compliance Label."
- B. Product Data:
- 1. Provide manufacturers cut sheets for all materials proposed for use including:
 - a. Panel products.
 - b. Cabinet hardware items.
 - c. Laminates.
 - 2. Include manufacturer's literature for items which are proposed for use and specified herein only by listing the intended performance requirements.
- C. Samples: The following samples are required.
- 1. Each type of high pressure laminate (HPL), edge banding, cabinet liner, and melamine-faced panel.
 - a. Plastic laminate and edge banding to be selected from manufacturers' full range of colors by Architect.
 - 2. Hardware: Adjustable shelf clip, hinge, pull, magnetic catch, elbow catch and lockset. Returned hardware samples may be used on the project unless otherwise noted by the Architect.

1.7 INFORMATIONAL SUBMITTALS

- A. Before delivery of casework to jobsite, submit a WI "Certified Compliance Certificate" listing the items certified, the applicable NAAWS Grade, and whether installation is included.
- B. Qualification Data: For installer.
- C. Sample of manufacturers' warranty.
- D. Sustainable Design:
 - 1. General:
 - a. Submit information necessary to establish and document compliance with the California Green Building Standards Code.
 - b. Sustainable design submittals are in addition to other submittals.
 - 2. The following information shall be provided:
 - a. Composite Wood: Evidence of compliance that products meet formaldehyde limits of current CARB Airborne Toxic Control Measure (ATCM) as specified in Section 01 6116.

MANUFACTURED PLASTIC-LAMINATE-CLAD CASEWORK
SECTION 12 3216
3595001

- b. Adhesives and Sealants: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.

1.8 CLOSEOUT SUBMITTALS

- A. Warranty: Submit executed warranty.
- B. **[Specified maintenance materials]**

1.9 MAINTENANCE MATERIAL SUBMITTALS

- A. Provide additional materials as follows:
 - 1. Hinges: 10 each.
 - 2. Pulls: 10 each.
 - 3. Cabinet Locks: 10 each.
 - 4. Adjustable Shelf Supports: 25 each.
- B. Deliver to Owner as directed.

1.10 QUALITY ASSURANCE

- A. General:
 - 1. Furnish all components and accessories and all allied products new and free from defects.
 - 2. To assure proper coordination and eliminate divided responsibility, all work specified in this Section shall be executed under the direction of a single manufacturer and supplier.
- B. Qualifications:
 - 1. Manufacturer: The casework manufacturer must have not less than 5 years of production experience similar to this project, and the specified product, and whose qualifications indicate the ability to comply with the requirements of this section.
 - 2. Installer: The installer must have at least one project in the past 5 years with similar systems and complexities to those required for this project, and where the value of the woodwork is a minimum of 80% of the cost of woodwork for this project.
- C. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.
- D. Single-Source Responsibility: Use materials and products of one manufacturer whenever possible.
- E. Materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.
- F. Casework Designations:

MANUFACTURED PLASTIC-LAMINATE-CLAD CASEWORK
SECTION 12 3216
3595001

1. Reference numbers on Drawings are related to NAAWS Cabinet Design Series (CDS) Elevation numbers, and are used to identify prefinished casework and to indicate dimensions, general design, equipment, shelving (adjustable and fixed) and other components to be furnished. Unless modified by notation on Drawings, description for indicated number shall constitute requirements for such cabinets incorporating all features set forth in the NAAWS CDS Elevations.
 2. Use of the NAAWS CDS Elevations numbers, and specific requirements set forth on the Drawings and as specified, are not intended to preclude use of other manufacturer's product or procedure, which may be equal thereto, but are given to establish standard of design and quality of materials, construction and workmanship.
- G. Proof of compliance with the specified NAAWS Grade assembly and installation shall be provided by the following WI Quality Control Program:
1. WI Monitored Compliance Program.
 - a. All casework and the installation thereof for this project shall be directly monitored for compliance to the Contract by the Woodwork Institute under the scope of their Monitored Compliance Program (MCP).
 - 1) Inspections are to be performed at the beginning of fabrication, at the time of delivery to the job, at the beginning of installation, at completion of installation.
 - 2) Further information on the WI Monitored Compliance Program's Policies and Procedures are available directly from the Woodwork Institute, 916-372-9943.
 - 3) The WI MCP Registration Number shall be referenced in all communication.
 - b. Fees charged by the Woodwork Institute for their monitored compliance service are the responsibility of the Contractor and shall be included in the Contract sum.
 - c. Casework and/or installation determined to be non-compliant by WI and not corrected will be rejected.
 - d. Issuance of the WI Monitored Compliance Certificate is a prerequisite of the Owner's final acceptance.
- H. Mockups: Provide mockup of one base cabinet and one wall hung cabinet to verify finish material selections, modifications made under sample submittals, and to demonstrate aesthetic effects and set quality standards for materials and execution for cabinet exteriors, interior construction, and hardware.
1. The base cabinet is to have at least one drawer and be of the same material to be provided for the project.
 2. The approved mockup may be incorporated in the project.
- 1.11 DELIVERY, STORAGE AND HANDLING**
- A. Deliver undamaged products to job in manufacturer's sealed containers and/or original bundles with tags and labels intact.

MANUFACTURED PLASTIC-LAMINATE-CLAD CASEWORK

SECTION 12 3216

3595001

- B. Store materials in protected, dry conditions off of ground and in areas so as to not interfere with the progress of the work.
- C. Transport, store and handle in strict accordance with the manufacturer's recommendations.
- D. Do not deliver until wet operations in building are completed and storage area is closed in and broom clean, with relative humidity 50 percent or less at 70 degrees F.
- E. Deliver in sections to fit through openings.

1.12 FIELD CONDITIONS

- A. Environmental Limitations: Do not deliver or install casework until building is enclosed, wet-work is complete, and HVAC system is operating and maintaining temperature and relative humidity at levels planned for building occupants during the remainder of the construction period.
- B. Products shall be available at project when required for installation so as not to delay job progress. Installer for these products shall cooperate with installers performing work under other sections involved to effect proper installation.
- C. Casework fabricator shall coordinate installation of any Owner supplied equipment where indicated on the Drawings.
- D. Field Measurements: Make and be responsible for all field dimensions necessary for proper fitting and completion of work. Report discrepancies to Architect before proceeding.

1.13 WARRANTY

- A. Manufacturer: In addition to the Contractor's Standard Guarantee, furnish Owner with manufacturer's fully executed written 5-year warranty for casework against defects in materials and workmanship. Warranty shall include against delaminations, joint separations, warp or twist in doors more than 1/4 inch, and splits or cracks in finished surfaces.

PART 2 - PRODUCTS

2.1 DESIGN AND PERFORMANCE CRITERIA

- A. Sustainable Design:
 - 1. Composite wood products must meet current formaldehyde emission limits of CARB Airborne Toxic Control Measure (ATCM) as specified in Section 01 6116.
 - 2. VOC emissions for field-applied adhesives, sealants, and sealant primers must comply with limits specified in Section 01 6116.

2.2 PANEL MATERIALS

- A. Medium-Density Fiberboard (MDF): ANSI A208.2, Grade 155, formaldehyde-free, and meeting grade MR30 moisture resistance; "Medite II," by Roseburg, or equal.
 - 1. Thickness: 3/4 inch, unless otherwise shown or specified.
- B. Thermally-Fused Melamine Panels (TFM): Melamine resin-impregnated decorative paper thermally fused to a formaldehyde free MDF core.
 - 1. Color: White, unless otherwise noted or selected by Architect from a minimum of 6 colors.
- C. Plywood: Exterior type, Grade B-C or better. Plywood to be free of urea-formaldehyde.
- D. Hardboard: Tempered Grade, conforming to standards of American Hardboard Association or PS-50; use smooth side exposed.
- E. Particle Board: Not permitted.

2.3 LAMINATE MATERIALS

- A. High-Pressure Plastic Laminate: Conforming to NEMA LD3.1 and ISO 4586-2.
 - 1. Grades:
 - a. Horizontal Surfaces: ISO 10/HGS; horizontal, general purpose, standard.
 - b. Vertical Surfaces: ISO 20/VG; vertical, general purpose.
 - c. Cabinet Liner (If Specified TFM Panel is Not Used): ISO 72/CLS, cabinet liner, standard.
 - d. Backing Sheet: ISO 91/BKL; backer, light duty.
 - 2. Manufacturers: Formica, Wilsonart, Arborite, Pionite, Nevamar, or equal.
 - 3. Colors, and Patterns:
 - a. Exposed: As selected by Architect from manufacturer/suppliers' full product color range.
 - 1) There will be no additional cost allowance for premium color selections, or for selection of different colors for different rooms up to a maximum 6 colors.
 - 2) Doors and frames may be different selections.
 - b. Cabinet Liner: White.

2.4 ADDITIONAL MATERIALS

- A. Edge Bandings:
 - 1. 3-mm thick PVC: Solid, high impact, purified, color-thru, acid resistant, pre-laminated primed edging, machine-applied with hot melt adhesives, automatically trimmed, inside/outside length-radiused for uniform appearance, buffed and corner-radiused for consistent design.
 - a. Locations: Door and drawer face edge, and exposed shelf edge.

MANUFACTURED PLASTIC-LAMINATE-CLAD CASEWORK

SECTION 12 3216

3595001

- b. Color: As selected by Architect from manufacturer's full range of standard colors.
- 2. 0.02-inch thick PVC: Flat Edge, solid, high impact, purified, color-thru, acid resistant PVC, edging machine-applied with hot melt adhesives, automatically trimmed face, back and corners for uniform appearance.
 - a. Locations:
 - 1) Drawer body edge, not drawer face, and cabinet body edge including door and drawer front spacer rail.
 - 2) Interior body component edging, interior dividers and interior shelving.
 - b. Color: Match cabinet interior surface color.

2.5 HARDWARE

- A. Comply with requirements of BHMA A156.9, Type 2 (Institutional).
- B. Finishes:
 - 1. Exposed Items: Satin chromium plated, 626, unless otherwise noted complying with ANSI/BHMA A156.18.
 - 2. Concealed Items: Manufacturer's standard finish, complying with applicable product class of ANSI/BHMA A156.9.
- C. Hinges:
 - 1. Type: Heavy duty, five knuckle, 2-3/4-inch, institutional type hinge; let into door to achieve 1/8 inch reveals; Part Number 374 by Rockford Process Control, or equal, unless otherwise recommended by fabricator for total door and side panel thickness after application of laminate finish.
 - a. Hinges shall be mill ground, hospital tip, tight pin feature with all edges eased.
 - b. Hinges to be full wrap around type of tempered steel 0.095 inch thick.
 - c. Hinges shall accommodate 3/4 inch thick laminated door and allow 270 degree swing.
 - 2. Fasteners: Each hinge to have minimum 9 screws, #7, 5/8 inch FHMS to assure positive door attachment. Fill all holes if greater than 9.
 - 3. Quantity:
 - a. One pair per door to 48 inches in height.
 - b. One and one-half pair 48 inches in height to 84 inches in height.
 - c. Over 84 inches in height, provide 2 pair of hinges.
- D. Door and Drawer Pulls: Hafele, Catalog No. 110.08.400, or equal.
- E. Magnetic Catches: Häfele 246 with matching strike plate, matt nickel finish, or equal.
- F. Locks: CompX National Lock C8100 Series pin tumbler, or equal.
 - 1. All cabinets in each Room to be keyed alike.
 - 2. All Rooms to be keyed different.

MANUFACTURED PLASTIC-LAMINATE-CLAD CASEWORK
SECTION 12 3216
3595001

- 3. Locations: As indicated on the Drawings.
- G. Locks: Schlage CL2000 Series cabinet and drawer locks with solid brass 6 pin cylinders.
 - 1. Locks in rooms keyed alike; rooms keyed differently.
- H. Surface Bolt for Locked Pair Doors: Elbow Catch: #2 Elbow Catch by Ives, or equal.
 - 1. Finish: Satin chrome.
 - 2. Locate and mount surface bolt on door far enough below shelf to allow for 1/2-inch deflection of shelf and also to allow for proper engagement of surface bolt and angle strike.
- I. Drawer Guides: Accuride as specified, or equal:
 - 1. Drawers Less Than 24 inches Wide: Light duty, full extension; Model 3732.
 - a. Provide appropriate length.
 - b. Load Rating per Pair: 100-pounds.
 - 2. Drawers 24 inches to 36 Inches Wide: Medium duty with 1-inch over travel; Model 3301.
 - a. Provide appropriate length.
 - b. Load Rating per Pair: 150-pounds.
 - 3. Drawers 36-inches to 42-inches Wide: Heavy-duty with 1-inch over travel; Model 3634.
 - a. Provide appropriate length.
 - b. Load Rating per Pair: 200-pounds.
 - 4. Drawers 42-inches to 48-inches Wide: Heavy duty with 1-inch over travel; Model SS5321.
 - a. Provide appropriate length.
 - b. Load Rating per Pair: 350-pounds.
- J. Adjustable Shelf Supports: Seismic restraining type; "Universal 1" by Hettich International for insertion into 5 mm holes, or equal.

2.6 ADDITIONAL MATERIALS

- A. Bumper Pads (Silencers): Hemispherical, quiet clear type, 55 Shore A hardness; 3M Bumpon Protective Products, or equal.
- B. Adhesive: As recommended by panel manufacturer best suited for the intended use and that has a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
- C. Glue: Aliphatic-resin, polyurethane, or resorcinol wood glue recommended by manufacturer for general carpentry use that has a VOC content of 30 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
- D. Fasteners: Size and type to suit application in accordance with specified standards and as required.

MANUFACTURED PLASTIC-LAMINATE-CLAD CASEWORK
SECTION 12 3216
3595001

2.7 FABRICATION - GENERAL

- A. Construction shall conform to NAAWS casework requirements.
- B. Make job measurements as required for proper fabrication of the work.
- C. Grade: Custom. If provisions for the NAAWS Grade are in conflict with, or modified by the drawings and/or specifications, the modifications shall govern.
- D. Door and Drawer Front Style: Flush overlay, NAAWS Style A.
- E. Carcass Construction: Type A frameless. Provide as single unit at open shelving to greatest extent possible.

2.8 FABRICATION OF CABINET COMPONENTS

- A. Cabinet Bodies:
 - 1. Fabricate, assemble and finish each cabinet as complete, self-supporting unit.
 - a. Unless otherwise shown, counter height and tall storage units shall be 24 inches minimum overall depth; wall-hung units shall be 15 inches minimum overall depth.
 - b. At concealed locations, provide tops on all wall-hung and tall cabinets utilizing melamine on both faces.
 - c. At locations where the tops of wall hung or tall cabinets are visible, provide tops on all wall-hung and tall cabinets utilizing HPL on exterior face and melamine on interior face.
 - d. Fabricate bottoms, tops and frames of lock-joint glued and screwed, or dowelled and glued construction to end panel construction. Simple butted not permitted.
 - e. Tops and sides of tall units and wall-hung cabinets shall be 3/4-inch thick MDF core.
 - f. Bottoms of upper cabinets shall be constructed of same materials as specified for shelving.
 - g. Tall cabinets and base cabinets, fronts and sides shall be 3/4-inch thick MDF core.
 - h. Cabinet backs shall be a minimum of 1/4-inch thick.
 - i. Dowel and screw partitions and boxed shelves into top framing, bottoms or ends, as applicable.
 - j. Middle shelf of tall cabinets, 5 feet or greater in height, shall be fixed.
 - k. At top of counter height units, provide 3/4-inch plywood boxed subframe, mortised and tenonned, glued and screwed, for concealed attachment of countertop and for cabinet rigidity.
 - l. Provide toe space on floor-mounted units.
 - m. For tall units and wall-mounted cabinets, include 5/8 inch x 3 inch concealed wood strips full length at top and bottom, for screw or bolt anchorage to wall to conform to pull requirements of Title 24.
 - n. Holes for Shelf Support Clips: 32mm on center.

MANUFACTURED PLASTIC-LAMINATE-CLAD CASEWORK
SECTION 12 3216
3595001

- 1) Provide 2 holes on each side of shelf except provide a 3rd hole where cabinets are deeper than 24 inches.
 - 2) Locations shall be confirmed with Architect.
 - o. The fabrication of casework must allow for shim space at the base of the cabinets, to account for field conditions, as required so that the height from finish floor to top of counter, and sink rim where occurs, does not exceed the specified height at any location along the countertop after installation.
 - 2. Finishing:
 - a. Exposed Interior Surfaces and Semi-Exposed Surfaces:
 - 1) Melamine bonded to MDF core; specified TFM panel.
 - 2) Use for all semi-exposed surfaces, tops and bottoms of wall-hung and tall cabinets except as otherwise specified, concealed ends, partitions, and drawer boxes.
 - 3) See "Shelves" Paragraph for panel and finish requirements for shelving.
- B. Drawers:
- 1. Fabrication:
 - a. Fabricate and assemble drawer boxes with subfront and back glued and screwed into tenons at drawer sides.
 - b. Fronts shall be 3/4 inch thick MDF.
 - c. Sides: 1/2 inch thick MDF to create drawer box subfront, sides, back and bottom.
 - d. Extend bottom into dados with glue and screws at all 4 edges, using 1/4-inch materials matching the sides and backs.
 - e. At drawers over 30 inches wide, provide 1/2-inch bottoms.
 - f. Install 2-drawer guides for each drawer with positive closing and stop device to prevent inadvertent removal.
 - g. Drawer boxes to be full height of drawer opening.
 - h. Attach drawer front to subfront with #8 x 1-inch pan head wood screws (P.H.W.S.)
 - i. Provide closing stops at the rear of both drawer sides, unless stops are built into the slides to prevent the drawer front from impacting the cabinet body.
 - 2. Finishing:
 - a. Drawer Front: Vertical grade high-pressure laminate (HPL).
 - b. Interior Face of Drawer Front: Cabinet liner.
 - c. Band all 4 edges of drawer front with specified banding material.
 - d. Provide TFM panel with melamine finish on both faces, for subfront, sides, back and bottom.
- C. Doors:
- 1. Fabrication:
 - a. Panel: 3/4-inch thick MDF.

MANUFACTURED PLASTIC-LAMINATE-CLAD CASEWORK
SECTION 12 3216
3595001

- b. Hang face-mounted over cabinet, pairs parallel with proper clearance at pull edges. Install hardware.
 - c. Clearance Tolerances: Develop 1/8 inch maximum reveals.
 - 2. Finishing:
 - a. Exposed Exterior Face: Specified HPL.
 - 1) Where wood grain pattern is selected, provide pairs of doors with book-match wood grain patterns.
 - b. Exposed Interior Face: Cabinet liner.
 - c. Band all 4 edges of doors with specified banding material.
- D. Shelves:
 - 1. Fabrication - General:
 - a. Shelving to be adjustable on 1-1/4 inch centers supported by 4 adjustable shelf clips.
 - b. Loading capacity to be minimum 50 pounds per square foot, not to exceed 200 pounds on any shelf.
 - c. Shelving shall match the interior depth of the cabinet box.
 - d. Band all leading edges with edge banding material as specified.
 - 2. Shelving less than 24 inches: 3/4-inch MDF.
 - a. Finish: Melamine, both sides.
 - 3. Shelving 24 to 30 inches: 1-inch MDF.
 - a. Finish: Melamine, both sides.
 - 4. Shelving Greater than 30 inches, up to 36 inches: 1-inch, MDF.
 - a. Finish: Vertical grade HPL, both sides, applied with rigid glue line process.
 - 5. Shelving Greater than 36 inches, up to 48 inches: 1-inch plywood.
 - a. Finish: Vertical grade HPL, both sides, applied with rigid glue line process. Contact adhesive is not permitted.
- E. Scribes and Filler Panels:
 - 1. Provide matching scribes and filler panels, and scribe all cabinets to abutting walls, partitions and ceilings.
 - 2. Scribes shall not exceed 1-1/2 inches wide.
 - 3. Scribe to be covered top and bottom.
 - 4. At locations where casework wraps inside corners, provide top and bottom filler panels where voids occur.
- F. Cabinet Bases:
 - 1. If casework manufacturer chooses to use cabinet bases, they shall be 4 inches standard height.
 - 2. Fabricate completely out of 3/4-inch plywood in continuous lengths to insure straight and level installation of cabinet bodies. MDF is not acceptable for use at bases.

3. Freestanding cabinets shall have cabinet ends running directly to the floor.
4. Anchorage fasteners to be neatly installed through the back and anchor strip at the top and bottom, and middle at tall cabinets.

2.9 COORDINATION WITH APPLIANCES

- A. Contractor shall have casework manufacturer review all locations where appliances are to be installed and coordinate dimensions to ensure the correct size openings are provided.
 1. Shop drawings shall clearly indicate locations and opening dimensions.
 2. Where appliances are not in contract, shop drawings shall request confirmation of critical dimensions.
- B. Adjustments that need to be made to the casework due to appliances not fitting correctly are to be done at no additional cost to the Project.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Prior to installing casework, examine and verify that the installed work of all other trades is complete to the point where this work may properly commence.
- B. Verify that specified items may be installed in accordance with the approved design.
- C. Review in job conditions, installation requirements, and quality of completed substrate for compliance with Architect's expectations related to floor flatness for installation of casework.
- D. In the event of discrepancy, immediately notify the Architect. Do not proceed in discrepant areas until discrepancies have been fully resolved.

3.2 PREPARATION

- A. Take all necessary measurements in the field to ensure proper dimensions for cabinets prior to fabrication.
- B. Coordinate with other trades whose work adjoins, combines, or aligns with casework.
- C. Where substrate is not in compliance with Architect's expectations related to floor flatness for installation of casework, and where excessive shimming to meet these expectations would be required, level substrate using latex-modified, portland cement based or blended hydraulic-cement-based formulation as specified in Section 03 5416, Hydraulic Cement Underlayment.

3.3 INSTALLATION

- A. Install all work in conformance with the referenced NAAWS document.

MANUFACTURED PLASTIC-LAMINATE-CLAD CASEWORK
SECTION 12 3216
3595001

- B. Supervision: Installation work shall be under direct supervision of representative of manufacturer of the casework.
- C. Set work level, square and in true alignment. Cabinetwork shall fit to walls and upon completion of installation shall show no marks, indentations or other defects. Furnish scribes, filler panels, trim and molding required for finished installation. When set, each individual cabinet shall be capable of withstanding, without movement, a force of 200 pounds applied in any direction.
- D. Cabinet work shall be installed as required so that the height from finish floor to top of counter, and sink rim where occurs, does not exceed the specified height at any location along the countertop after installation.
- E. Method of attachment, including the type, size, frequency and/or spacing of anchoring devices and fasteners shall comply to NAAWS minimum requirements or be as indicated on the Drawings or as specified, whichever is more restrictive.
- F. Doors, drawers and fixtures shall operate correctly and smoothly.
- G. Furnish miscellaneous metal support and bracing required for installation. If necessary, deliver these items to other trades responsible for installation into adjacent work and designate exact location for their installation.
- H. Provide specified seismic restraining, adjustable shelf supports at all adjustable shelves to prevent shelf from sliding out of cabinets with or without doors.

3.4 ADJUSTING AND CLEANING

- A. Prior to final inspection and acceptance by the Architect, completely check each installed item and adjust for proper operation.
- B. Remove all fingerprints, smudges and the like from casework; vacuum clean drawers and interiors of dust, dirt and sawdust.

3.5 PROTECTION

- A. Protect work and materials of this Section prior to and during installation and protect the installed work and materials of other trades. Adjust all moving or operating parts to function smoothly and correctly.
- B. In the event of damage, make all repairs and replacements necessary to the approval of the Architect at no additional cost to the Owner.

END OF SECTION

p:\sacramento\3595 tracy unified school district\001-000_villalovoz es new shade structures\08 specifications\06 spec\04 final\hirsch\12 3216_manufactured plastic-laminate-clad casework.docx
Last Updated: November 1, 2021

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Plastic laminate faced counters and splashes.

1.2 RELATED REQUIREMENTS

- A. Section 01 6116, Volatile Organic Compound (VOC) Restrictions, for VOC limits pertaining to adhesives, sealants, fillers, primers, and coatings.
- B. Section 01 8113, Sustainable Design Requirements, for CAL-Green general requirements and procedures.
- C. Section 06 4023, Interior Architectural Woodwork.
- D. Section 07 9200, Joint Sealants.
- E. Section 12 3216, Manufactured Plastic-Laminate-Clad Casework; casework to receive countertops.
- F. Division 26, Electrical, for electrical outlets and fittings built into countertops.

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CAL Green), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- C. American National Standards Institute (ANSI):
 - 1. A161.2: Decorative Laminate Countertops, Performance Standards for Fabricated High Pressure.
 - 2. A208.1: Particleboard.
 - 3. A208.2: Medium Density Fiberboard (MDF) for Interior Applications.
- D. International Organization for Standardization (ISO):
 - 1. 4586-2: "High-pressure decorative laminates (HPL, HPDL) - Sheets based on thermosetting resins (usually called laminates) - Part 2: Determination of properties."
- E. Woodwork Institute (WI): North American Architectural Woodwork Standards (NAAWS) published jointly by WI and the Architectural Woodwork Manufacturers of Canada (AWMAC).

PLASTIC-LAMINATE-CLAD COUNTERTOPS
SECTION 12 3623
3595001

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Submittal Procedures:
 - 1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
 - 2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
 - 3. Sustainable Design Submittals shall comply with the additional requirement of Section 01 8113, Sustainable Design Requirements.

1.5 ACTION SUBMITTALS

- A. Shop Drawings: Prepare for each countertop in accordance with Section 1 Article entitled "Submittals" of the referenced NAAWS document.
 - 1. Show items interfacing with countertops including relationship to supporting casework.
 - 2. Identify materials to be used.
 - 3. Shop drawings for countertops may be submitted as part of shop drawings prepared and submitted under Section 12 3216, Manufactured Plastic-Laminate-Clad Casework.
- B. Samples: 8 by 10-inch piece of selected pattern and color of plastic laminate.

1.6 INFORMATIONAL SUBMITTALS

- A. Before delivery of countertops to jobsite, submit a WI "Certified Compliance Certificate" listing the items certified, the applicable NAAWS Grade, and whether installation is included.
- B. Sustainable Design:
 - 1. General:
 - a. Submit information necessary to establish and document compliance with the California Green Building Standards Code.
 - b. Sustainable design submittals are in addition to other submittals.
 - 2. The following information shall be provided:
 - a. Adhesives and Sealants: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.
 - b. Composite Wood: Evidence of compliance that products meet formaldehyde limits of current CARB Airborne Toxic Control Measure (ATCM) as specified in Section 01 6116.
- C. Qualification Data: For fabricator.

1.7 CLOSEOUT SUBMITTALS

- A. Guarantee: Submit extended Contractor guarantee.

1.8 MAINTENANCE MATERIAL SUBMITTALS

- A. Grommets: 5 of each Type.

1.9 QUALITY ASSURANCE

- A. Fabricator Qualifications: Active member of WI. Other fabricators will be considered for approval upon submission of at least 5 years of verifiable evidence of experience in successful completion of work similar to work of this Project. This provision does not waive compliance with specified WI certification.
- B. Standard for Materials and Workmanship:
 - 1. Comply with the applicable requirements of Section 11 - Countertops of the "North American Architectural Woodwork Standards (NAAWS)" published jointly by WI and AWMAC. (hereinafter referred to as "woodworking standard").
 - 2. Where Contract Documents indicate requirements that conflict with or augment the woodworking standard, comply with the conflicting or augmenting requirements.
- C. Materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.
- D. Proof of compliance with the specified NAAWS Grade assembly and installation shall be provided by the following WI Quality Control Program:
 - 1. WI Monitored Compliance Program.
 - a. All countertops and the installation thereof for this project shall be directly monitored for compliance to the Contract by the Woodwork Institute under the scope of their Monitored Compliance Program (MCP).
 - 1) Inspections are to be performed at the beginning of fabrication, at the time of delivery to the job, at the beginning of installation, at completion of installation.
 - 2) Further information on the WI Monitored Compliance Program's Policies and Procedures are available directly from the Woodwork Institute, 916-372-9943.
 - 3) The WI MCP Registration Number shall be referenced in all communication.
 - b. Fees charged by the Woodwork Institute for their monitored compliance service are the responsibility of the Contractor and shall be included in the Contract sum.
 - c. Countertops and/or installation determined to be non-compliant by WI and not corrected will be rejected.
 - d. Issuance of the WI Monitored Compliance Certificate is a prerequisite of the Owner's final acceptance.

PLASTIC-LAMINATE-CLAD COUNTERTOPS
SECTION 12 3623
3595001

1.10 DELIVERY, STORAGE, AND HANDLING

- A. Do not deliver products until wet work, painting, and similar operations in storage and installation areas that could damage or soil work have been completed.
- B. Protect products during transit, delivery, storage, and handling so as to prevent damage, soiling, and deterioration.
- C. Store countertops only in areas where ambient conditions required can be and are maintained.
- D. Coordinate delivery with fabrication and installation of casework.

1.11 FIELD CONDITIONS

- A. Products shall be available at project when required for installation so as not to delay job progress. Contractor shall have its installer for these products cooperate with installers performing work under other Sections involved to effect proper installation.
- B. Environmental Limitations: Do not deliver or install countertops until building is enclosed, wet-work is complete, and HVAC system is operating and maintaining temperature and relative humidity at levels planned for building occupants during the remainder of the construction period.
- C. Field Measurements: Where countertops are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication and indicate measurements on shop drawings.

1.12 GUARANTEE

- A. Contractor: In addition to its standard Guarantee under the Contract, furnish Owner a special extended written 5-year guarantee, cosigned by installer, agreeing to repair or replace plastic-laminate-clad countertops that fail to perform as required within guarantee period as a result of failure of materials or installation workmanship at no additional cost to the Owner.

PART 2 - PRODUCTS

2.1 DESIGN AND PERFORMANCE CRITERIA

- A. Sustainable Design:
 - 1. VOC emissions for field-applied adhesives, sealants, and sealant primers must comply with limits specified in Section 01 6116.
 - 2. Composite wood products must meet current formaldehyde emission limits of CARB Airborne Toxic Control Measure (ATCM) as specified in Section 01 6116.

2.2 PANEL MATERIALS

- A. Medium-Density Fiberboard (MDF): ANSI A208.2, Grade 155, formaldehyde free. 3/4 inch thick unless otherwise indicated.

1. Typical Locations: Meeting grade MR30 moisture resistance; "Medite II," by Roseburg, or equal.
 2. At Sinks and Adjoining Countertops on Same Wall: Meeting grade MR50 moisture resistance; "Medex," by Roseburg, or equal.
- B. Particleboard: Not permitted.

2.3 LAMINATE MATERIALS

- A. High-Pressure Plastic Laminate: Conforming to ISO 4586-2.
- B. Grades:
1. Horizontal Surfaces and Backsplash: ISO 10/HGS; horizontal, general purpose.
 2. Postforming: ISO 12/HGP; horizontal, general purpose, postformable.
 3. Backing Sheet: ISO 91/BKL; backer, light duty.
- C. Manufacturers: Formica, Wilsonart, Arborite, Pionite, Nevamar, or equal.
- D. Colors, and Patterns: As selected by Architect from manufacturer/suppliers' full product color range.
1. There will be no additional cost allowance for premium color selections, or for selection of different colors for different rooms up to a maximum 6 colors.

2.4 ACCESSORIES

- A. Edge Treatment: Same as laminate cladding on horizontal surfaces.
- B. Grommets: Doug Mockett & Co. Inc., Manhattan Beach, CA, 310-318-2491, or equal.
1. Type: SG Series, or EDP Series; coordinate data connection requirements with Owner.
 2. Material and Color: As selected by Architect.
- C. Countertop Braces: A&M Brace as manufactured by A & M Hardware, Inc. or equal.
1. Size brace appropriate with size of countertop.
 2. Provide Häfele "Hebgo" (1100 lb. capacity) bracket, or equal at locations where continuous raceway runs directly below countertop brace.
 3. Provide largest brace available for given countertop depth to achieve maximum countertop support.
 4. Color: As selected by Architect from full range of manufacturer's standard colors. Multiple colors may be selected.
- D. Fasteners: Type and size as required.
- E. Adhesives: VOC compliant and passing NAAWS "Heat Resistance Test.". Do not use adhesives that contain urea formaldehyde.

PLASTIC-LAMINATE-CLAD COUNTERTOPS
SECTION 12 3623
3595001

2.5 FABRICATION

- A. General:
 - 1. Obtain field measurements, and verify dimensions before fabricating work.
 - 2. Comply with NAAWS Custom Grade requirements and ANSI A161.2.
- B. Core Material: Specified MDF.
- C. Fabricate to dimensions, profiles, and details shown.
- D. Build up countertop thickness to 1-1/2 inches at front, back, and ends with additional layers of core material laminated to top.
- E. Provide specified backing sheet at configurations and installation conditions recommended in the woodworking standard.
- F. All other Countertops: Provide roll-form 180-degree edge.
- G. Unless otherwise shown, round projecting or outside corners with 3/4-inch minimum radius or clip 45-degree angle corner.
- H. Provide joints only where maximum available lengths or countertop configuration requires a joint and where interfacing with existing. Where joints are required, balance and center. Make joints neat, flush and watertight.
- I. To greatest extent possible, complete fabrication and assembly before shipment to site.
 - 1. Disassemble components only as necessary for shipment and installation.
 - 2. Where necessary for fitting at site, provide extra borders and edges so as to allow scribing and trimming to fit.
- J. Precut openings for applied fixtures and fitting, where possible. Field cuts shall be performed by the fabricator.
- K. Conceal all fasteners.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Verify that backing has been installed at appropriate locations for anchorage.
- B. Examine shop-fabricated work for completion. Complete work as required.

3.2 INSTALLATION

- A. Install countertops in accordance with Section 11 of the NAAWS and requirements shown on the Drawings.

PLASTIC-LAMINATE-CLAD COUNTERTOPS

SECTION 12 3623

3595001

- B. Install countertops and backsplashes with concealed fastenings, securely attaching to cabinet bases or countertop braces / brackets at 36 inches on center maximum. Scribe neatly to walls or other adjoining surfaces.
- C. Make joints neatly, with uniform appearance.
- D. Install work plumb, level, true, and straight, with no distortions. Install with no variation in flushness of adjoining surfaces.
- E. Countertops shall be installed as required so that the height from finish floor to top of counter, and sink rim where occurs, does not exceed the specified height at any location along the countertop after installation.
- F. Shim as required, using concealed shims.
- G. Sealant: Install sealant as specified in Section 07 9200, Joint Sealants, to close small unavoidable gaps between counter and abutting surfaces, and at sinks. Sealant shall not be a substitute for tightly scribed work.
- H. Install, at no additional charge, extra stock grommets where directed by Owner following completion of countertop installation.

END OF SECTION

*p:\sacramento\3595 tracy unified school district\001-000_villalovoz es new shade structures\08 specifications\06 spec\04 final\hirsch\12 3623_plastic-laminate-clad countertops.docx
Last Updated: November 12, 2021*

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes
 - 1. This section describes the basic requirements for the electrical work on this project.

1.2 REFERENCES

- A. National Electrical Contractors Association (NECA): Standard of Installation
- B. National Fire Protection Association (NFPA): 70E
- C. National Safety Council (NSC)
- D. Occupational Safety and Health Administration (OSHA)

1.3 SUBMITTALS

- A. Product Data
- B. Operation and Maintenance (O&M) Manuals
- C. Field Test Reports

1.4 QUALITY ASSURANCE

- A. Reference to Codes, Standards, Specifications and recommendations of technical societies, trade organizations and governmental agencies shall mean that latest edition of such publications adopted and published prior to submittal of the bid. Such codes or standards shall be considered a part of this Specification as though fully repeated herein.
- B. When codes, standards, regulations, etc. allow Work of lesser quality or extent than is specified under this Division, nothing in said codes shall be construed or inferred authority for reducing the quality, requirements, or extent of the Contract Documents. The Contract Documents address the minimum requirements for construction.
- C. Work shall be performed in accordance with all applicable requirements of the edition indicated on the drawings of all governing codes, rules and regulations including but not limited to the following minimum standards, whether statutory or not:
 - 1. California Electric Code (CEC)
 - 2. California Building Code (CBC)
 - 3. California Green Building Code (CGC)
 - 4. California Fire Code (CFC)

ELECTRICAL BASIC REQUIREMENTS

SECTION 26 0100

3595001000

5. California Energy Code (CENC)
 6. California Mechanical Code (CMC)
 7. California Plumbing Code (CPC)
- D. Standards: Equipment and materials specified under this Division shall conform to the following standards where applicable:
1. ACI American Concrete Institute
 2. ANSI American National Standards Institute
 3. ASTM American Society for Testing Materials
 4. CBM Certified Ballast Manufacturers
 5. ETL Electrical Testing Laboratories
 6. FS Federal Specification
 7. IEEE Institute of Electrical and Electronics Engineers, Inc.
 8. IPCEA Insulated Power Cable Engineer Association
 9. NEMA National Electrical Manufacturer's Association
 10. UL Underwriters' Laboratories
- E. Independent Testing Agency qualifications:
1. Testing Agency shall be an independent testing organization that will function as an unbiased authority, professionally independent of Manufacturer, Supplier and Contractor, furnishing and installing equipment or system evaluated by Testing Agency.
 2. Testing Agency shall be regularly engaged in the testing of electrical equipment, devices, installations, and systems.
 3. Testing Agency shall meet Federal Occupational Safety and Health Administration (OSHA) requirements for accreditation of independent testing laboratories, Title 9, Part 1907.
 4. On-site technical personnel shall be currently certified by the International Electrical Testing Association in electrical power distribution system testing.
 5. Testing Agency shall use technicians who are regularly employed by the firm for testing services.
 6. Contractor shall submit proof of above Testing Agency qualifications with bid documentation upon request.
- F. All base material shall be ASTM and/or ANSI standards.
- G. All electrical apparatus furnished under this Section shall conform to NEMA standards and the NEC and bear the UL label where such label is applicable.
- H. Certify that each welder performing Work has satisfactorily passed AWS qualification tests for welding processes involved and, if pertinent, has undergone re-certification.

PART 2 - PRODUCTS

- A. SEE SCHEDULES ON ELECTRICAL PLANS and other Division 26 sections

PART 3 – EXECUTION

3.1 ROUGH-IN

- A. Contractor shall verify lines, levels and dimensions indicated on the construction document drawings and shall be responsible for the accuracy of the setting out of Work and for its strict conformance with existing conditions at the Project site.
- B. Verify final locations for rough-ins with field measurements and with the requirements for the actual equipment to be connected.
- C. Refer to equipment specifications in other sections for equipment rough-in requirements.

3.3 INSTALLATION

- A. Preparation, sequencing, handling, and installation shall be in accordance with Manufacturer's written instructions and technical data particular to the product specified and/or accepted equal except as otherwise specified.
- B. Comply with Shop Drawings prepared by Manufacturer.
- C. Verify all dimensions by field measurements.
- D. Arrange for chases, slots, and openings in other building components during progress of construction, to allow for electrical installations.
- E. Coordinate the installation of required supporting devices and sleeves to be set in poured-in-place concrete and other structural components, as they are constructed.
- F. Sequence, coordinate and integrate installations of electrical materials and equipment for efficient flow of the Work. Give particular attention to large equipment requiring positioning prior to closing in the building.
- G. Where mounting height is not detailed or dimensioned, contact the Architect for direction prior to proceeding with rough-in.
- H. Coordinate connection of electrical systems with exterior underground and overhead utilities and services. Comply with requirements of governing regulations, franchised service companies and controlling agencies. Provide required connection for each service.
- I. Install systems, materials, and equipment to conform with approved submittal data, including coordination drawings, to greatest extent possible. Conform to arrangements indicated by the construction documents, recognizing that portions of the Work are indicated only in diagrammatic form. Where coordination requirements conflict with individual system requirements, refer conflict to the Architect.

ELECTRICAL BASIC REQUIREMENTS

SECTION 26 0100

3595001000

- J. Install systems, materials, and equipment level and plumb, parallel and perpendicular to other building systems and components, where installed exposed in finished spaces.
- K. Install electrical equipment to facilitate servicing, maintenance and repair or replacement of equipment components. As much as practical, connect equipment for ease of disconnecting, with minimum of interference with other installations.
- L. Coordinate electrical systems, equipment, and materials installations with other building components.
- M. Provide access panel or doors where devices or equipment are concealed behind finished surfaces.
- N. Install systems, materials and equipment giving right-of-way priority to other systems that are required to maintain a specified slope.
- O. Conform to the National Electrical Contractors' Association "Standard of Installation" for general installation practice.

3.3 CUTTING, PATCHING, PAINTING, AND SEALING

- A. Structural members shall in no case be drilled, bored, or notched in such a manner that will impair their structural value. Cutting of holes, if required, shall be done with core drill and only with the approval of the Architect and Structural Engineer.
- B. Protection of Installed Work: During cutting and patching operations, protect adjacent installations.
- C. Application of joint sealers:
 - 1. General: Comply with joint sealer Manufacturers' printed application instructions applicable to products and applications indicated, except where more stringent requirements apply.
 - 2. Installation of fire-stopping sealant: Install sealant, including forming, packing and other accessory materials, to fill openings around electrical services penetrating floors and walls, to provide fire-stops and fire-resistance ratings indicated for floor or wall assembly in which penetration occurs. Comply with installation requirements established by testing and inspecting agency.

3.4 FIELD QUALITY CONTROL

- A. General testing requirements:
 - 1. The purpose of testing is to ensure that all tested electrical equipment, both Contractor and Owner supplied, is operational and within industry and Manufacturer's tolerances and is installed in accordance with design Specifications.

ELECTRICAL BASIC REQUIREMENTS
SECTION 26 0100
3595001000

2. Tests and inspections shall determine suitability for energization.
 3. Perform tests in presence of the Owner's Representative and furnish test equipment, facilities and technical personnel required to perform tests.
 4. Tests shall be conducted during the construction period and at completion to determine conformity with applicable codes and with these Specifications.
- B. Tests: In addition to specific system test described elsewhere, tests shall include:
1. Equipment operations: Test motors for correct operation and rotation.
 2. Lighting control circuits: Test lighting circuits for correct operation through their control devices.
 3. Alarm and interlock systems: Produce malfunction symptoms in operating systems to test alarm and interlock systems. In addition, all specific tests described in the fire alarm system shall be performed.
 4. Circuit numbering verification: Select on a random basis various circuit breakers in the panelboards and cycle them on and off to verify compliance of the typed panel directories with actual field wiring.
 5. Voltage check:
 - a. At completion of job, check voltage at several points of utilization on the system that has been installed under this Contract. During test, energize all installed loads.
 - b. Adjust taps on transformers to give proper voltage, which is 118 to 122 volts for 120 volt nominal systems and proportionately equivalent for higher voltage systems. If proper voltage cannot be obtained, inform the Owner and the serving Utility Company.
- C. Contractor shall provide test power required when testing equipment before service energization and coordinate availability of test power with General Contractor after service energization. The Contractor shall provide any specialized test power as needed or specified herein.
- D. Testing safety and precautions:
1. Safety practices shall include the following requirements:
 - a. Applicable State and Local safety operating procedures.
 - b. OSHA
 - c. NSC
 - d. NFPA 70E
 2. All tests shall be performed with apparatus de-energized and grounded except where otherwise specifically required ungrounded by test procedure.
- E. Calibration of test equipment:
1. Testing Agency shall have calibration program that assures test instruments are maintained within rated accuracy.
 2. Instruments shall be calibrated in accordance with the following frequency schedule:
 - a. Field instruments: Analog, 6 month maximum; Digital, 12 months

ELECTRICAL BASIC REQUIREMENTS

SECTION 26 0100

3595001000

- maximum.
 - b. Laboratory instruments: 12 months.
 - c. Leased specialty equipment: 12 months where accuracy is guaranteed by lessor.
 - 3. Dated calibration labels shall be visible on test equipment.
 - 4. Records, which show date and results of instruments calibrated or tested, must be kept up-to-date.
 - 5. Up-to-date instrument calibration instructions and procedures shall be maintained for test instrument.
 - 6. Calibration standards shall be of higher accuracy than instrument tested.
 - 7. Equipment used for field testing shall be more accurate than instrument being tested.
- F. Coordinate with General Contractor regarding testing schedule and availability of equipment ready for testing.
- G. Notify Owner one week in advance of any testing.
- H. Any products which fail during the tests or are ruled unsatisfactory by the Owner's Representative shall be replaced, repaired, or corrected as prescribed by the Owner's Representative at the expense of the Contractor. Tests shall be performed after repairs, replacements or corrections until satisfactory performance is demonstrated.
- I. Testing Agency shall maintain written record of tests and shall assemble and certify final test report. All test results/reports shall be submitted to the Electrical Engineer for review.
- J. Include all test results in the maintenance manuals.

3.5 CLEANING

- A. Prior to energizing of electrical equipment, the Contractor shall thoroughly clean the interior of enclosures from construction debris, scrap wire, etc. using Manufacturer's approved methods and materials.
- B. Upon completion of Project, prior to final acceptance, the Contractor shall thoroughly clean both the interior and exterior of all electrical equipment per Manufacturers approved methods and materials. Remove paint splatters and other spots, dirt, and debris.
- C. Touch-up paint any marks, blemishes or other finish damage suffered during installation.

- END OF SECTION -

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes conduit, surface raceways, J-hooks, wireways, outlet boxes, pull and junction boxes, concrete pullboxes and vaults, floor boxes.

1.2 REFERENCES

1.3 AMERICAN NATIONAL STANDARDS INSTITUTE:

- A. ANSI C80.1 - Rigid Steel Conduit, Zinc Coated.
- B. ANSI C80.3 - Specification for Electrical Metallic Tubing, Zinc Coated.

1.4 NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION:

- A. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum).
- B. NEMA FB 1 - Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit and Cable Assemblies.
- C. NEMA OS 1 - Sheet Steel Outlet Boxes, Device Boxes, Covers, and Box Supports.
- D. NEMA OS 2 - Nonmetallic Outlet Boxes, Device Boxes, Covers, and Box Supports.
- E. NEMA RN 1 - Polyvinyl Chloride (PVC) Externally Coated Galvanized Rigid Steel Conduit and Intermediate Metal Conduit.
- F. NEMA TC 2 - Electrical Polyvinyl Chloride (PVC) Tubing and Conduit.
- G. NEMA TC 3 - PVC Fittings for Use with Rigid PVC Conduit and Tubing.

1.5 SYSTEM DESCRIPTION

- A. Raceway and boxes located as indicated on Drawings, and at other locations required for splices, taps, wire pulling, equipment connections, and compliance with regulatory requirements. Raceway and boxes are shown in approximate locations unless dimensioned. Provide raceway to complete wiring system.
- B. All wiring shall be installed in raceway.
- C. Provide raceway as follows:
 - 1. Underground: Provide thickwall nonmetallic conduit. Provide cast metal boxes or nonmetallic handhole.
 - 2. In Slab Above Grade: Not permitted.
 - 3. Below Slab on Grade: Use thickwall nonmetallic conduit. Terminate with coated rigid steel elbows and short length of coated rigid steel conduit out of concrete.

RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

SECTION 26 0533

3595001000

4. Outdoor Locations, Above Grade: Provide galvanized rigid steel conduit. Provide cast metal outlet, pull, and junction boxes.
5. Wet and Damp Locations: Provide galvanized rigid steel conduit. Provide cast metal outlet, junction, and pull boxes. Provide flush mounting outlet box in finished areas.
6. Concealed Dry Locations: Provide electrical metallic tubing. Provide sheet-metal boxes. Provide flush mounting outlet box in finished areas. Provide hinged enclosure for large pull boxes where shown on drawings. Provide J-hooks when shown on plans.
7. Exposed Interior Dry Locations: Use rigid steel conduit or intermediate metal conduit below eight feet or where subject to damage. Use rigid steel conduit, intermediate metal conduit, or electrical metallic tubing above eight feet or in electrical, mechanical or telecommunication rooms. Use sheet-metal or cast metal boxes. Use flush mounting outlet box in finished areas. Provide hinged enclosure for large pull boxes.

1.6 DESIGN REQUIREMENTS

- A. Minimum Raceway Size: 0.75 inch unless otherwise specified.
- B. Minimum Raceway Size for Data Communications: 1.00 inch unless otherwise specified.
- C. Minimum Raceway Size for Telecommunications: 1.00 inch unless otherwise specified.
- D. Minimum Raceway Size for AV Systems: 1.00 inch unless otherwise specified.

1.7 CLOSEOUT SUBMITTALS

- A. Project Record Documents:
 1. Record actual routing of conduits larger than 2 inches.
 2. Record actual locations and mounting heights of outlet, pull, and junction boxes.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Protect conduit from corrosion and entrance of debris by storing above grade. Provide appropriate covering.
- B. Protect PVC conduit from sunlight.

1.9 COORDINATION

- A. Coordinate mounting heights, orientation and locations of outlets mounted above counters, benches, and backsplashes.
- B. Coordinate Work of this Division and Work of other Divisions in advance of installation. Provide additional Work to overcome tight conditions at no increase in Contract Sum.
- C. Coordinate installation of outlet boxes for equipment specified in other divisions.

PART 2 - PRODUCTS

2.1 METAL CONDUIT

- A. Rigid Steel Conduit: ANSI C80.1.
- B. Rigid Aluminum Conduit: ANSI C80.5.
- C. Intermediate Metal Conduit (IMC): Rigid steel.
- D. Fittings and Conduit Bodies: NEMA FB 1. Fittings shall be steel/malleable iron with threaded fittings. Use insulated metallic bushings with lug where ground connections are required. Use plastic bushing for non-bonding applications.

2.2 PVC COATED METAL CONDUIT

- A. Product Description: NEMA RN 1; rigid steel conduit with external PVC coating, 40 mil thick.
- B. Fittings and Conduit Bodies: NEMA FB 1; steel fittings with external PVC coating to match conduit.

2.3 FLEXIBLE METAL CONDUIT

- A. Product Description: Interlocked steel construction.
- B. Fittings: NEMA FB 1.

2.4 LIQUIDTIGHT FLEXIBLE METAL CONDUIT

- A. Product Description: Interlocked steel construction with PVC jacket.
- B. Fittings: NEMA FB 1.

2.5 ELECTRICAL METALLIC TUBING (EMT)

- A. Product Description: ANSI C80.3; galvanized tubing.
- B. Fittings and Conduit Bodies: NEMA FB 1; steel couplings and connectors. Box connectors shall have with insulated throat. Set screw type couplings.

2.6 NONMETALLIC CONDUIT

- A. Product Description: NEMA TC 2; Schedule 40 PVC.
- B. Fittings and Conduit Bodies: NEMA TC 3.

2.7 SURFACE RACEWAY (WIREMOLD)

- A. Product Description: Surface raceway as shown on plans. Raceway shall be Wiremold or equal.

RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

SECTION 26 0533

3595001000

- B. Fittings: Provide all supports, adapters, clips, elbows, covers, device fittings, and other hardware as required for a complete installation. Provide B-Line "transition" boxes to clear offset surfaces. Supports shall be concealed, exposed straps are not allowed.
- C. Finish:
 - 1. Steel raceway and associated transition boxes and exposed hardware shall be spray painted with two coats of semi-gloss acrylic enamel paint, color as directed by Architect.
 - 2. Aluminum raceway shall be provided with factory finish, color as directed by Architect. Transition boxes shall be spray painted with two coats of semi-gloss acrylic enamel paint, color as directed by Architect.
 - 3. Plastic raceway shall be provided with factory finish, color as directed by Architect. Transition boxes shall be spray painted with two coats of semi-gloss acrylic enamel paint, color as directed by Architect.
 - 4. Coordinate all colors with Architect prior to ordering.

2.8 J-HOOKS

- A. Product Description: Low voltage signal cable J-Hooks shall be Panduit. Provide with support device for construction encountered.

2.9 WIREWAY

- A. Product Description: General purpose for indoor applications and raintight type for outdoor locations wire way.
- B. Knockouts: Manufacturer's standard.
- C. Cover: Hinged cover with full gaskets.
- D. Connector: Flanged.
- E. Fittings: Lay-in type with removable top, bottom, and side; captive screws and drip shield for outdoor.
- F. Finish: Rust inhibiting primer coating with gray enamel finish.

2.10 OUTLET BOXES

- A. All boxes shall be suitable for the environment in which they are installed.
- B. Sheet Metal Outlet Boxes: NEMA OS 1, galvanized steel.
 - 1. Luminaire and Equipment Supporting Boxes: Rated for weight of equipment supported; furnish 0.5-inch male fixture studs where required.
 - 2. Boxes for shall be 1.5-inch-deep by 4-inch square minimum for single devices.
 - 3. Boxes for shall be 1.5-inch-deep by 4-11/16 inch square minimum for two devices.
 - 4. Boxes for data and signal outlets shall be 2-1/8-inch-deep by 4-11/16-inch square minimum.
 - 5. Concrete Ceiling Boxes: Concrete type.

RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

SECTION 26 0533

3595001000

6. Provide rings as required.

- C. Cast Boxes: NEMA FB 1, Type FD, aluminum. Furnish gasketed cover by box manufacturer. Furnish threaded hubs.

2.11 BOX EXTENSIONS

- A. At rooms being remodeled and where existing walls are to receive new finish material, replace existing plaster rings with new rings.

2.12 PULL AND JUNCTION BOXES

- A. Boxes having an internal volume less than 100 cubic inches shall be as specified for outlet boxes. Boxes having internal volume greater than 100 cubic inches shall be of panelboard type construction except that covers shall be secured by screws or bolts.
- B. Boxes exposed to rain or installed in wet locations shall be specifically designed for the purpose.
- C. All boxes shall be installed so that covers are accessible after completion of the installation.
- D. Boxes shall not be installed in finished areas unless specific approval for such installation is granted by Architect.

2.13 CONCRETE PULLBOXES AND VAULTS

- A. Boxes: Boxes shall be precast, high density reinforced concrete. In areas of vehicular traffic, boxes shall be H20 rated.
- B. Extensions: Extensions shall be provided at each pullbox. Provide a minimum of (1) extension. Provide additional extension(s) as required to provide space in box for code required cable bending.
- C. Covers: Covers in concrete or asphalt shall be galvanized. In all other areas, covers shall be steel checker plate. In areas of vehicular traffic, lids shall be galvanized steel, H20 rated. All covers shall be provided with hold-down bolts.
- D. Floor: Provide poured concrete slab as detailed on plans. At H20 rated boxes, provide manufacturer's concrete slab.
- E. Size: Provide size as noted on plans. If size is not shown, provide boxes sized per codes.
- F. Labeling: Covers shall be factory marked as shown on plans.

2.14 FLUSH MULTI SERVICE FLOOR BOXES (4 PORT)

- A. Floor boxes shall be cast iron, fully adjustable, Walker RFB4-CI-1 with FPBTCAL cover. Provide brackets required to mount devices shown on plans. Provide blank plates at unused ports.

RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

SECTION 26 0533

3595001000

2.15 FLUSH MULTI SERVICE FLOOR BOXES (11 GANG):

- A. Floor boxes shall be steel, fully adjustable, Walker RFB11 with RFB119BTCAL cover. Provide brackets required to mount devices shown on plans. Provide blank plates at unused ports.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify outlet locations and routing and termination locations of raceway prior to rough-in.

3.2 EXISTING WORK

- A. Remove exposed abandoned raceway, including abandoned raceway above accessible ceiling finishes. Cut raceway flush with walls and floors, and patch surfaces.
- B. Remove concealed abandoned raceway to its source.
- C. Disconnect abandoned outlets and remove devices. Remove abandoned outlets when raceway is abandoned and removed. Install blank cover for abandoned outlets not removed.
- D. Maintain access to existing boxes and other installations remaining active and requiring access. Modify installation or provide access panel.
- E. Extend existing raceway and box installations using materials and methods [compatible with existing electrical installations, or] as specified.
- F. Clean and repair existing raceway and boxes to remain or to be reinstalled.
- G. At rooms being remodeled and where existing walls are to receive new finish material, replace existing plaster rings with new rings with depth required to bring box flush with new finish. Contractor shall review Architectural drawings prior to bid to note walls receiving new finishes (tackboards, sheetrock, etc.) and include the necessary work in bid.

3.3 INSTALLATION

- A. Ground and bond raceway and boxes.
- B. Fasten raceway and box supports to structure and finishes.
- C. Identify raceway and boxes.
- D. Arrange raceway and boxes to maintain headroom and present neat appearance.

3.4 INSTALLATION - RACEWAY

- A. Raceway routing is shown in approximate locations unless dimensioned. Route to complete wiring system.

RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

SECTION 26 0533

3595001000

- B. Unless otherwise specified, all raceway shall be installed concealed. Raceway may be run exposed on unfinished walls, in attic spaces, in electrical rooms and when routed to surface panels, cabinets or gutters.
- C. Arrange raceway supports to prevent misalignment during wiring installation.
- D. Support raceway using coated steel or malleable iron straps, lay-in adjustable hangers, clevis hangers, and split hangers.
- E. Group related raceway; support using conduit rack. Construct rack using steel channel and provide space on each for 25 percent additional raceways.
- F. Do not support raceway with wire or perforated pipe straps. Remove wire used for temporary supports
- G. Do not attach raceway to ceiling support wires or other piping systems.
- H. Construct wire way supports from steel channel.
- I. Route exposed raceway parallel and perpendicular to walls.
- J. Route raceway installed above accessible ceilings parallel and perpendicular to walls.
- K. Route conduit in and under slab from point-to-point.
- L. Maintain clearance between raceway and piping for maintenance purposes.
- M. Maintain 12-inch clearance between raceway and surfaces with temperatures exceeding 104 degrees F.
- N. Cut conduit square using saw or pipe cutter; de-burr cut ends.
- O. Bring conduit to shoulder of fittings; fasten securely.
- P. Join nonmetallic conduit using cement as recommended by manufacturer. Wipe nonmetallic conduit dry and clean before joining. Apply full even coat of cement to entire area inserted in fitting. Allow joint to cure for minimum 20 minutes.
- Q. Install conduit hubs to fasten conduit to sheet metal boxes in damp and wet locations and to cast boxes.
- R. Install no more than equivalent of three 90-degree bends between boxes. Install conduit bodies to make sharp changes in direction, as around beams. Install factory elbows for bends in metal conduit larger than 2-inch size.
- S. Avoid moisture traps; install junction box with drain fitting at low points in conduit system.
- T. Install fittings to accommodate expansion and deflection where raceway crosses seismic and expansion joints.
- U. Install suitable pull string or cord in each empty raceway except sleeves and nipples.

RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

SECTION 26 0533

3595001000

- V. Install suitable caps to protect installed conduit against entrance of dirt and moisture.
- W. Surface Raceway:
 - 1. Anchor raceway to structural members using screws. Supports shall be concealed. Space screws 24" maximum on center. Each run shall have a minimum of (2) screws.
 - 2. Mount plumb and level.
 - 3. Install insulating bushings and inserts at connections to outlets and corner fittings.
 - 4. Raceway shown on plans is schematic. Contractor shall coordinate exact routing and installation with building conditions and provide all parts, pieces, elbows, transition boxes and other items as required for a complete, closed and professionally installed installation.
 - 5. Coordinate exact routing with Architect prior to installation.
- X. J-Hooks:
 - 1. Provide J-hooks 48" maximum on center.
 - 2. All cable to be run parallel and perpendicular to building lines.
 - 3. Provide mounting hardware as required.
 - 4. Provide Unistrut channels between structural members as required.
 - 5. Provide 24" long 2" conduit sleeves through walls, draft stops, etc. Provide as many as necessary to accommodate cables in contract plus two extra capped at each end for future cabling. All conduits shall be provided with bushed ends.
- Y. Close ends and unused openings in wire way.

3.5 EXCAVATING AND TRENCHING:

- A. Perform all excavations as required for the installation of the work included under this Section, including shoring of earth banks to prevent cave-ins and to protect workmen and equipment.
- B. Restore all surfaces, roadways, walks, curbs, walls, existing underground installation, etc., damaged or cut as a result of the excavations to their original condition in a manner approved by the Architect.
- C. Stop machine excavation for trenches, in solid ground, several inches above required grade line, then trim trench bottom by hand to accurate grade so that a firm and uniform bearing throughout entire length of duct is provided. In lieu of above hand excavation in bottom of trench, Contractor may excavate to depth no less than 6" below required grade line and place a bed of sand or granular soil, properly compacted to provide a uniform grade and to provide a firm support for duct throughout its entire length.
- D. Minimum conduit depth of pipe crown shall be 2'0" below finished or natural grade, unless detailed otherwise on Drawings. Conduits under parking lots, roadways, driveways, fire truck access routes, and other areas subject to vehicular traffic shall be installed a minimum of 24" below grade.

3.6 BACKFILLING:

- A. No backfilling operations shall begin until the required tests and inspection has been made. Should any of the work be enclosed or covered up before it has been approved, Contractor shall, at his expense, uncover the work.
- B. After it has been inspected, tested, and approved, he shall make all repairs necessary to restore the work of other contractors to the condition in which it was found at the time of uncovering.
- C. Except under existing paved area, walks, roads, or similar surfaces, and in cases where rock is encountered, backfill more than 12" above the top of the pipe shall be made using suitable excavated material placed in 6" layers measured before compaction, and tamped by machine.
- D. Surface work shall be replaced to match the existing.
- E. Entire backfill for bored excavations under existing pavement, walks, roads, or similar surfaces, shall be made with clean sand compacted by flooding.
- F. The contractor shall install a marking tape 6" below grade and directly above all electrical conduits. The tape shall consist of a 4 mil insert plastic film specifically formulated for prolonged use underground. It shall be highly resistant to alkalis, acids and other destructive agents found in the soil. Tape shall have a minimum tensile strength of 20 lbs. per 3" with strips and a minimum elongation of 500%. Tape shall bear a continuous painted message repeated every 16" to 36" warning of the installation buried below. The message shall read "CAUTION – ELECTRICAL POWER LINE BURIED BELOW" or "CAUTION – ELECTRICAL SIGNAL LINES BURIED BELOW" as applies. Installation instruction for the tape shall be printed with each message along the entire length. The tape shall be as that manufactured by Reef Industries, Inc., or approved equal. For those installations involving non-metallic pipe, tape shall be aluminum foil encased in two layers of inert plastic film enabling the tape to be inductively located. Terre Tape "D" Warning Tapes are acceptable. When conduit below is plastic, tape shall have metallic content and shall respond to metal detectors. Do not exclude this. It will be required to verify the installation of this tape.

3.7 FLASHING AND SEALING:

- A. Flash and counterflash roof and wall penetrations in manner described under other applicable sections of this Specification and as approved by the Architect.
- B. Conduits, ducts, etc., passing through finished walls and ceilings shall be fitted with steel escutcheon plates, chrome or paint finish as directed.
- C. Conduits which penetrate floor slabs and concrete or masonry walls shall be grouted and sealed watertight at penetration.
- D. Conduits penetrating exterior walls other than concrete or masonry shall be sealed watertight with polyurethane sealant.

RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

SECTION 26 0533

3595001000

- E. Underground conduits stubbing up into a room shall be sealed around cables or pullstring with foam sealant.
- F. All flashing and sealing shall be provided by this Contractor.

3.8 INSTALLATION – BOXES

- A. Boxes shall be accurately placed as shown on Drawings or as close thereto as possible. Contractor shall refer to Drawings, specifications, and submittals covering work of the other trades to coordinate outlet location. In the event of conflict between planned locations of outlet and other equipment or furnishing, Contractor shall not proceed until direction has been given by Architect.
- B. Unless otherwise specified or shown on Drawings, boxes shall be flush mounted with front edge of box or ring flush with wall or ceiling finish. Use plaster ring of appropriate depth in plastered or gypboard applications. Contractor shall review architectural drawings and note wall and ceiling construction and finishes for each wall.
- C. Boxes shall not be installed back-to-back in walls. To prevent sound transfer, outlets, switches, etc. shown on opposing sides of the same wall shall be installed in separate stud spaces, except that outlets installed at different elevations may occupy the same stud space when box separation exceeds 18". Where these requirements cannot be met, Contractor shall provide insulation material between boxes.
- D. Orient boxes to accommodate wiring devices.
- E. Install pull boxes and junction boxes above accessible ceilings and in unfinished areas only.
- F. In Accessible Ceiling Areas: Install outlet and junction boxes no more than 6 inches from ceiling access panel or from removable recessed luminaire.
- G. Locate flush mounting box in masonry wall to require cutting of masonry unit corner only. Coordinate masonry cutting to achieve neat opening.
- H. Install stamped steel bridges to fasten flush mounting outlet box between studs.
- I. Install flush mounting box without damaging wall insulation or reducing its effectiveness.
- J. Install adjustable steel channel fasteners for hung ceiling outlet box.
- K. Do not fasten boxes to ceiling support wires or other piping systems.
- L. Support boxes independently of conduit.
- M. Install gang box where more than one device is mounted together. Do not use sectional box.
- N. Install gang box with plaster ring for single device outlets.

3.9 INSTALLATION CONCRETE PULLBOXES AND VAULTS

- A. Install boxes flush with finished grade or surface material.
- B. Install hold down bolts for all covers.
- C. Ground bond steel cover plate with insulated green grounding conductor.
- D. Grout between box and extension(s).
- E. Any box installed in areas of vehicular traffic shall be H20 rated. Contractor shall verify this requirement prior to ordering.

3.10 INTERFACE WITH OTHER PRODUCTS

- A. Install conduit to preserve fire resistance rating of partitions and other elements.
- B. Route conduit through roof openings for piping and ductwork or through suitable roof jack with pitch pocket. Coordinate location with roofing installation.
- C. Locate outlet boxes to allow luminaires positioned as indicated on reflected ceiling plan.
- D. Align adjacent wall mounted outlet boxes for switches, thermostats, and similar devices.

3.11 ADJUSTING

- A. Adjust flush-mounting outlets to make front flush with finished wall material.
- B. Install knockout closures in unused openings in boxes.

3.12 CLEANING

- A. Clean interior of boxes to remove dust, debris, and other material.
- B. Clean exposed surfaces and restore finish.

- END OF SECTION -

PART 1 – GENERAL

1.1 SUMMARY

- A. This section describes the requirements for the cabinets and enclosures for this project.

1.2 REFERENCES

- A. National Electrical Manufacturer's Association (NEMA):
 - 1. NEMA 250; Enclosures for Electrical Equipment.
 - 2. NEMA ICS 1; Industrial Control and Systems.
 - 3. NEMA ICS 4; Terminal Blocks and Industrial use.
 - 4. NEMA ICS 6; Enclosures for Industrial Controls and Systems.
- B. Underwriters Laboratories (UL):
 - 1. UL 50; Enclosures for Electrical Equipment.
 - 2. UL 65; Standards for Wired Cabinets.
 - 3. UL 1059; Terminal Blocks.
 - 4. UL 1773; Termination Boxes.

1.3 SUBMITTALS

- A. Product Data: Submit manufacturer's standard data for enclosures, and terminal cabinets.
- B. Manufacturer's Instructions: Submit application conditions and limitations of use stipulated by product testing agency specified under Regulatory Requirements. Include instructions for storage, handling, protection, examination, preparation, and installation of product.

1.4 QUALITY ASSURANCE

- A. All materials, equipment and parts comprising the units specified herein shall be new, unused, and currently under production.
- B. Only products and applications listed in this Section may be used on the Project unless otherwise submitted.

PART 2 - PRODUCTS

2.1 CABINETS AND ENCLOSURES

- A. Description: Interior Locations: NEMA 1. Exterior locations: NEMA 3R
- B. Construction: Shall be code gauge galvanized steel with standard concentric knockouts for conduit terminations. Size shall be as indicated on Drawings.

CABINETS AND ENCLOSURES
SECTION 26 2716
3595001000

- C. Backboard: Furnish 5/8-inch-thick plywood backboard for mounting terminal blocks. Paint with (3) coats of fire retardant white paint.
- D. Finish: Manufacturer's standard gray baked enamel finish.
- E. Covers: Continuous hinged steel door, lockable and keyed to match panelboard locks. Provide padlock hasp at exterior locations.
- F. Mounting:
 - 1. Flush cabinets shall be furnished with concealed trim clamps and shall be not less than 4 inches deep.
 - 2. Surface cabinets shall be furnished with screw cover trim, flush hinged door and shall not be less than 6 inches deep.

2.2 SIGNAL TERMINAL BACKBOARDS

- A. Furnish cabinet with 3/4-inch fire retardant plywood mounting backboard on interior unless otherwise indicated on Drawings. 8' high x width shown on plans or as required
- B. Finish: Paint with (3) coats of fire-retardant white paint

2.3 TERMINAL BLOCKS AND ACCESSORIES

- A. Terminal blocks: NEMA ICS 4; UL listed.
- B. Power terminals: Unit construction type, closed-back with tubular pressure screw connections, rated 600 volts.
- C. Identification: Identify terminal strips with permanent numbers.
- D. Wiring diagram: Provide wiring diagram in protective pocket on inside front cover of cabinet. Diagram shall indicate control wiring, connections, and layout of components within enclosure.

2.4 HINGED COVER ENCLOSURES

- A. Description: NEMA 250, Type 1 (Interior) and 3R (Exterior) steel enclosure
 - 1. Covers: Continuous hinge, held closed by flush latch operable by key.
 - 2. Furnish interior plywood panel for mounting terminal blocks and electrical components; finish with white enamel.
 - 3. Enclosure Finish: Manufacturer's standard enamel.

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Contractor shall thoroughly examine Project site conditions for acceptance of cabinets and enclosures installation to verify conformance with Manufacturer and Specification tolerances. Do not commence with installation until all conditions are made satisfactory.

3.2 INSTALLATION

- A. Set cabinets and enclosures plumb and symmetrical with building lines. Furnish and install all construction channel bolts, angles, etc. required to mount all equipment furnished under this Section of the Specifications.
- B. Cabinets and enclosures shall be anchored and braced to withstand seismic forces calculated in accordance with that referenced in Section 26 0100: Basic Electrical Requirement.
- C. "Train" interior wiring, bundle and clamp using specified plastic wire wraps.
- D. Install interior cabinets with top of enclosure 6'6" above finished floor.
- E. Install exterior cabinets with top of enclosure 6'6" above finished grade.
- F. Replace doors or trim exhibiting dents, bends, warps or poor fit that may impede ready access, security or integrity.
- G. Terminate conduit in cabinet with lock nut and grounding bushing.
- H. Terminate wiring on terminal blocks and identify each with heat shrink tags.

3.3 CLEANING

- A. Touch up scratched or marred surfaces to match original finish.
- B. Clean electrical parts to remove conductive and harmful materials.
- C. Remove dirt and debris from enclosure.
- D. Clean existing panelboards and load centers to remain or to be reinstalled.

- END OF SECTION -

PART 1— GENERAL

1.1 SUMMARY

- A. Section Includes
 - 1. This section describes the requirements for the circuit protective devices for this project.

1.2 REFERENCES

- A. Federal Specification (FS):
 - 1. FS W-C-375; Circuit Breakers, Molded Case, Branch Circuit and Service.
 - 2. FS W-F-870; Fuseholders (for Plug and Enclosed Cartridge Fuses).
- B. Underwriters Laboratories, Inc. (UL):
 - 1. UL 248(1-16); Low-Voltage Fuses.
 - 2. UL 489; Molded-Case Circuit Breakers, Molded-Case Switches and Circuit Breaker Enclosures.
 - 3. UL 512; Fuseholders.
 - 4. UL 1066; Low Voltage AC and DC Power Circuit Breakers Used in Enclosures.
- C. National Electrical Manufacturer Association (NEMA):
 - 1. NEMA AB 1; Molded Case Circuit Breakers.

1.3 SUBMITTALS

- A. Product Data
- B. Operation and Maintenance (O&M) Manuals

1.4 QUALITY ASSURANCE

- A. All materials, equipment and parts comprising the units specified herein shall be new, unused, and currently under production.
- B. Only products and applications listed in this Section may be used on the Project unless otherwise submitted.

1.5 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Delivery: Overcurrent Protective Device components shall not be delivered to the Project site until protected storage space is available. Storage outdoors covered by rainproof material is not acceptable. Equipment damaged during shipment shall be replaced and returned to Manufacturer at no cost to Owner.

CIRCUIT PROTECTIVE DEVICES

SECTION 26 2800

3595001000

- B. Storage: Store in a clean, dry, ventilated space free from temperature extremes. Maintain factory wrapping or provide a heavy canvas/plastic cover to protect units from dirt, water, construction debris and traffic. Provide heat where required to prevent condensation.
- C. Handling: Handle in accordance with Manufacturer's written instructions. Be careful to prevent internal component damage, breakage, denting and scoring. Damaged units shall not be installed. Replace damaged units and return equipment to Manufacturer.

PART 2 - PRODUCTS

2.1 FUSES

- A. General: All power fuses shall be time-delay, high interrupting (300 K AIC), current limiting type, unless otherwise noted on the Drawings. All fuses shall be the product of a single Manufacturer and shall be selectively coordinated when applied in 2:1 ratios. Types of fuses shall be as follows:
 - 1. 0 - 600 amperes: UL Class J, dual element, time delay type fuse with separate overload and short-circuit elements. The fuse shall hold 500% of rated current for a minimum of 10 seconds.
 - 2. 601 - 4000 amperes: UL Class L, time delay type fuses with 99.9% pure silver fuse links and "O-rings" to seal between the end bells and the fuse barrel. Fuses shall hold 500% of rated current for a minimum of 4 seconds, clear 20 times rated current in 0.01 seconds or less.
 - 3. Motor branch circuit fuses (0-600 amperes): UL Class J dual element, time delay type fuse. Motor branch circuit fuses shall be sized for Type 2 coordination for the motor controller and back-up motor overload protection and shall be coordinated with motor starter overload relay heaters.
- B. Control and instrument fuses shall be suitable for installing in blocks or fuse holders. Exact type and rating shall be as recommended by the Manufacturer of the equipment being protected.
- C. Fuses for installation in current limiting circuit breakers or motor circuit protectors shall meet the specific requirements of the Manufacturers of that equipment to ensure compatibility.

2.2 MOLDED CASE CIRCUIT BREAKERS

- A. Unless noted otherwise, circuit breakers shall be molded case, bolt on and trip indicating.
- B. Where stationary molded case circuit breakers are indicated on the Drawings to be current limiting type, they shall be current limiting as defined by UL 489 and shall not employ any fusible elements.
- C. Circuit breakers shall have interrupting capacity not less than that indicated on the Drawings or if not indicated, not less than 25,000 RMS symmetrical amps for 480

volt systems and 10,000 RMS symmetrical amps for 208 volt systems.

- D. Covers shall be sealed on non-interchangeable breakers and trip unit covers shall be sealed on interchangeable trip breakers to prevent tampering. Circuit breaker ratings shall be clearly visible after installation or engraved nameplates shall be provided stating the rating. All ferrous parts shall be plated to minimize corrosion.
- E. Circuit breakers shall be toggle, quick-make and quick-break operating mechanisms with trip-free feature to prevent contacts being held closed against overcurrent conditions in the circuit. Trip position of the breakers shall be clearly indicated by operating handles moving to a center position.
- F. Multipole breakers shall have a single handle to open and close all contacts simultaneously in both manual operation and under automatic tripping. Interpole barriers shall be provided inside the breaker to prevent any phase-to-phase flashover. Each pole of the breaker shall have means for Arc extinguishing.
- G. All terminals shall be rated for aluminum or copper wire.
- H. Unless noted otherwise, circuit breakers with trip ratings 400 amp and smaller shall be ambient temperature compensated, thermal magnetic type unless otherwise noted. Breakers shall be of full size, 1" per pole type. Panels with more than one branch breaker larger than 100 amps shall be installed in distribution type panels.
- I. Accessories: Provide accessories as noted on the Drawings, i.e. shunt-trip, auxiliary contacts, undervoltage trip, alarm switch, etc.
- J. Spaces in the boards shall be able to accept any combination of 1, 2 or 3 pole circuit breakers as indicated. Provide all necessary bus, device supports and mounting hardware sized for frame, not trip rating.
- K. Series rated breakers are not acceptable unless specifically noted on the Drawings.

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Contractor shall thoroughly examine Project site conditions for acceptance of cabinets and enclosures installation to verify conformance with Manufacturer and Specification tolerances. Do not commence with installation until all conditions are made satisfactory.

3.2 INSTALLATION

- A. Install overcurrent protective devices in accordance with Manufacturer's written instructions, as indicated on the Drawings and as specified herein.
- B. Tighten electrical connectors and terminals; including screws and bolts, in accordance with equipment Manufacturers published torque-tightening values for

CIRCUIT PROTECTIVE DEVICES
SECTION 26 2800
3595001000

equipment connectors. Where Manufacturers torque requirements are not indicated tighten connectors and terminals to comply with tightening torque specified in UL Standard 486A.

- C. Install overcurrent protective devices and accessories in accordance with Manufacturer's written instructions and with recognized industry practices to ensure that protective devices comply with requirements. All devices shall be installed in accordance with applicable CEC and NEMA standards for installation.
- D. Circuit breakers serving "Fire Alarm Control Panel(s)" shall be red in color.

3.3 FIELD QUALITY CONTROL

- A. The Contractor shall supply a suitable and stable source of electrical power to each test site.
- B. Testing of overcurrent protective devices shall be done only after all devices are installed and system is energized.
- C. Prefunctional testing:
 - 1. Visual and mechanical inspection:
 - a. Inspect for physical damage, defects alignment and fit.
 - b. Perform mechanical operational tests in accordance with Manufacturer's instructions.
 - c. Compare nameplate information and connections to Contract Documents.
 - d. Check tightness of all control and power connections.
 - e. Check that all covers, barriers and doors are secure.
 - 2. Electrical tests:
 - a. Circuit continuity: All feeders shall be tested for continuity. All neutrals shall be tested for improper grounds.
 - b. Determine that circuit breaker will trip under overcurrent condition, with tripping time in conformance with NEMA AB 1 requirements.
 - c. Test all circuit breakers with frame size 225 amps and larger and 10 percent of all circuit breakers with frame sizes less than 225 amps in each panelboard, distribution board, switchboard, etc. unless otherwise noted.
- D. Contractor shall replace at no costs to the Owner all devices which are found defective or do not operate within factory specified tolerances.
- E. Contractor shall submit the final test report for review prior to Project closeout and final acceptance by the Owner. Test report shall indicate test dates, devices tested, results, observation, deficiencies and remedies. Test report shall be included in the operation and maintenance manuals.

3.4 ADJUSTING

CIRCUIT PROTECTIVE DEVICES
SECTION 26 2800
3595001000

- A. Adjust circuit breaker trip settings for coordination with other overcurrent protective devices in system.
- B. Adjust circuit breaker trip settings for adequate protection from overcurrent and fault currents.

3.5 CLEANING

- A. Upon completion of Project prior to final acceptance the Contractor shall thoroughly clean overcurrent protective devices per Manufacturer's approved methods and materials. Remove paint splatters and other spots, dirt and debris.

- END OF SECTION -

PART 1 - GENERAL

1.1 SUMMARY

- A. This section describes the basic requirements for the fire alarm system work on this project.

1.2 REFERENCES AND STANDARDS

- A. California Fire Code (CFC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. American National Standards Institute, Inc. (ANSI): ANSI C62.41
- C. National Fire Protection Association (NFPA): 72, 101
- D. Underwriter Laboratories, Inc. (UL)
 - 1. UL 38; Manual Signaling Boxes Fire Alarm Systems.
 - 2. UL 268; Smoke Detectors for Fire Alarm Signaling Systems.
 - 3. UL 268 A; Smoke Detectors for Duct Application.
 - 4. UL 464; Audible Signal Appliances.
 - 5. UL 497B; Protectors for Data Communications and Fire Alarm Circuits.
 - 6. UL 521; Heat Detectors for Fire Protective Signaling Systems.
 - 7. UL 864; Control Units and Accessories for Fire Alarm Systems.
 - 8. UL 1424; Cables for Power-Limited Fire-Alarm Circuits.
 - 9. UL 1480; Speakers for Fire Alarm, Emergency and Commercial and Professional Use.
 - 10. UL 1481; Power Supplies for Fire-Protective Signaling Systems.
 - 11. UL 1638 Visual Signaling Appliances Standard.
 - 12. UL 1711; Amplifiers for Fire Protective Signaling Systems.
 - 13. UL 1971 Signal Devices for Hearing Impaired.
- E. International Engineering Consortium (IEC): IEC 60849
- F. Factory Mutual System (FM) approval guide: FM P7825

1.3 SUBMITTALS

- A. Product Data
- B. Operation and Maintenance (O&M) Manuals
- C. Field Test Reports

**FIRE ALARM SYSTEM
SECTION 26 6116
3595001000**

1.4 QUALITY ASSURANCE

- A. All materials, equipment and parts comprising the units specified herein shall be new, unused, and currently under production.
- B. Only products and applications listed in this Section and in the Electrical Drawings may be used on the Project unless otherwise submitted.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Products furnished by the Manufacturers indicated in the Electrical Drawings and this section shall be acceptable if in compliance with all features specified herein
 - 1. Gamewell-FCI
 - 2. Cooper Wheelock

2.2 CONDUIT AND WIRE

- A. Conduit:
 - 1. Conduit shall be in accordance with the California Electrical Code (CEC).
 - 2. Where required, all wiring shall be installed in conduit. Conduit fill shall not exceed 40 percent of interior cross-sectional area where three or more cables are contained within a single conduit.
 - 3. Cable must be separated from any open conductors of power, or Class 1 circuits, and shall not be placed in any conduit, junction box or raceway containing these conductors, per CEC Article 760-29.
 - 4. Wiring for 24-volt DC control, alarm notification, emergency communication and similar power-limited auxiliary functions may be run in the same conduit as initiating and signaling line circuits. All circuits shall be provided with transient suppression devices and the system shall be designed to permit simultaneous operation of all circuits without interference or loss of signals.
 - 5. Conduit shall not enter the fire alarm control panel or any other remotely mounted control panel equipment or back boxes, except where conduit entry is specified by the Life Safety Control Panel (LSCP) manufacturer.
 - 6. Connectors shall be compression type fittings to join EMT to a box or enclosure and to couple two ends of EMT conduit. Fittings shall be: Zinc plated, steel UL listed concrete tight, and threadless where connecting to conduit. Male hub threads -NPSM (American National Standard Pipe Straight Mechanical) where connecting to box or cabinet with steel locknuts.
- B. Wire:
 - 1. Wiring shall be in accordance with state and national codes (e.g., CEC Article 760) and as recommended by the manufacturer of the fire alarm system. Number and size of conductors shall be as recommended by the fire alarm system manufacturer, but not less than 18 AWG (1.02 mm) for Initiating Device Circuits

and Signaling Line Circuits, and 14 AWG (1.63 mm) for Notification Appliance Circuits.

2. All wire and cable shall be listed and/or approved by a recognized testing agency for use with a protective signaling system.
 3. Wire and cable shall be installed in conduit or metal surface raceway when in exposed spaces. Minimum size of conduit shall be 3/4" inch. Utilize Wiremold 700 series surface raceway (in lieu of conduit) for area where conduit cannot be installed concealed. Cable above accessible ceiling can be installed free air when using applicable cable. Support all free air cable every 48" with j-hooks.
 4. All field wiring (with exception of external communications Ethernet) shall be electrically supervised for open circuit and ground fault.
 5. The LSCP shall be capable of T-tapping NFPA Style 4 (Class B) Signaling Line Circuits (SLCs). Systems which do not allow or have restrictions in, for example, the number of T-taps, length of T-taps etc., is not acceptable.
- C. Terminal Boxes, Junction Boxes and Cabinets: All boxes and cabinets shall be UL listed for their use and purpose.
- D. The fire alarm control panel shall be connected to a separate dedicated branch circuit, maximum 20 amperes. This circuit shall be labeled at the main power distribution panel as FIRE ALARM. LSCP primary power wiring shall be 12 AWG. The control panel cabinet shall be grounded securely to either a cold water pipe or grounding rod. The control panel enclosure shall feature a quick removal chassis to facilitate rapid replacement of the LSCP electronics.

2.3 FIRE ALARM DEVICES

- A. Initiation: See Component Schedule in the Electrical Drawings for details
1. Monitor Module
 2. Heat Detector
 3. Smoke Detector
- B. Notification: See Component Schedule in the Electrical Drawings for details
1. Strobe
 2. Combination Speaker-Strobe
 3. Sync Module

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Contractor shall thoroughly examine Project site conditions for acceptance of cabinets and enclosures installation to verify conformance with Manufacturer and Specification tolerances. Do not commence with installation until all conditions are made satisfactory.

FIRE ALARM SYSTEM
SECTION 26 6116
3595001000

3.2 INSTALLATION

A. General:

1. The 120/208-volt, 3 wire, 60 cycles AC emergency power supply required to power the system. Connect to red colored circuit breaker(s) in panel board. Identify circuit as "Fire Alarm Circuit Control".

B. Wiring:

1. Individual input and output device addressability as well as remote sensitivity measurement, supervision and power shall all be performed on the same pair of wires. Wiring shall be Class B.
2. Each Class B initiating circuit shall consist of a two (2)-wire circuit. allowing a maximum of 20 T-taps and not requiring any end-of-line device for supervision. Each initiating circuit shall accommodate up to 75% of the manufacturers maximum addressable programmable initiating devices, to allow for future expansion.
3. Wiring for shielding certain conductors from others or routing in separate raceways, shall be as recommended by the Manufacturer's current requirements.
4. All wiring shall be installed in a continuous steel conduit or metal surface raceway when in exposed spaces. All conduit fittings shall be steel compression. Conduit shall be of the size recommended by the equipment Supplier with a minimum of 3/4" inch.
5. Wire color-coding shall remain the same throughout the system.
6. No wiring other than that directly associated with life safety/fire alarm detection, alarms, or auxiliary fire protection functions (no 120 VAC), shall be permitted in life safety/fire alarm conduits.
7. Make conduit and wiring connections to sprinkler flow switches, PIV's, sprinkler valve monitors, door hold-open/closure devices, smoke management fans, smoke dampers, elevator controller, emergency generator, etc.
8. All wiring shall be checked and tested to ensure that there are no grounds, opens or shorts.
9. All life safety/fire alarm junction boxes shall be color-coded and marked
10. Wire nut splices are not allowed.
11. Wires shall be numbered at each connection, termination, and junction point. Wire numbering tags shall be Brady Perma-Code, Westline or equal wire markers. Each group of wires shall be tagged with its destination at each panel, terminal box or junction box.
12. All wire used on the life safety/fire alarm and communication system shall have a minimum insulation rating of 105 degrees C. Bell wire or thermostat wire is not acceptable.

3.3 FIELD QUALITY CONTROL

A. Pre-functional testing: Visual and mechanical inspection

1. Inspect for physical damage, defects alignment and fit.

2. Perform mechanical operational tests in accordance with Manufacturer's instructions.
3. Compare nameplate information and connections to Contract Documents.
4. Check tightness of all control and power connections.
5. Check that all covers, barriers and doors are secure.
6. Visually check all sampling pipes to ensure that all joints, fittings, bends, sampling points, etc., comply with the Specification.
7. Check the air sampling system to ensure the following features are operational and programmed in accordance with the specification.
 - a. Alarm threshold levels
 - b. Pipes in use
 - c. Detector address
 - d. Clock and date
 - e. Time delays
 - f. Air flow fault thresholds
 - g. Display buttons operable
 - h. Check to ensure that all ancillary warning devices operate as specified.
 - i. Check interconnection with LSCP to ensure correct operation.

B. Pre-functional testing: Electrical tests

1. The system shall be completely tested prior to final acceptance testing. All points shall be tested from point of initiation to the final point or points of annunciation. All circuits shall be tested for continuity and ability to transmit the required signal correctly to the LSCP. Any problem due to wrong wire type, wire twist, impedance, mismatches, noise filtering or shielding shall be completely corrected during pretesting and prior to any final acceptance tests.
2. Testing shall include each and every device in the system. Coordinate with other trades as necessary for testing.
3. Tamper switches: Verify "trouble" signal is received and alarmed on closing of each valve.
4. Smoke detectors and duct smoke detectors: Test with actual or approved artificial smoke. Verify that reset does not occur when devices are cleared of smoke. Verify supervisory circuit function. Perform pressure differential test on all duct-mounted smoke detectors.
5. Intelligibility testing shall be per IEC 60849 and verified and tested by a third-party testing organization.
6. Central station notification: Verify that one set of conductors in the terminal cabinet becomes a short circuit on any "trouble" condition and that the other set becomes a short circuit on any "alarm" condition. Verify that the conductor groups are labeled properly.

C. Contractor shall replace at no costs to the Owner all devices which are found defective or do not operate within factory specified tolerances.

**FIRE ALARM SYSTEM
SECTION 26 6116
3595001000**

END OF SECTION

PART 1 - GENERAL REQUIREMENTS

1.1 OVERVIEW

- A. Copper cabling will be Panduit with a 25 year Pan-Net warranty.
 - 1. At project completion, the contractor shall present to owner a single project binder with electronic and hard copies of test results, as built drawings, pictures, bill of materials listing part numbers, etc. and a Visio 2007 drawing electronic provided to owner's Information Services and Educational Technology (ISET) office which identifies all Data jack locations and port assigned numbers.
- B. The installing contractor shall furnish and install all hardware, cables, devices, and other materials even though not specifically mentioned herein, which are necessary for the proper integration of the system so that the system shall perform the functions listed herein in compliance with all specified requirements.
- C. A Contractor may use up to ONE sub-contractor to install all CAT6 data cabling. Contractor will provide 'As Builts' and warranty information to ISET department.
 - 1. The contractor shall have a minimum of five years professional field experience pulling/terminating fiber and Cat6 cable.
 - 2. The contractor shall possess a valid C-7 California State contractor's license. This license shall have been issued two (2) years prior to the date of the bid. No other license classification is acceptable.
 - 3. The contractor and/or sub-contractors shall have Panduit Certified Installers as well as Corning Certified NPI Installers.
- D. The contractor and/or sub-contractors shall have at least half BICSI installers and one RCDD who will work on the project.
 - 1. The contractor shall provide a twenty-five (25) year application performance warranty for all Panduit Pan-Net copper cable and connectivity products. The system shall be installed to meet all TIA/EIA commercial building wiring standards and installed per appropriate Panduit instruction sheets. If any Panduit product fails to perform as stated above, Panduit will provide new components at no charge.

1.2 ABBREVIATIONS

- A. A.P. - Wireless Access Point
- B. AFF - Above the finished floor
- C. BKBRD - Backboard
- D. E.F. - Entrance Facility (formerly called MPOE or MPOP)

DATA COMMUNICATIONS
SECTION 27 1000
3595001000

- E. E.R. - Equipment Room. A building/campus serving facility connecting backbone to horizontal cabling and housing the building/campus' core system equipment.
- F. IDF – Intermediate Distribution Facility
- G. ISP - Inside Plant
- H. MAC - Moves, Adds, and Changes
- I. MDF – Main Distribution Facility
- J. MM - Multimode fiber
- K. NEXT - Near End Crosstalk
- L. OSP - Outside Plant
- M. SM - Single mode fiber
- N. T.R./T.E. - Telecommunications Room/Enclosure. A floor serving facility connecting backbone and E.R. to horizontal cabling in a region on each floor.
- O. TBB - Telecommunications Bonding Backbone
- P. TGB - Telecommunications Ground Buss Bar
- Q. TMGB - Telecommunications Main Ground Buss Bar
- R. U.O.N. - Unless otherwise noted

1.3 RELATED DOCUMENTS

- A. In addition to these specifications, the contractor shall reference the following drawings and documents:
 - 1. Architectural / Engineer drawings
 - 2. Detail Visio 2007 As Built Drawings and Diagrams.
 - 3. Any addendum, hereafter release of specifications
 - 4. Panduit Pan-Net 25 year Warranty
- B. Contractor shall ensure that, manufacture, ANSI/TIA/EIA-586-B cable testing, and install of the telecommunications cabling network is per manufacturer's requirements and in accordance with NFPA-70 (National Electrical Code®), state codes, local codes, requirements of authorities having jurisdiction, and particularly the following standards:
 - 1. ANSI/TIA/EIA-568-B.1 - Commercial Building Telecommunications Cabling Standard, Part 1: General Requirements
 - 2. ANSI/TIA/EIA-568-B.2 - Commercial Building Telecommunications Cabling Standard, Part 2: Balanced Twisted Pair Cabling Components
 - 3. ANSI/TIA/EIA-568-B.3 - Optical Fiber Cabling Components Standard

4. ANSI/TIA/EIA-569-A - Commercial Building Standard for Telecommunications Pathways and Spaces
 5. ANSI/TIA/EIA-606(A) - The Administration Standard for the Telecommunications Infrastructure of Commercial Buildings
 6. ANSI/TIA/EIA-607(A) - Commercial Building Grounding and Bonding Requirements for Telecommunications
 7. ANSI/TIA/EIA-758(A) Customer-Owned Outside Plant Telecommunications Cabling Standard
 8. ISO/IEC 11801:2002 ed 2- International standard for Class F (Cat7)
 9. IEC 61076-3-104:2002- International standard for RJ quad jack
 10. ISO/IEC CD14165-114 - International standard for duplex gigabit on two pair Ethernet
 11. TIA TSB 155 - 10G Ethernet over existing Cat6 up to 50 meters
 12. ANSI/TIA/EIA 565.B.2,10 - Standard for Cat6
 13. Cal/OSHA-Pocket Guide for the Construction Industry (recent edition)
- C. Contractor shall install cabling in accordance with the most recent edition of BICSI publications:
1. BICSI - Telecommunications Distribution Methods Manual (TDMM)
 2. BICSI - Cabling Installation Manual
 3. BICSI - Customer-Owned Outside Plant Design Manual
- D. Federal, state, and local codes, rules, regulations, and ordinances governing the work, are as fully part of the specifications as if herein repeated or hereto attached. If the contractor shall note items in the drawings or the specifications, construction of which would be code violations, promptly call them to the attention of the owner's representative in writing. Where the requirements of other sections of the specifications are more stringent than applicable codes, rules, regulations, and ordinances, the specifications shall apply.

1.4 PRE-INSTALLATION MEETING

- A. Schedule a meeting a minimum of five calendar days prior to beginning work.
- B. Agenda: Clarify questions related to work to be performed, scheduling, coordination, labeling for data jacks, data jack layout on telco racks in MDF and IDFs, etc.
- C. Attendance: Communications systems installer, general contractor, architects representatives, and other parties affected by work.
- D. A copy of manufacturer warranty application shall be provided at this meeting.

1.5 WARRANTY

- A. The project shall be pre-registered with manufacturer before installation has begun.
- B. The installation will have to pass scan tests by a certified contractor.

DATA COMMUNICATIONS
SECTION 27 1000
3595001000

- C. The installation will have to be documented with labels and drawings.
- D. A 25-year PAN-NET manufacturer warranty covering all components, equipment and workmanship shall be passed through in writing with system documentation. The warranty period shall begin on the system's first use by the owner.

1.6 APPROVED PARTS LIST

The following is an approved parts list:

Wire Management

Manufacturer	Part Number	Description
Panduit		J-Hooks shall be Panduit
Panduit	WMP1E	2U Horizontal Wire management
Panduit	WMPSE	1U Horizontal Wire Management
Panduit	CLT100F-C3	1" Split Loom Tubing Orange
Panduit	CLT188F-X3	1.88" Split Loom Tubing Orange
		1" Fiber Innerduct
		2" Fiber Innerduct
Panduit	CWF400N	4" Conduit Waterfalls
Panduit	CCMKIT1	Cable Management Kit
Panduit	WMPVHC45E	Vertical Cable Manager Front & Rear
Panduit	NCMH2	2U Horizontal Cable Manager Front & Rear
Trilobular		Taptite II thread

Twisted Pair Products

Manufacturer	Part Number	Description
Panduit	PUR6004BU-U	Cat 6 Riser Blue
Panduit	PUR6004WH-U	Cat 6 Riser White
Panduit	PUR6004OR-U	Cat 6 Riser Orange
Panduit	PUR6004RD-U	Cat 6 Riser Red
Panduit	PUR6004YL-U	Cat 6 Riser Yellow
Panduit	PUR6004VL-U	Cat 6 Riser Violet
Panduit	PUP6004BU-U	Cat6 Plenum Blue
Panduit	PUP6004WH-U	Cat6 Plenum White
Panduit	PUP6004OR-U	Cat6 Plenum Orange
Panduit	PUP6004RD-U	Cat6 Plenum Red
Panduit	PUP6004YL-U	Cat6 Plenum Yellow
Panduit	PUP6004VL-U	Cat6 Plenum Violet
General Cable	7136100	Outside Plant Cat 6
Panduit	CFPE1WHY	1 Port White Faceplate
Panduit	CFPE2WHY	2 Port White Faceplate
Panduit	CFPE4WHY	4 Port White Faceplate
Panduit	CFPE6WHY	6 Port White Faceplate
Panduit	CFP2SY	Stainless Steel 2 Port Faceplate
Panduit	CJ688TGWH	Cat 6 Jack White
Panduit	CJ688TGOR	Cat 6 Jack Orange
Panduit	CJ699TGYL	Cat 6 Jack Yellow
Panduit	CJ688TGBL	Cat 6 Jack Blue
Panduit	CJ688TGVV	Cat 6 Jack Violet
Panduit	CJ688TGRD	Cat 6 Jack Red

DATA COMMUNICATIONS
SECTION 27 1000
3595001000

Panduit	CPPL24WBLY	Blank, Minicom, 24 port patch panel
Panduit	CPPL48WBLY	Blank, Minicom, 48 Port Patch Panel
Panduit	SRBWCY	Strain Relief for Patch Panel
Panduit	PSL-DCJB	Black out Module Red (Need White, Red Listed)
Panduit	PSL-DCJB-IW	Black out Module White
Panduit	PSL-DCJB	Black out Module
Panduit	C4PPLK	Replacement Label Kit
Panduit	UTPSP3RD	3 Foot Cat 6 Red Patch Cord
Panduit	UTPSP5RD	5 Foot Cat 6 Red Patch Cord
Panduit	UTPSP3OR	3 Foot Cat 6 Orange Patch Cord
Panduit	UTPSP6OR	5 Foot Cat 6 Orange Patch Cord

Raceway

<u>Manufacturer</u>	<u>Part Number</u>	<u>Description</u>
Panduit	LD3WH6-A	LD3 Raceway (Substitute 6 with 8 and 10, for Longer Lengths)
Panduit	LD5WH6-A	LD5 Raceway (Substitute 6 with 8 and 10, for Longer Lengths)
Panduit	LD10WH6-A	LD10 Raceway (Substitute 6 with 8 and 10, for Longer Lengths)
Panduit	CFXWH-E	Raceway Coupler (Replace 'X' with 3, 5, or 10 for the different size raceway)
Panduit	RAFXWH-E	Right Angle Fitting (Replace 'X' with 3, 5, or 10 for the different size raceway)
Panduit	ICFXWH-E	Inside Corner Fitting (Replace 'X' with 3, 5, or 10 for the different size raceway)
Panduit	OCFXWH-E	Outside Corner Fitting (Replace 'X' with 3, 5, or 10 for the different size raceway)
Panduit	DCFXWH-E	Drop Ceiling Fitting (Replace 'X' with 3, 5, or 10 for the different size raceway)
Panduit	JBX3510WH-A	Single Gang Outlet for LD Raceway

Tools

<u>Manufacturer</u>	<u>Part Number</u>	<u>Description</u>
Panduit	CGJT	
Panduit	EGJT	
Panduit	CWST	
Panduit	CJAST	
Panduit	TTS-20R0	Tak Tape Rolls
Panduit	HLS-75R0	Bulk Velcro

DATA COMMUNICATIONS
SECTION 27 1000
3595001000

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. The acceptable manufacturer for the cabling connectivity is Panduit/General copper or Panduit/Panduit copper.
- B. Part listed are the owner's standards and any substitutions shall be approved in writing through submittal.
- C. Panduit 25 year Pan-Net.
- D. Corning Cable

2.2 QUANTITIES

- A. Distances mentioned and shown on drawings or spreadsheets are approximate. Field verification shall be made prior to install.
- B. Quantities listed here and in "parts list" document take precedence over drawing quantities.

2.3 SYSTEM COMPONENTS

- A. Materials provided shall meet or exceed the standards/description listed below.
- B. Fiber Trunk Cable
 - 1. Corning 12 strand single mode outdoor riser fiber optic cable
- C. Horizontal Cable (Cat6):
 - 1. Solid copper, 24 AWG, 100 balanced twisted-pair (UTP) Category 6 cables with four individually twisted-pairs, which meet or exceed the mechanical and transmission performance specifications in ANSI/TIA/EIA-568-B.2 to 250 MHz. General Cables Genspeed 6000 Enhanced CAT6E meets the specification.
 - 2. Use plenum rated cable in PLENUM air environments only.
 - 3. Use gel-filled or other outdoor plant cables in OSP environments as under slab concrete, outside near water, etc.
- D. Connectors (Cat6):
 - 1. 8-pin modular, category 6, pinned to T5689B standard.
- E. Faceplates:
 - 1. Provide 1, 2, 4 or 6 port faceplates and use classic style with label window. Fill unused ports with blank inserts.
- F. Patch Frames:

1. Data frame is to be 19" rack mountable, 24 or 48 empty ports for 8-pin modular jacks. Panels shall include a window for labels. Note: unused ports are to be filled in with black blank inserts.

G. Wire management:

1. On racks the horizontal cable managers shall be Panduit center mounting brackets (WMPF1E) for the wire managers in front for easy access during MACs. Horizontal managers shall be a minimum 1 RU.
2. Vertical cable managers (WMPVHC45E) are to be same height as rack. With fingers in the rear and in the front. They shall to have a bend radius control or strain relief clips. Panduit vertical managers are to be used for extra capacity.
3. Cable runway shall be ladder style or mesh /solid cable tray with a 12" width and 4" depth. The runway shall be mounted to a support loading wall as well as supported to the rack. An angle transition shall be used for adjoining runways or 90 degree bends. A cable drop shall be used to protect cables transitioning from runway to point of termination. If using a ladder style, use cable fingers attached to the sides to prevent spilling of cable over the sides.

H. Cable Pathways:

1. J-hooks will be used for suspending cables. These hooks shall have a 50 cable capacity and optional mounting. Preferred hooks have a wheel attachment capability so cables will not be dragged across during installation. Ensure that bends and edges will not pinch or cut cable sheath. Provide enough J-hooks to keep pathway along walls, J-hooks shall not cross the room.
2. Penetrations through fire rated walls shall utilize a metallic assembly with fire stop built into the assembly. EZ Path mechanical fire stop by Specified Technologies meets this requirement and shall be used. There is no exception to this.

I. Miscellaneous:

1. Cable ties shall be Velcro with a loop strap. Nylon cable ties shall not be used. If they are they shall be black and strapped with a loose tie so as not to pinch the cable sheath and with enough slack to get snips and fingers between tie and cable. The end of the tie shall be cut off after strapping.
2. Labels for patch panels, faceplates, and cables shall be by one manufacturer. Ex: Label Ware, EasyMark, Brady, LabelMo, etc.
3. All conduits shall have a maximum fill ratio of 60%.
4. All labels including the cable label shall be laser printed.
5. Labeling (Wire and Wall Jacks): All Labeling shall follow the "Tracy U.S.D. Labeling Format" (See "Tracy U.S.D. Labeling Format" Spreadsheet) with exception of workstation cables (i.e. patch cords). Hand written labels are not acceptable. All labels shall be machine printed black lettering on opaque white tape, stenciled onto adhesive labels, or type written onto adhesive labels. The font shall be at least one-eighth inch (1/8") in height, block characters, and legible. Patch panels shall be assembled and terminated in a sequential order, exhibiting room and workstation numbers for all workstations served by the MDF or IDF.

DATA COMMUNICATIONS
SECTION 27 1000
3595001000

6. Each fiber optics cable segment shall be labeled at each end with its respective IDF identifier. Each fiber interconnect device shall be labeled with its respective IDF identifier.
7. Each telecommunication outlet shall be labeled with its respective workstation number respective (machine labels only).
8. Workstation Terminal Outlets are to be installed within single-gang or double-gang electrical boxes. No mud-rings are to be used. WAO faceplates are to have labeling which identifies connected IDF.
9. Each copper backbone cable shall be machine labeled and printed EIA/TIA-606 Section 8 compliant only at each end with its respective IDF number/letter. Each binder group shall be tied off with its respective identifying ribbon at each breakout point.
10. Labeling will be completed before testing shall begin; discrepancies during inspection with the labeling will void all test results.

2.4 PROJECTOR

1. Contractor shall furnish and install Epson Brightlink 1485Fi and associated Epson Pilot control pad.

PART 3 - EXECUTION

3.1 SYSTEM SPECIFIC INSTRUCTIONS

A. Horizontal Cable:

1. Contractor shall label cables in 2 locations 12" apart.
2. Contractor is to terminate using the 568B pin out.
3. Contractor is to leave 10 feet of slack for all cables at the station in the accessible ceiling.
4. All cables will terminate at the stations with RJ45 connectors and shall be housed in a faceplate. If the connector is in the ceiling or behind a faceplate (such as the AV control panel) the connector shall be installed in a surface housing.

B. Closet/Rack:

1. All cables will terminate on the rack on a modular patch panel with an RJ45 connector.
2. A horizontal manager shall be installed above and below every 48 ports of patch panels (CPPL48WBLY) and switches.
3. A service coil shall be created above the rack on the wall of the closet. Do not place a service coil within the vertical and horizontal wire management. Cables within those managers shall be kept straight with proper bend radius.
4. The service coil shall be long enough to reach the farthest corner of the room and then down to the floor.
5. Patch frames shall be rack mounted using grounding screws and washers.

6. Note: unused ports on the patch frames are to be filled in with black blank inserts. Also, 1-2 blanks will be installed after each student data, teacher, admin, ceiling, and paging outlet with less than 4 cables to allow for future MACs.
7. Contractor shall place a drawing next to the data rack showing a floor plan with outlet locations and labels that match the rack labels. These drawings are to be laminated or in a plastic casing.

3.2 INSTALLATION PROCEDURES

- A. The following are installation practices that ensure superior performance and aesthetics.
- B. NOTE: References to conduit, raceway and electrical are for contractor's information. Actual installation of these components is included in another specification. If contractor notices a difference between actual install and the specs below, the contractor shall bring that immediately to the attention of the electrical engineer.
- C. Work Area Outlet
 1. The 10 ft coil shall not be a traditional service loop. Rather, the cable shall be extended along the wall then brought back at a lower height.
 2. A pull string for MACs shall be pulled with cable into accessible ceiling space or length of conduit. *Label strings to indicate destination of conduit.*
 3. Fill and label faceplates starting in the top left then moving right and downward.
 4. In addition to labeling, jacks shall be quickly identifiable by the following color:
 - a. Paging Jack Blue
 5. All jacks are to be terminated using 568B pin assignment.
 6. Minimize the amount of untwisting in a pair as a result of termination to connecting hardware. The amount of twisting shall not exceed 1/2" for category 6 and higher cables. Cable sheath shall touch the back of jack after termination (leave no portion of the cable exposed).
 7. A classic series faceplate (or surface mount box if needed) with a label window shall be used or the Jack itself labeled (Easy Mark #PLL-46-Y3C-1 or equal).
 8. The cable behind the faceplate shall also be labeled to match faceplate.
 9. ALL labels are to be machine generated, laminated, and adhesive.
 10. Each faceplate shall be labeled with its respective workstation number.
- D. Cable Pathways
 1. Acceptable Pathways:
 - a. All horizontal cable shall have support, the cable shall never be lain freely and resting on structural supports nor shall they use ceiling grid or lighting support wires.
 - b. The pathway to the work area shall allow for a minimum of 3 cable runs per individual work area.
 - c. Pathways shall ensure that a maximum pulling tension 25 lb-f is not exceeded and pathways (or installers) shall not deform the cable jacket. *If cable becomes kinked, contractor shall replace the cable.*

DATA COMMUNICATIONS
SECTION 27 1000
3595001000

- d. Acceptable pathways are: cable tray, j-hooks, conduit, and surface mount raceway. No floor mounted boxes.
- 2. J-hooks - responsibility of cable installer
 - a. Cables shall not be attached to ceiling grid or lighting support wires. Instead cable pathway shall be along walls. Cables shall never cross a room. The pathway shall always be along a wall. This makes for easier MAC as any tile next to a wall can be moved to access.
 - b. For large quantities of cables (50 to 75) that converge at the TR and other areas, provide cables trays that are specifically designed to support the required cable weight and volume. When more than 50 cables are in a pathway j-hooks shall not be used or a second pathway shall be created. (NOTE: It is recommended that no more than 25 UTP Cat6 cables be placed in a single J-hook).
 - c. If cable tray is used follow manufacturer guidelines for installation and use a product that is designed specifically for communications cabling. The depth of the tray shall not exceed 4".
 - d. When using J-hooks, locate them staggered between 4 ft to 5 ft to adequately support and distribute the cable's weight. Do not evenly space the hooks, vary between 4 to 5 feet between each hook to prevent signal disruption.
 - e. When using J-hooks install cable with a wheel pulley system that will remove after cable is in place.
 - f. Contractor shall not strap the cables in between hooks to enable easier MACs and to lessen possibility of alien crosstalk.
- 3. Conduit
 - a. When pulling through conduit, cable pulling lubricants shall be continuously applied to all cables and be specifically approved by the cable manufacturer.
 - b. Pull string shall be installed in conduit to allow future MACs. If more than one string is installed in a conduit, the strings shall be labeled for identification of destination.
 - c. Conduits shall have grommets on end to protect the cable.
 - d. No more than (2) 90 degree turns in a given length
- 4. Fill capacities
 - a. Cable pathways shall not be filled greater than the NEC maximum fill for the particular pathway type.
 - b. The fill cable capacity for conduit shall not exceed the following and be no more than 60% full:
 - 1) 1/2 " 0 – Do not use
 - 2) 3/4 " 0 – Do not use
 - 3) 1" 4 – Do not use
 - 4) 1 1/4 " 6
 - 5) 1 1/2" 8
 - 6) 2 " 12
 - 7) 2 1/2 " 16

- 8) 3 " 24
- c. Fill capacity for raceway: (See Manufacturer Specs and Size by Cat6 requirements or 8.4mm/.33in diameter cable)
- 5. Distance Limitations
 - a. Horizontal cable distance (Outlet to Panel) is not to exceed 298 feet.
 - b. Premise cable distance (Outlet to Panel) shall be no less than 55 ft for any cable installed. Coil excess in ceiling if physically closer than 55 ft.
- 6. Aerial cable shall not be utilized.
- E. Bend Radius Limits
 - 1. The minimum bend radius for copper cable 4x cable diameter which is approximately 1.24 inches (31 mm).
 - 2. The minimum bend radius for indoor (ISP) backbone optical fiber when under no load is 10 times the cable diameter and while it is being pulled it is 15 times.
- F. EMI Avoidance
 - 1. Cabling shall be installed to avoid devices that cause electromagnetic interference, such as Microwaves, Refrigerators, lighting, ballasts, power panels, etc.
 - 2. Keep a minimum of 6" from electrical conductor cable.
 - 3. Telecommunications conductors shall not be routed closer than 6 ft. from any lightning protection system conductor.
- G. Cabinets and Racks
 - 1. Only black Velcro cable ties shall be used for bundling and routing. Bundles shall be loose and Velcro ties shall have at least 18 inches between and the bundle shall be loose enough to place two fingers between the cable and the ties.
 - 2. The service coil at the rack shall be located above the rack on the ladder rack/cable tray system or on the wall. Do not place the service coil within the vertical and horizontal wire management.
 - 3. Entrances to cabinets shall be protected with grommets and shall have a conduit stubbed to ceiling space.
 - 4. Installer shall create a detailed floor drawing designating jack locations and labels. A copy shall be attached inside the cabinet or back wall of the rack. The drawing shall also have the date and contractors contact information.
 - 5. Installer shall ensure that every telco rack/cabinet shall have separate and individual patch panels for workstation data cabling for each classroom, office or room space. In-addition, separate and individual patch panels shall be installed for each individual system such as: Extron A/V, Valcom IP Paging, Security Surveillance, and Wireless Access Point devices.
- H. Wire Management
 - 1. When bringing cable into the data rack, keep the bundle size small (optimum size may be 12 cables no more than 24 cables).

DATA COMMUNICATIONS
SECTION 27 1000
3595001000

2. Velcro Ties shall be used in place of cable ties. Do not cinch cables so tightly to deform the cable in any way. It is recommended to leave Velcro ties loose enough to get fingers in between without deforming cable. Velcro ties shall be placed no less than 18 inches from other Velcro straps.
3. Every 48 ports of patch frame shall have its own wire manager below and above (except angled patch frames). The manager shall be d-rings on the front for easy access for MACs. Rear management shall also be used and may be finger style or bar style.
4. In addition to the horizontal managers, the installer shall either install a vertical (WMPVHC45E) Panduit center mounting brackets for the wire managers for vertical management.
5. In addition to binding in Velcro ties, ring runs shall be used for cables run in corners and for drop and rise on walls. These bundles shall be labeled indicating the destination of the bundle (i.e. floor horizontal cables, to TR2, etc.).
6. When cable bundles transition from wall to a floor rack a cable tray or ladder rack shall be utilized. Install brackets on sides to prevent cables from falling off the rack if ladder rack is used.

I. Fire stopping

1. All procedures in this category shall be done in accordance with authority having jurisdiction (AHJ), local codes, CEC, and insurance underwriter's requirements. If a procedure in one of these effects performance, the AHJ shall be alerted immediately in writing.
2. Ensure that materials used are U.L. Listed.
3. For sleeves through ALL walls, EZ Path by Specified Technologies shall be used to ensure a fire stopped pathway on future MAC.
4. Contractor shall put a label per ANSL11A/EIA 569 with warning to not remove, company name and phone number, and date next to each penetration. Contractor shall also place a label stating how many cables can fit within the EZ Path. If initial install fills the firestop, the label shall read "Capacity full — DO NOT ADD CABLES". Do this labeling and take a picture to include in close out docs. Cabling will not exceed 60% fill.
5. If the firestop capacity is filled more than 85% during initial install, contractor shall install an additional EZ Path.

J. Grounding and Bonding

1. All network equipment, shielded cables, patch panels, racks, and tray/ladder rack segments shall be Bonded and Grounded according to TJNEIA 607, BICSI guidelines, CEC, insurance underwriter's requirements, and local code (AHJ). The purpose is to provide a path to ground for all components to ensure personal safety and equipment protection.
2. Ensure that materials used are U.L. Listed.
3. Conduits that contain grounding backbone conductors shall be bonded to the grounding conductor at each end of the conduit. This negates the high impedance choke" effect while the cable carries lightning currents.
4. All racks, trays, and electronics shall be grounded.

5. Contractor shall install on rack an ESD Port Kit on each rack in front and back.
6. The use of aluminum conductors is discouraged in the establishment of grounding scenarios. Aluminum does not provide the lowest resistive path. Additionally, aluminum conductors can become loose from mechanical screw/bolt connections due to vibration from carrying AC current.
7. Panduit's Data Center Grounding Solution and components shall be used. The following components shall be used to form a complete system (see the detailed drawing): Cabinet Grounding Complete Kit, Common Bonding Network Jumper (CBN) Kit, Surge Suppressor Jumper Kit, Front to Back Rail Jumper Kit, Rack Ground Strip Kit, Grounding Bus bar Kit, Paint Piercing Grounding Washers Kit, Thread Forming Screws, and Electrostatic Discharge (ESD) Discharge Port Kit.
8. Contractor shall test the ground system to ensure it has less than 5 Ohms. The test results shall be documented and submitted in close out docs.
9. Documentation: Contractor shall provide a single set of documentation to include test results and Visio "As-built" drawings in both soft copy and hard copy format.
 - a. Workstation Cable: The results of the workstation cable tests shall be provided in the form of printouts from the test equipment as well as computer file copies on CD with the software to read the results included. Test results shall be in PDF format.
 - b. As-Built Drawings: Contractor shall produce drawings depicting data outlet locations as they are actually installed. The drawings shall indicate actual cable routing, work station locations and workstation numbers, to be submitted before final inspection for punch list. Incorrect Visio drawings are punch list items and are to be corrected before re-inspection. "Tracy Unified School District's Telecommunications Jack Legend" shall be applied to all drawings. Results shall be returned to ISET within 30 days.

3.3 TESTING

- A. Testing shall be done with a Fluke Level IV cable tester (DTX 1800 meets this specification) and an Optical Time-Domain Reflectometer (OTDR). The new Fluke DTX 1800 unit is one test set that is capable of testing all frequencies through 900 MHz. If another manufacturer provides this test, contractor shall submit spec sheets and receive written approval for the tester prior to testing.
- B. Contractor shall ensure that the tester has been manufacturer calibrated within nine months of testing and has the latest software version downloaded.
- C. Prior to testing, the tester shall be set for the specific cable and jack used on the project.
- D. A summary test report shall be submitted as well as detailed reports for each cable.
- E. All test results shall have the individual cable label and project name in the header along with the date and time of testing.
- F. Test results shall clearly indicate a Pass or Fail on the report. If a cable fails in one parameter the test is considered a Fail. Marginal Pass cables (indicated with an asterisk) are not acceptable and will be considered as a Fail.

DATA COMMUNICATIONS
SECTION 27 1000
3595001000

- G. Any cable damaged or exceeding recommended installation parameters during installation shall be replaced by the contractor prior to final acceptance at no cost to the Owner.
- H. Test reports shall show a pass result for network standards, continuity, length, cross-talk, attenuation, and ambient noise.
- I. No Splices will be accepted.
- J. An optical time domain reflectometer (OTDR) test will be required on the existing fiber pathways prior to the work commencing and on conclusion of the work. District IT will provide final acceptance of the OTDR test results and sufficiency.

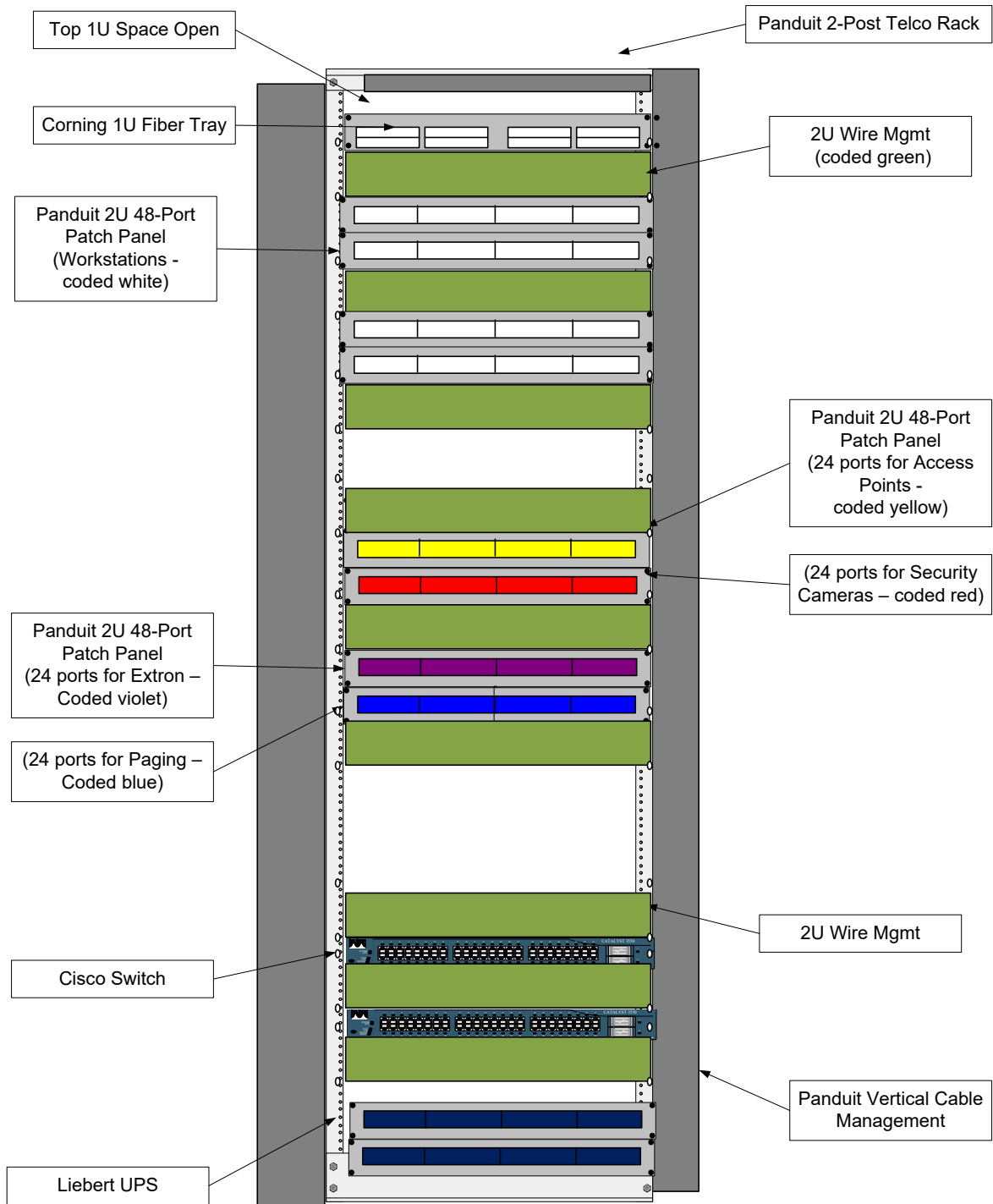
3.4 EXAMINATION /FIELD QUALITY CONTROL

- A. On a daily basis, the contractor's project manager shall inspect the installation to ensure that installers are following the specifications and quality craftsmanship.
- B. Throughout the project regular interval inspections will be completed by an architect representative to eliminate "unchangeable" installations.
- C. If the representative inspects the site and makes a change to the design or installation, this shall be noted in writing. The contractor shall not complete this change until approval is given.
- D. After installation, the architect representative will first inspect the site and create a closeout punch list for contractor to complete.
- E. After completion, the representative and contractor will inspect the site together.

3.5 IDENTIFICATION

- A. The labels are to be laser printed onto adhesive labels using software and labels by Label Ware, Easy Mark, Brady, LabelMo, etc.
- B. Each cable is to be labeled using the following pattern: XXX-A##
 - 1. Segment XXX: Designates the location where the other end of the cable is. That is, at the station it says what room the patch panel is, and at the patch panel it says what room the station is.
 - 2. Segment A: Designates which patch panel the cable is terminated. This allows 26 patch panels per closet.
 - 3. Segment ##: Designates which port on the patch panel the cable is terminated.
- C. Segment A and ## shall be the same on both sides of the cable.
- D. Contractor is to place labels onto the faceplates and panels. In addition, contractor shall place an adhesive label on each end of the cable.
- E. Layout of an IDF rack (*not to scale*). Rack height shall be 72".

**DATA COMMUNICATIONS
SECTION 27 1000
3595001000**



F. Labeling Format

1. All data cables at both the patch panel and the data jacks shall be labeled using the following standard labeling format. The labels are to be laser printed onto

DATA COMMUNICATIONS
SECTION 27 1000
3595001000

adhesive labels using software and labels by Label Ware, Easy Mark, Brady, LabelMo, etc.

2. Telecommunication outlets for a Valcom IP Paging horn, speaker or clock/speaker shall be labeled with its respective Valcom IP device number (machine labels only). Valcom numbers shall be comprised of the room number (i.e. C1, C2, etc.) and Valcom IP device number/drop number (i.e. PA1, PA2, etc.). Each data cable at a telecommunications outlet shall have an alpha identifier for the data jack (i.e. A). No biscuit shall be used and the data jack should be placed inside the Valcom back box. The labeling will start from the main door entering the room and go clockwise around the room. Each workstation cable shall be neatly labeled at each end with its respective workstation number.
3. Labeling for the respective port on the MDF/IDF patch panel shall be:
 - a. C1 – PA1 – A

3.6 CLEANING

- A. All work shall be cleaned to remove all dust, dirt, grease, paint or other marks. All electrical equipment shall be left in a clean condition inside and out, satisfactory to the owner. Keep buildings and premises free from accumulated waste materials, rubbish and debris resulting from work herein, and upon completion of said work, remove tools, appliances, surplus materials, waste materials, rubbish debris, and accessory items used in or resulting from work and legally disposed of offsite. For lead and asbestos dust removal, refer to "Safe School Standards" documentation.

3.7 CLOSEOUT

- A. The contractor will submit to owner within thirty days of completion a closeout package containing:
 1. Hard copy and electronic test results.
 2. Hard copy and electronic as-built drawings with labels (with extra copies to be posted in the E.R. and T.E.s).
 3. Warranty information and manuals.
 4. A bill of materials with part numbers to be used for later MAC.
 5. Hard copy and electronic pictures.
- B. As prerequisite to final acceptance, supply to the owner certificates of inspection from IOR and owner designated RCDD.

- END OF SECTION -

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. Furnish and install new analog devices into existing Analog Sound/Communications System and Analog Clock System, including all wiring and connections and other materials as shown on Plans and specified herein. It is the intent that complete operating systems be installed and that any power supplies, transformers, modules, cards, cages, programming, or other items required to achieve this end result shall be furnished whether or not such item or items are specified herein.
- B. School Application analog equipment supplied by Bogen, Inc. shall be considered as meeting all specification requirements.
- C. The system shall provide distribution of intercom, overhead paging, emergency paging, class change time tones and emergency tones.
- D. System shall be UL 813 and FCC Part 15 listed for safety reasons. Systems not listed are not acceptable.
- E. Site and System Investigation: Sound/Communications System bidder shall visit site prior to bid and become thoroughly knowledgeable about existing system and work required to perform work of this section. Failure to discover the equipment, materials, and labor required to complete the extensions will not relieve the contractor from completing the work at no additional cost. Existing system is Bogen Communitel 2000 legacy system, and all devices shall integrate with existing system.

1.2 GENERAL REQUIREMENTS

- A. System Requirements: All of various equipment components to be complete with all appurtenant accessories required to provide specified facilities and perform specified functions throughout presently planned construction and space; and provisions for expanding system to provide same facilities, and perform same functions in all future planned construction, including space and mountings in consoles and terminal backboards.
- B. Equipment Tests and Standards:
 - 1. For all equipment operating at 26 volts or more, or utilizing over 50 watts, Contractor to submit proof within time allowed for submittals that all items of equipment will conform to requirements of U.L. Label or listing of equipment by U.L. to be accepted as evidence of conformance.
 - 2. For all items of equipment operating at 25 volts or less, and utilizing less than 50 watts, Contractor may submit, in lieu of such label or listing, written certificate from any nationally recognized testing agency, adequately equipped and competent to perform such services, that each item has been tested and conforms to U.L. standards, including method of test of U.L.
- C. Instructions and Manuals:

SOUND AND COMMUNICATIONS

SECTION 27 5123

3595001000

1. Equipment supplier of systems to demonstrate operation of systems to satisfaction of Owner and furnish Owner three (3) wiring schematics for all items of equipment, installation instructions, and details of all routine maintenance and servicing which must be given systems by Owner. Manuals shall be provided in 3-ring binders, with title page, list of contents, and conspicuous label on cover and shall be delivered to District. Submit copy to Architect for approval before delivering to Owner.
2. Supplier shall demonstrate operation of systems and provide training to all end users, administrative staff, and system administrator. Coordinate times of instruction with District, at District's convenience. Supplier shall provide a minimum of 2 hours of user instructions to clerical staff and 4 hours of user/maintenance instructions to District maintenance personnel. Instruction periods shall not coincide and shall be scheduled with District, not school staff. District shall provide list of authorized personnel for training sessions.

D. Submittals:

1. Refer to Section 27 1000.
2. Contractor shall submit name of firms he proposes to do work under this Section, addresses, phone numbers, and name of firm's contact, for approval. Such firms shall be factory authorized representatives of the existing system and submittal shall include manufacturer's letter of confirmation. Proposed firm shall furnish all equipment and specialty cables, make all connections to same, and place the systems in operation. Such firms shall have offices and service departments within a 100 mile radius of project and shall have been in business of this type for at least five years.

E. Record Drawings:

1. Final Inspection will not be made until drawings are received and approved. Record Drawings shall include "As-Built" one-line and wiring diagrams, with terminations identified, wire color coding schedule, pullbox locations, and conduit routing plans.
2. The Contractor shall provide complete drawings detailing all interconnections and panel wiring diagrams in Visio 2000 format.

F. Guarantee:

1. One firm to assume full responsibility for performance on all work of this section. Guarantee all equipment against defects in material and workmanship for two (2) years, and provide on-the-premises service during normal working hours for two years, at no cost to Owner if trouble is not caused by misuse, abuse, or accident, or at current labor rates if so caused. Provide manufacturer's written one-year guarantee for equipment and parts to Owner.
2. Service shall normally be available within 24 hours from service department of authorized distributor of manufacturer by factory trained servicemen.
3. On-the-premises service at other than normal working hours to also be available, but labor charges for such calls to be paid by Owner at current labor rates.

PART 2 - DETAIL REQUIREMENTS AND PRODUCTS

2.1 SOUND/COMMUNICATIONS SYSTEM

- A. General: Install new analog devices into existing Analog Intercommunications System.
- B. Verify existing server is provided and programmed.
- C. Equipment Standards:
 - 1. All enclosures for all equipment to be of metal throughout system. Enclosures other than metal are not acceptable.
 - 2. Speaker grilles to be non-directional diffusion type insulated from speaker by fiber mounting board. Dampening material to be installed between mounting board and grille to prevent metallic resonance.

2.2 SYSTEM CABLING

- 1. Each clock and speaker shall be wired to the signal terminal cabinet located nearest to new building and integrated into existing clock and speaker communication systems.
- 2. Exterior speakers: two 20 AWG shielded twisted pairs
- 3. Interior speakers: two 18 AWG shielded twisted pairs
- 4. Clock: 2-wire, 12 AWG unshielded

2.3 REMOTE EQUIPMENT

- 1. Existing system: Bogen Communitel 2000 legacy system. Provide compatible equipment. All of various equipment components to be complete with all appurtenant accessories required to provide specified facilities and perform specified functions throughout presently planned construction and space; and provisions for expanding system to provide same facilities, and perform same functions in all future planned construction, including space and mountings in consoles and terminal backboards.
 - a. Outdoor Speakers: Provide surface mount backbox and vandal resistant enclosure
 - b. Interior Speakers: Provide square faceplate and recess mount backbox.
 - c. Clock: Provide 12", analog clock and recess mount backbox. Coordinate if existing spare clocks can be provided by the district.

PART 3 - EXECUTION

3.1 INSTALLATION REQUIREMENTS

- A. Electrical Contractor shall retain the services of the duly appointed representative as specified hereinbefore, who shall furnish all equipment, make all connections to same, and place system in operation. Technician and workman employed shall be particularly

SOUND AND COMMUNICATIONS
SECTION 27 5123
3595001000

skilled in this type of work. Workmanship on installed systems shall be of professional quality, best commercial practice.

- B. All wiring throughout entire system shall be installed in conformance with standard industry practice.
- C. Station locations shall be identified by location and school's actual room numbers as furnished by District, and in all ways shall relate as closely as possible to record wiring drawings. Prior to performing final labeling and programming, coordinate information with District.

3.2 CONSTRUCTION MEETINGS

- A. The Contractor shall schedule construction meetings at the jobsite as follows:
 - 1. Prewire meeting shall occur after raceways are installed and prior to pulling of any wire or cable.
 - 2. Pre-termination meeting shall occur after wire and cable has been installed and prior to termination.
- B. Meetings shall be scheduled by the Contractor on a building by building basis and shall include the Project Inspector, School's Representative, the electrical subcontractor, and the Signal System subcontractor as a minimum.

3.3 TESTS

- A. After all equipment specified herein has been installed and is in operating condition, performance tests shall be conducted to determine that installation and components comply with these specifications. Contractor shall furnish competent personnel for these tests.
- B. Perform initial programming of system and audio level adjustments.
- C. Contractor shall physically walk to each speaker and ensure that sound is coming from each speaker.
- D. Contractor shall set the volume level to approximately 6 dB above ambient noise during occupancy.
- E. The sound level for each speaker and zone shall be tested with an audio meter.
- F. Contractor shall provide a drawing showing dB levels for each speaker and zone. The drawing shall be dated and signed by the person administering the test.
- G. Contractor shall test the extension for each room. Extension also be noted on the drawings.
- H. Testing shall be scheduled with the Owner and shall occur after receipt by Architect of Contractor's written certification of completion, record one-line diagram, wiring diagrams, maintenance and operation manuals, and other "As-Built" data required by these specifications. Tests shall be scheduled with School before occupancy occurs.

- END OF SECTION -

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. Furnish and install extensions to the existing Intrusion Alarm System including all wiring and connections and other materials as shown on Plans and specified herein. It is the intent that a complete operating system be installed and that any power supplies, relays, resistors, cards, modules, programming, or other items required to achieve this end result shall be furnished whether or not such item or items are specified herein.
- B. Site and System Investigation: System bidder shall visit site prior to bid and become thoroughly knowledgeable about existing system and work required to perform work of this section. Failure to discover the equipment, materials, and labor required to complete the extensions will not relieve the contractor from completing the work at no additional cost.
- C. Proprietary Systems: Where school is protected and monitored by a proprietary system, such as ADT or Sonitrol, Contractor shall coordinate the exact requirements with those firms. If the Division 16 Contractor elects to use a sound and signal firm other than the proprietary company, the sound and signal firm must include in bid, the materials, equipment, and labor required by the proprietary company to make the extensions complete and fully functional.

1.2 GENERAL REQUIREMENTS

- A. System Requirements: All of various equipment components to be complete with all appurtenant accessories required to provide specified facilities and perform specified functions throughout presently planned construction and space; and provisions for expanding system to provide same facilities, and perform same functions in all future planned construction, including space and mountings in control panels and terminal backboards.
- B. Interruption of Service: Existing intrusion alarm system must be kept operational during unoccupied hours. In the event that the system or portion of system is nonoperational during off-hour periods as a result of work of this contract, the Contractor must provide guard(s) to patrol the campus. Guard(s) and guard duties proposed by Contractor must be acceptable to District and District Police (local enforcement if District does not have its own Police Services). All costs for security guard(s) shall be Contractor's responsibility.

1.3 QUALITY ASSURANCE

- A. Work shall be performed in accordance with all applicable requirements of the edition indicated on the drawings of all governing codes, rules and regulations including but not limited to the following minimum standards, whether statutory or not:
 - 1. California Electric Code (CEC)
 - 2. California Fire Code (CFC)
 - 3. National Fire Alarm Code with California Amendments (NFPA 72)

INTRUSION ALARM SYSTEM
SECTION 28 3100
3595001000

4. Title 3 of the Americans with Disabilities Act
5. Titles 19 and 24 of the California Code of Regulations

1.4 CONTRACTOR QUALIFICATIONS

- A. Fabricator/Installer/Vendor shall be licensed contractor and servicing agent, as well as installer for all components and systems in this System, and be acceptable to manufacturer of the major components of the system. Service personnel shall be capable of serving any and/or all components of the System.
- B. Fabricator/Installer/Vendor must be able to present evidence of technical expertise, be a firm who has successfully installed projects of a similar scope to this project for a minimum of five (5) years, and shall maintain service office within 100 miles of the project site.
- C. All equipment is to be manufactured by a firm/firms who have successfully fabricated elements/systems of a scope similar to this project for a minimum of ten (10) years.
- D. Have a valid State of California Contractor's license in classification C10 - Electrical.
- E. Provide authorized dealer service on-site at facility within four (4) hours of a problem being reported, with this response time available twenty-four (24) hours per day, seven (7) days per week.
- F. Affirm that he maintains, or will maintain, or has access to, a stock of system spares sufficient to ensure that no element of the System will be out of service for more than twenty-four (24) hours due to lack of proper spares.

1.5 SUBMITTALS, O&M'S AND RECORD DRAWINGS

- A. Submittals:
 1. Contractor shall submit name of firm he proposes to do work under this Section, addresses, phone numbers, and name of firm's contact, for approval. Such firms shall be factory authorized representatives of the system and submittal shall include manufacturer's letter of confirmation. Proposed firm shall furnish all equipment and specialty cables, make all connections to same, and place the systems in operation. Such firms shall have offices and service departments within a 100 mile radius of project and shall have been in business of this type for at least five years.
 2. Submittals shall be complete and include catalog data, shop drawings, one-line diagrams, battery calculations, voltage drop calculations, and scaled plan drawings. Building plans shall be 1/8"=1'-0", and site plans shall be no smaller than 1"=40'.
 3. Shop Drawings shall contain complete wiring and schematic diagrams for equipment furnished, equipment layout, conduit and wiring layout drawings, and any other details required to demonstrate that system has been coordinated and will properly function as a unit. Equipment Vendor shall check Drawings for adequacy of conductors and raceways for proposed system. Include in Bid

Amount all required raceways, conductors and material necessary to suit proposed system.

B. Operation and Maintenance Manuals:

1. Operating Instruction Manuals outlining the step-by-step procedures required for system start-up and operations shall be furnished. The instructions shall include manufacturer's name, model number, service manual parts list, and brief description of all equipment and their basic operating features.
2. Maintenance Instruction Manuals outlining maintenance procedures shall be furnished. The manual shall include a troubleshooting guide listing possible breakdowns and repairs and a simplified connection wiring diagram for the system as installed.

C. Record Drawings: Final Inspection will not be made until drawings are received and approved. Record Drawings shall include "As-Built" one-line and wiring diagrams, with terminations identified, wire color coding schedule, pullbox locations, and conduit routing plans.

D. Furnish to District a printed copy of the control panel programming upon completion of final system programming.

E. Performance Test Reports: Upon completion of installed system, submit in booklet form all field tests performed to prove compliance with the specified performance criteria. Each test report shall indicate the final position of controls.

1.6 TRAINING

A. Supplier shall demonstrate operation of systems and provide training to all end users, administrative staff, and system administrator. Coordinate times of instruction with District, at District's convenience. Supplier shall provide a minimum of 1 hour of user instructions to clerical staff and 2 hours of user/maintenance instructions to District maintenance personnel. Instruction periods shall not coincide and shall be scheduled with District, not school staff. Deliver to Owner at time of demonstration, all settings and codes programmed into system. Furnish three copies on manufacturer's standard programming worksheets. District shall provide list of authorized personnel for training sessions.

1.7 GUARANTEE

A. One firm to assume full responsibility for performance on all work of this section. Guarantee all equipment against defects in material and workmanship for two (2) years, and provide on-the-premises service during normal working hours for two years, at no cost to Owner if trouble is not caused by misuse, abuse, or accident, or at current labor rates if so caused. Provide manufacturer's written one-year guarantee for equipment and parts.

B. Service shall normally be available within 24 hours from service department of authorized distributor of manufacturer by factory trained servicemen.

INTRUSION ALARM SYSTEM
SECTION 28 3100
3595001000

- C. On-the-premises service at other than normal working hours to also be available, but labor charges for such calls to be paid by Owner at current labor rates.

PART 2 - DETAIL REQUIREMENTS AND PRODUCTS

2.1 SYSTEM OPERATION

- A. Activation of an intrusion alarm sensor shall cause a signal to be transmitted to a Central Station via telephone lines. Signal transmission shall be initiated by a built-in dialer unit. In addition to alarm reporting, system shall report trouble, low battery, and shunted zone indications.

2.2 SYSTEM DESCRIPTION

- A. A. Intrusion Detection Control Panels: Basis-of-design is the Honeywell VISTA 128BPT System, a burglary/access control/CCTV switching system that includes the following capabilities:
 - 1. Listed for UL Commercial Burglary.
 - 2. Supports up to 128 zones.
 - 3. Supports up to 8 separate partitions.
 - 4. Supports up to 150 users.
 - 5. Supports commercial wireless devices.
 - 6. Provides integrated security, access control, and CCTV switching capability.
 - 7. Provides supervision of peripheral devices.
 - 8. Supports long-range radio (LRR) communication.
 - 9. Provides scheduling capability to allow for automated operations.
 - 10. Supports alarm reporting via Internet.
 - 11. Interfaces with automation software.
 - 12. Monitors smoke detector maintenance signals
 - 13. Capable of being installed using existing wiring

2.3 MANUFACTURER

- A. Intrusion Detection Alarm Panel Manufacturer: System VISTA 128BPT by Honeywell, www.security.honeywell.com.

2.4 SYSTEM PERFORMANCE

- A. Control Panel: Existing control panel shall be verified by contractor to be an 8-partition, UL commercial and burglary control panel that supports up to 128 zones using basic hardwired, polling loop, and wireless zones, RF receivers, and relay modules. The control shall provide the ability to schedule time-driven events, and allow certain operations to be automated by pressing a single button. The system shall be capable of interfacing with an ECP long range radio (LRR) unit that can send Contact ID messages. The control shall provide integrated access control and CCTV-switching capability with the use of a single downloader and database.
1. Basic Hardwired Zones: Control shall provide 8 style-B hardwire zones.
 2. Optional Expansion Zones:
 - a. Polling Loop Expansion: Control shall support up to 120 additional hardwire zones using a built-in two-wire polling (multiplex) loop interface. The polling loop shall provide power and data to remote point modules, and constantly monitor the status of all zones on the loop. Maximum current draw shall not exceed 128 mA.
 - b. Wireless Expansion Zone: Control shall support up to 128 wireless zones using a 5800 series RF receiver (fewer if using hardwire and/or polling loop zones).
 3. Partitions: Control shall provide the ability to operate 8 separate areas, each functioning as if it had its own control.
 4. User Codes: Control shall accommodate 150 user codes, all of which can operate any or all partitions.
 5. Peripheral Devices: Control shall support up to 30 addressable ECP devices, which can be any combination of keypads, RF receivers, relay modules, and interactive phone module.
 6. Keypad/Annunciator: Control shall accommodate up to 16 keypads or six (6) touchscreen (i.e.; advanced user interface) keypads.
 7. Optional Output Relays: A total of 96 relay outputs shall be accommodated using relay modules. Each relay module shall provide four (4) Form C (normally open and normally closed) relays for general-purpose use.

INTRUSION ALARM SYSTEM
SECTION 28 3100
3595001000

8. Optional Vista Interactive Phone Module: The control shall support the ADEMCO 4285/4286 VIP Modules, which permit access to the security system.
9. Integrated Access Control
10. CCTV Switching: System shall be capable of supporting the VistaView 100 CCTV Switching System. The CCTV system shall be fully integrated and be event driven by Burglary or Access events. When cameras are not event driven, they shall be driven by an automatic preset dwell time.
11. Commercial Wireless Equipment: Control shall be compatible with UL Listed Commercial Wireless Security equipment.
12. Optional Keyswitch: Control shall support the ADEMCO 4146 Keyswitch on any one of the system's 8 partitions. If used, zone 7 is no longer available as a protection zone.
13. Voltage Triggers: System shall provide voltage triggers, which change state for different conditions. Used with devices such as a remote keypad sounder or keyswitch ARMED and READY LEDs.
14. Event Log: System shall maintain a log of different event types (enabled in programming). The event log shall provide the following characteristics:
 - a. Stores up to 512 events.
 - b. Viewable at the keypad or through the use of Compass software.
 - c. Printable on a serial printer, including zone alpha descriptors.
15. Scheduling: Provides the following scheduling capabilities:
 - a. Open/close schedules (for control of arming/disarming and reporting).
 - b. Holiday schedules (allows different time windows for open/close schedules).
 - c. Timed events (for activation of relays, auto-bypassing and un-bypassing, autoarming and disarming, etc.).
 - d. Access schedules (for limiting system access to users by time).
 - e. End User Output Programming Mode (provides 20 timers for relay control).
 - f. The system shall automatically adjust for daylight savings time.
16. Communication Features: Supports the following formats and features for the primary and secondary central station receivers:
 - a. Formats: ADEMCO Express; ADEMCO Contact ID 4 and 10 Digit Acct number.
 - b. Backup reporting: The system shall support backup reporting via the following: Secondary phone number; ECP long-range radio (LRR)

- interface; option to select long range radio (LRR) or dialup as the primary reporting method (dynamic signaling feature).
- c. Internet reporting: The system shall be capable of communicating with the central station via the internet using Alarmnet-i. It shall provide the user with the ability to control the system via a browser interface. All packet data transmitted to the monitoring station shall be encrypted with a minimum of 1024 bits of encryption.
- 17. Audio Alarm Verification Option: Provides a programmable Audio Alarm Verification (AAV) option that can be used in conjunction with an output relay to permit voice dialog between an operator at the central station and a person at the premises.
 - 18. Cross-Zoning Capability: Helps prevent false alarms by preventing a zone from going into alarm unless its cross-zone is also faulted within 5 minutes.
 - 19. Exit Error False Alarm Prevention Feature: System shall be capable of differentiating between an actual alarm and an alarm caused by leaving an entry/exit door open.
 - 20. Built-in User's Manual and Descriptor Review: For end-user convenience, the control panel shall contain a built-in User's Manual.
 - 21. Programming: Control shall be capable of being programmed locally or remotely using the ADEMCO Compass Downloader.

2.5 COMPONENTS

- A. Equipment and accessories furnished under the terms of these specifications shall be the standard products of the manufacturers specified or required. All equipment shall be listed by U.L. All equipment and accessories shall be compatible with the system.
 - B. System Integration: System shall integrate with facility doors, windows, and departments. The system shall also integrate with external systems, such as building appliances and building alert systems for remote control and central collection of external system alerts. When integrated with external systems, the system shall connect to the external system to receive status changes by way of a dry contact output from the external system. The system shall use its user interface to provide local status messages from external systems, providing for the initiation of local building policies. Optionally, the system may transmit information to an off-site monitoring service to provide initiation of remote policies when appropriate. The installer shall follow manufacturer's instructions when installing and programming system equipment.
- 1. V-Plex Bus Extensions: Extended system V-Plex bus branch circuits shall be scalable to increase the total size of the bus in larger installations. Branch circuits leading from different buildings or from different floors in multi-story buildings

INTRUSION ALARM SYSTEM
SECTION 28 3100
3595001000

shall be isolated from one another so that a shorted or grounded branch circuit is isolated away from other near-side branch circuits, allowing other V-Plex devices to be isolated so that they can continue to operate.

2. Zone Input: System zone inputs allow the system to sense the change in state of an output from an external device, such as a door/window position sensor, a motion detector, a relay output from an appliance, the output of an external alert system, or other devices that provide a dry closure output.
3. Combined AlarmNet-I (Internet) and AlarmNet-GSM (Global System for Mobile) Fire Alarm Communication: The facility system shall be monitored using both the AlarmNet-I and the AlarmNet-G Communication services. The system shall use Honeywell's AlarmNet IGSMCF Fire Alarm transmitter or equivalent. The communication service shall employ a two-way Internet connection through AlarmNet Communication Service as the primary method of communication, and then the two-way GPRS (General Packet Radio Service) as the secondary means of communication and shall use SMS (Short Message Service) as a tertiary means of communication. The equipment shall be UL listed for use in this application. The installer shall follow manufacturer's instructions when installing the AlarmNet unit.
4. VSI Bus Isolation and Integrity: System V-Plex bus branch circuits shall be isolated from one another so that a shorted, overloaded, or grounded branch circuit is isolated away from other near-side branch circuits, allowing undamaged V-Plex bus circuits to continue to operate. VSI Isolation modules shall be installed at near-side connections to cable runs leading to additional buildings, at cable runs leading to additional floors in multi-story buildings, and at junction boxes leading to multiple VPlex branch circuits within the system. The installer shall use the Honeywell VSI module or equivalent.
5. Zone Input: System zone inputs allow the system to sense the change in state of an output from an external device, such as a door/window position sensor, a motion detector, a relay output from an appliance, the output of an external alert system, or other devices that provide a dry closure output.
6. Door Contact: V-Plex: Honeywell Model 4939SN surface mount sensor.
7. Motion Detector, Wall-Mounted, V-Plex: Honeywell Model DT7500SN V-Plex Dual-Tec Motion Detector.
8. Keypad, Alpha Display: Honeywell Vista 6160 keypad.
9. End of line resistors, as required.
10. Power Supplies: Altronics SMP Series with output voltage and capacity as required. Provide with appropriate transformer, enclosure(s), and battery(s). Battery(s) shall be sized to provide 24 hours of backup power. Provide power supplies as necessary.

11. RJ-31X mounted on Main Telephone Terminal Backboard.
- C. Wiring: The contractor shall provide cables consistent with the manufacturer's recommendations. The following general guidelines shall be followed for wiring installation:
1. Wiring shall be appropriately color-coded with permanent wire markers. Copper conductors shall be used.
 2. All signal cables provided under this contract shall be Class II, plenum-rated cable where required. Where subject to mechanical damage, wiring shall be enclosed in metal conduits or surface metallic raceway.
 3. Data wires shall not be enclosed in conduit or raceways containing AC power wires.
 4. Where EMI may interfere with the proper operation of the DACS circuits, twisted/shielded cable shall be used.

PART 3 - EXECUTION

3.1 INSTALLATION REQUIREMENTS

- A. Work shall be installed as shown on the Drawings in accordance with the manufacturer's diagrams and recommendations, except where otherwise indicated.
- B. Electrical Contractor shall retain the services of the duly appointed representative as specified hereinbefore, who shall furnish all equipment, make all connections to same, and place system in operation. Technician and workman employed shall be particularly skilled in this type of work.
- C. At existing sites, the existing system shall be tested as soon as possible after award of contract and prior to preparing submittals. Contractor shall test entire system to ensure proper operation. Any defects or deficiencies found shall be listed and presented to Owner in letter form. It will be assumed that existing equipment is fully functional unless identified otherwise by Contractor.
- D. Control panel shall be mounted with sufficient clearance for observation and testing.
- E. All junction boxes must be clearly marked for distinct identification.
- F. Panel enclosures shall comply with the Requirements of UL 864. Enclosures having doors over forty-eight inches (48") in height shall be provided with a three (3) point catch and lock; all other doors shall contain a cabinet type cylinder lock. Inserts shall be blind fastened so that no screws show on panel front.
- G. Detectors shall be installed in accordance with manufacturer's written instructions in areas as indicated on the Drawings.
- H. Circuits shall be terminated on screw terminals. Terminal blocks shall be Allen-Bradley Bulletin 1492 with 600 volt screw terminals for #22 to #10 conductors, mounted to type

INTRUSION ALARM SYSTEM
SECTION 28 3100
3595001000

N22 channel, or approved equal. Submittal shall show internal elevation of terminal cabinets with equipment laid out.

- I. All cables shall be run through fanning strip to terminals of terminal blocks.
- J. All cables entering terminal cabinet shall be identified with T&B Vinyl, Brady Permashield mylar markers, or equal. Upon completion of installation, six (6) copies of one-line "as-built" wiring diagram shall be furnished to Architect.
- K. Each cable run on wiring diagram shall be identified with exact wire marker code (numerical or alphabetical) as appears in terminal cabinets.
- L. Detector locations shown on drawings are approximate only. Exact locations shall be coordinated with lighting and mechanical equipment and shall be placed in accordance with manufacturer's recommendations (with respect to supply air diffusers, etc.).
- M. Station locations shall be identified by school's actual room numbers and system shall be programmed accordingly. Coordinate actual room numbers with District. Coordinate final programming with District. Contractor shall furnish a printed copy of final programming to District.
- N. End-of-line resistors shall be installed at locations readily accessible, not above an elevation of 10 feet above finish floor or grade, or as shown on Drawings.
- O. No splices shall occur in underground pullboxes. System wiring shall be continuous, without splices, from terminal cabinet to terminal cabinet and control panel to devices. All interior pullboxes shall be accessible and locations shall be recorded on "As-Built" drawings.
- P. Door contacts shall be located 6" from strike side of door and both the switch and magnet shall be "glued" in place with clear silicone. Wiring shall enter door frame through jamb. Do not drill headers.
- Q. Each detector installed in this contract shall have a popit. Each door contact installed in this contract shall have a popit, unless door contacts are shown grouped on drawings. In rooms with accessible ceilings, mount popit in junction box above ceiling. Where hard ceilings occur, provide flush box high on wall or on ceiling with blank finish plate. Wiring shall go to popits, then down to detectors.
- R. Protected areas accessing remote keypads shall be wired and connected on delay zone, separate from all other protected areas.
- S. After all equipment is installed and is operational, Intrusion Alarm System subcontractor shall set angle settings, sensitivity settings, etc., of each detector to ensure optimum performance and minimal false alarms. Mask out areas of each motion type detector to remove sources of false alarms (windows, heaters, air diffusers, etc.) from detection zones.

3.2 CONSTRUCTION MEETINGS

- A. The Contractor shall schedule construction meetings at the jobsite as follows:

1. Pre-rough-in meeting shall occur before installation of any boxes, raceways, etc. Exact locations of all detectors shall be established as recommended by the Intrusion Alarm System subcontractor.
 2. Prewire meeting shall occur after raceways are installed and prior to pulling of any wire or cable.
 3. Pre-termination meeting shall occur after wire and cable has been installed and prior to termination.
- B. Meetings shall be scheduled by the Contractor on a building by building basis and shall include the Project Inspector, School's Representative, the electrical subcontractor, and the Intrusion Alarm System subcontractor as a minimum.
- C. One-half to three-quarters of the way through project, District Facilities will set up a meeting (preferably at the school site) with decision makers from Facilities, Police Services, Maintenance, Maintenance Alarm Tech, General Contractor, Alarm Sub-contractor, and School Administrator to review the alarm protocol and to identify responsible personnel and timelines.

3.3 TESTS

- A. After all equipment specified herein has been installed and is in operating condition, performance tests shall be conducted to determine that installation and components comply with these specifications.
1. Testing shall be scheduled by the Contractor and shall be conducted at time least disruptive to school activities and as approved by District. Contractor shall provide technicians to conduct all testing (from same firm preparing submittals and performing intrusion alarm work). Testing shall be coordinated to include the Project Inspector and a representative from Engineer's office.
 2. At time of testing, Contractor shall ensure that his submittal will reflect all materials and work necessary to make new equipment function properly with existing.
 3. Contractor shall furnish all instruments and personnel required for tests.
 4. Conduct tests for following:
 - a. Verify that the system is free of grounds or open circuits. The central control board shall indicate when a ground or open circuit exists.
 - b. Verify that devices are functioning as specified.
- B. Testing shall be reconducted to verify correction of any defect found in initial testing.
- C. After system is completely tested, the Contractor shall take the following actions with the Owner:
1. The Contractor will schedule a meeting with the Alarm Sub-contractors and Owner's Representatives to determine alarm zone and device nomenclature. The Contractor shall ensure that the alarm zone and device nomenclature matches

INTRUSION ALARM SYSTEM
SECTION 28 3100
3595001000

the actual building and door or room numbers used by the school. Architectural numbering shall not be used. Once confirmed, the Contractor shall demonstrate this to Owner's Representatives.

- END OF SECTION -

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Engineered fill materials.
 - 2. Imported engineered fill material.
 - 3. Landscape backfill material'
 - 4. Decomposed granite.
 - 5. Aggregate base.

1.2 RELATED REQUIREMENTS

- A. Section 01 5000, Temporary Facilities and Controls.
- B. Section 01 5713, Erosion Control.
- C. Section 01 8113, Sustainable Design Requirements, for CAL-Green **[and Collaborative for High Performance Schools (CHPS)]** general requirements and procedures.
- D. Section 31 2333, Trenching and Backfilling.
- E. Section 32 1200, Asphalt Concrete Paving.
- F. Section 32 1600, Site Concrete.
- G. Section 33 0000, Utilities
- H. Section 33 4000, Storm Drainage Utilities.

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CAL Green), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- C. Local Jurisdiction: Any work within the street, highway or right-of-way shall be performed in accordance with the requirement of the governmental agencies having jurisdiction, and shall not begin until all of those governing authorities have been notified.
- D. ASTM International (ASTM):
 - 1. D698-00 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures, Using 5.5 lb (2.49 Kg) Rammer and 12 inch (304.8 mm) Drop.
 - 2. D1556-00 - Test Method for Density of Soil in Place by the Sand-Cone Method.

**EARTHWORK
SECTION 31 0000
3595001000**

3. D1557-02e2 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 10 lb. (4.54 Kg) Rammer and 18 inch (457 mm) Drop.
4. D3017-05 Test Methods for Moisture Content of Soils and Soil-Aggregate Mixture by Nuclear Methods (Shallow Depth).
5. D422-63(2007) e1 Test Method for Particle Size Analysis of Soil.
6. D4318-05 Test Method for Liquid Limit, Plastic Limit, and Plasticity Limit.

E. CALTRANS Standard Specifications Section 17.

F. CAL-OSHA, Title 8, Section 1590 (e).

1.4 ADMINISTRATION REQUIREMENTS

A. Submittal Procedures:

1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
3. Sustainable Design Submittals shall comply with the additional requirements of Section 01 8113, Sustainable Design Requirements.

B. Site Visitation: All bidders interfacing with existing conditions shall visit the site prior to bid to verify general conditions of improvements. Discrepancies must be reported prior to the bid for clarification.

1.5 ACTION SUBMITTALS

A. Provide supplier's descriptive literature for all products to demonstrate compliance with specified attributes.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Contractor / Installer.

1.7 CLOSEOUT SUBMITTALS

A. Guarantee: Submit subcontractor's guarantee.

1.8 QUALITY ASSURANCE

A. Contractor / Installer shall have been in business for five (5) years providing/finishing similar size projects and complexity.

B. Contractor shall be solely responsible for all subgrades built. Failures resulting from inadequate compaction or moisture content are the responsibility of the contractor. Contractor shall be solely responsible for any and all repairs.

C. The representatives of the Owner's testing lab will not act as supervisor of construction, nor will they direct construction operations. Neither the presence of the Owner's testing

lab representatives nor the testing by the Owner's testing lab shall excuse the contractors or subcontractors for defects discovered in their work during or following completion of the project. Correcting of inadequate compaction or moisture content is the sole responsibility of the contractor.

- D. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.
- E. All materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.
- F. Tests (See Part 3, Article "Testing and Observation" for Compaction Testing).

1.9 DELIVERY, STORAGE AND HANDLING

- A. Transport, store and handle in strict accord with the local jurisdiction.

1.10 FIELD CONDITIONS

1.11 EXISTING SITE CONDITIONS

- A. Contractor shall acquaint himself with all site conditions. If unknown active utilities are encountered during work, notify Architect promptly for instructions. Failure to notify will make Contractor liable for damage to these utilities arising from Contractor's operations subsequent to discovery of such unknown active utilities.
- B. Existing civil, mechanical and electrical improvements are shown on respective site plans to the extent known. Should the Contractor encounter any deviation between actual conditions and those shown, he is to immediately notify the Architect before continuing work.

1.12 ON SITE UTILITY VERIFICATION AND REPAIR PROCEDURES

- A. Ground-breaking requirements:
 - 1. All underground work performed by a Contractor must be authorized by the District's Construction Manager or the Low Voltage Consultant prior to start of construction.
 - 2. The Contractor is to obtain and keep the original School's construction utility site plans on site during all excavation operations. Contractor can contact the District's Construction Manager, Facilities Manager, or the Low Voltage Consultant to procure the drawings.
- B. Underground Utility Locating:
 - 1. The contractor shall hire an Underground Utility Locating Service to locate existing underground utility pathways in areas effected by the scope of work for excavation.
 - 2. Contractor must use an underground utility locator service with a minimum of 3 years experience. The equipment operator must have demonstrated experience.

EARTHWORK
SECTION 31 0000
3595001000

Contact Norcal Underground Locating (800/986-6722) or Precision Locating (800/577-7324)

3. The Underground Utility Locator Service must have the use of equipment with the ability to locate by means of inductive clamping, induction, inductive metal detection, conductive coupling, or TransOnde (Radiodetection) to generate signals, passive locating (free scoping) for "hot" electric, and metal detector.
4. The Underground Utility Locator Service must be able to locate existing utilities at a depth of at least 72".
5. The Underground Utility Locator Service must be able to locate but are not limited to locating the following types of utility pathways:
 - a. All conduit pathways containing 110 volt or greater 50-60Hz electrical wire.
 - b. All conduit pathways containing an active cable TV system.
 - c. All conduit pathways containing wire or conductor in which a signal can be attached and generated without damaging or triggering the existing systems.
 - d. All empty conduit pathways or pipe in which a signal probe or sonde (miniature transmitter) can be inserted.
 - e. All conduit pathways containing non-conductive cables or wires in which a signal probe or sonde (miniature transmitter) can be inserted.
 - f. All plastic and other nonconductive water lines in which a TransOnde Radiodetection) or other "transmitter" can be applied to create a low frequency pressure wave (signal) without damaging or triggering the existing systems.
 - g. All copper or steel waterlines and plastic or steel gas lines.
6. All markings made by the Underground Utility Locator Service or other shall be clear and visible.
7. The contractor shall maintain all markings made by Underground Utility Locator Service or other throughout the entire length of the project.
8. The Underground Utility Locator Service shall provide the contractor with two sets of maps showing the location of utilities and average depth. They will be referenced to permanent buildings. Contractor will deliver one copy to the district at no additional charge.
9. Contractor is responsible to contact Underground Service Alert (U.S.A. 800/227-2600) and receive clearance prior to any excavation operations.
10. Contractor shall inform the (District's Construction Manager)(Architect)(Owner) no later than five (5) days prior to the date scheduled for the utility locator service to be on site.

1.13 PROTECTION

- A. Adequate protection measures shall be provided to protect workmen and passers-by on and off the site. Adjacent property shall be fully protected throughout the operations. Blasting will not be permitted. Prevent damage to adjoining improvements and properties both above and below grade. Restore such improvements to original condition should damage occur. Replace trees and shrubs outside building area disturbed by operations.

- B. In accordance with generally accepted construction practices, the Contractor shall be solely and completely responsible for working conditions at the job site, including safety of all persons and property during performance of the work. This requirement shall apply continuously and shall not be limited to normal working hours.
- C. Any construction review of the Contractor's performance conducted by the Geotechnical Engineer is not intended to include review of the adequacy of the Contractor's safety measures, in, on, or near the construction site.
- D. Provide shoring, sheeting, sheet piles and or bracing to prevent caving, erosion or gullyng of sides of excavation.
- E. Surface Drainage: Provide for surface drainage during period of construction in manner to avoid creating nuisance to adjacent areas. The contractor shall make a reasonable effort on a daily basis to keep all excavations and the site free from water during entire progress of work, regardless of cause, source, or nature of water.
- F. Adjacent streets and sidewalks shall be kept free of mud, dirt or similar nuisances resulting from earthwork operations.
- G. The site and adjacent influenced areas shall be watered as required to suppress dust nuisance. Dust control measures shall be in accordance with the local jurisdiction.
- H. Trees: Carefully protect existing trees that are to remain. Provide temporary irrigation as necessary to maintain health of trees.

1.14 SEASONAL LIMITS

- A. No fill material shall be placed, spread or rolled during unfavorable weather conditions. When work is interrupted by rains, fill operations shall not be resumed until field tests indicate that moisture content and density of fill are satisfactory.
- B. Excessively wet fill material shall be bladed and aerated per Article "Subgrade Preparation".

1.15 TESTING

- A. General: Refer to Section 01 4523 - TESTING AND INSPECTION SERVICES, AND STRUCTURAL TESTS AND INSPECTIONS LIST, DSA-103.
- B. Geotechnical Engineer: Owner is retaining a Geotechnical Engineer to determine compliance of fill with Specifications, and to direct adjustments in fill operations. Costs of Geotechnical Engineer will be borne by Owner; except those costs incurred for re-tests or re-inspection will be paid by Owner and backcharged to Contractor.
 - 1. If Contractor elects to process or mine onsite materials for use as Suitable Fill, Aggregate Sub Base, Aggregate Base, Rock, Crushed Rock or sand the cost of all testing of this material shall be paid for by the Contractor.
 - 2. Testing of import fill for compliance with Department of Toxic Substance Control (DTSC) shall be paid for by the Contractor.

**EARTHWORK
SECTION 31 0000
3595001000**

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Engineered Fill Materials: All fill shall be of approved local materials supplemented by imported fill if necessary. "Approved" local materials are defined as local soils tested and approved by Geotechnical Engineer free from debris, and concentrations of clay and organics; and contain rocks no larger than 3-inches in greatest dimension. The soil and rock should be thoroughly blended so that all rock is surrounded by soil. This may require mixing of the soil and rock with a dozer prior to placement and compaction. Clods, rocks, hard lumps or cobbles exceeding 3-inches in final size shall not be allowed in the upper 6 inches of any fill. Native clay or clayey soils will not be permitted within the upper 12 inches of building pad areas or paved areas.
- B. Imported Engineered Fill Material: Imported fill may be required to complete work. Proposed import fill material shall meet the above requirements; shall be similar to the native soils. Import fill shall meet the above requirements; shall have plasticity index of 20 or less; an Expansion Index of 15 or less; be free of particles greater than 3-inch (3") in largest dimension; be free of contaminants and have corrosion characteristics within the acceptable limits. All import fill material shall be tested and approved by Soils Engineer prior to transportation to the site. Proposed fill material shall comply with DTSC guidelines to include Phase 1 environmental site assessment and related tests. Refer to the October 2001 DTSC Information Advisory for clean imported fill material.
1. DTSC TESTING: Site work contractor is to coordinate testing with an analytical lab, hired by the owner, licensed by the State of California for the DTSC testing. The costs associated with testing will be paid by the contractor.
 2. DTSC testing shall include documentation as to the previous land use, location, and history. Soils shall be analyzed for all compounds of concern to ensure the imported soil is uncontaminated and acceptable. Testing shall be performed per the recommendations included in DTSC Imported Fill Advisory http://www.dtsc.ca.gov/Schools/upload/SMP_FS_Cleanfill-Schools.pdf). Soils shall be tested prior to import to the project site.
 3. Lab shall determine geographically which tests and analysis comparison will be appropriate for the testing. (CAM 17 / Title 22); (RWQCB) Regional Water Quality Control Board; or (OEHHA) Office of Environmental Health Hazard Assessment.
 4. Frequency of testing shall be conducted in accordance with DTSC's Imported Fill Advisory as follows;

Fill Material Sample Schedule	
Area Of Individual Borrow Area	Sampling Requirements
2 Acres or less	Minimum of 4 samples
2 to 4 Acres	Minimum of 1 sample every ½ acre
4 to 10 Acres	Minimum of 8 samples

**EARTHWORK
SECTION 31 0000
3595001000**

Greater than 10 Acres	Minimum of 8 locations with 4 subsamples per location
-----------------------	---

Volume of Borrow Area Stockpile	
Up to 1,000 Cubic Yards	1 sample per 250 cubic yards
1,000 to 5,000 Cubic Yards	4 samples for the first 1000 cubic yards + 1 sample per each additional 500 cubic yards
Greater than 5,000 Cubic Yards	12 samples for the first 5,000 cubic yards + 1 sample per each additional 1,000 cubic yards

5. Reports/ Documentation
 - a. Results of the testing analysis shall be sent to the Owner; Architect; Project Inspector, Project Civil Engineer, DTSC, and DSA. Letter shall reference DSA file and application numbers.
- C. Landscape Backfill Material:
 1. The top 3" of native topsoil stripped from the site may be used for landscape backfill material.
- D. Water: Furnish all required water for construction purposes, including compaction and dust control. Water shall be potable.
- E. Aggregate Base: Provide Class 2 3/4" Aggregate Base conforming to standard gradation as specified in Cal Trans Standard Specifications, Section 26,-1.02A.
- F. Decomposed Granite: Decomposed Granite shall be well graded mixture of fine to 1/8" particles in size with no clods. The material shall be free of vegetation, other soils, debris and rock. The material shall be redish-tan to tan in color.
- G. Decomposed Granite Solidifier: PolyPavement or equal.

PART 3 - EXECUTION

3.1 INSPECTION LAYOUT AND PREPARATION

- A. Prior to installation of the work of this Section, carefully inspect and verify by field measurements that installed work of all other trades is complete to the point were this installation may properly commence
- B. Layout all work, establish grades, locate existing underground utilities, set markers and stakes, setup and maintain barricades and protection facilities; all prior to beginning

**EARTHWORK
SECTION 31 0000
3595001000**

actual earthwork operations. Layout and staking shall be done by a licensed Land Surveyor or Professional Civil Engineer.

- C. Verify that specified items may be installed in accordance with the approved design.
- D. In event of discrepancy, immediately notify Owner and the Architect. Do not proceed in discrepant areas until discrepancies have been fully resolved.

3.2 PERFORMANCE

A. GENERAL:

- 1. General: Do all grading, excavating and cutting necessary to conform finish grade and contours as shown. All cuts shall be made to true surface of subgrade.
- 2. Archaeological Artifacts: Should any artifacts of possible historic interest be encountered during earthwork operations, halt all work in area of discovery and immediately contact the Architect for notification of appropriate authorities.
- 3. Degree of Compaction: Percentage of maximum density, hereinafter specified as degree of compaction required, means density equivalent to that percentage of maximum dry density determined by ASTM D1557 Compaction Test method, and such expressed percentage thereof will be minimum acceptable compaction for specified work.
- 4. Moisture Content: Moisture content shall be as noted below and as called for on the plans. Moisture content shall be maintained until subgrade is covered by surfacing materials.

3.3 DEMOLITION, DISPOSAL AND DISPOSITION OF UNDESIRABLE MAN-MADE FEATURES

- A. All other obstructions, such as abandoned utility lines, septic tanks, concrete foundations, and the like shall be removed from site. Excavations resulting from these removal activities shall be cleaned of all loose materials, dish shaped, and widened as necessary to permit access for compaction equipment. Areas exposed by any required over-excavation should be scarified to a depth of 12", moisture-conditioned to near optimum moisture content, and recompacted to at least 95% of the maximum dry density.

3.4 TESTING AND OBSERVATION

- A. All grading and earthwork operations shall be observed by the Geotechnical Engineer or his representative, serving as the representative of the Owner.
- B. Field compaction tests shall be made by the Geotechnical Engineer or his representative. If moisture content and/or compaction are not satisfactory, Contractor will be required to change equipment or procedure or both, as required to obtain specified moisture or compaction. Notify Geotechnical Engineer at least 48 hours in advance of any filling operation.
- C. Earthwork shall not be performed without the notification or approval of the Geotechnical Engineer or his representative. The Contractor shall notify the Geotechnical Engineer at least two (2) working days prior to commencement of any aspect of the site earthwork.

- D. If the Contractor should fail to meet the compaction or design requirements embodied in this document and on the applicable plans, he shall make the necessary readjustments until all work is deemed satisfactory, as determined by the Geotechnical Engineer or Architect/Engineer.
- E. After each rain event Geotechnical Engineer shall test fill material for optimum moisture. Do not place any fill material until desired moisture is achieved.

3.5 CLEARING AND GRUBBING

- A. Prior to grading, remove all debris off-site. Remove trees and brush including the root systems. Holes resulting from tree and brush removal should be prepared and backfilled in accordance with paragraphs 3.7, 3.8, 3.9, and 3.10. This may require deepening and/or widening the holes to adequately remove disturbed soil and provide room for compaction equipment. Strip the surface of all organics. Strippings meeting the requirements of Section 32 9000 may be used in landscape areas only.

3.6 CUTTING

- A. Building pads that are located within a cut/fill transition area will have to be overexcavated to provide a semi-uniform fill beneath the building pad. The portions of building pads located in cut areas shall be overexcavated to provide no more than 1 foot difference in fill placed in the same building pad.
- B. Do all cutting necessary to bring finish grade to elevations shown on Drawings.
- C. When excavation through roots is necessary, cut roots by hand.
- D. Carefully excavate around existing utilities to avoid unnecessary damage. The contractor shall anticipate and perform hand work near existing utilities as shown on the survey, without additional claims or cost.

3.7 STRUCTURAL EXCAVATION

- A. General: Excavate to bear on firm material at contract depth shown on Structural Drawings.
- B. Footings: All footing excavations shall be of sufficient width for installation of formwork, unless earth will retain its position during concreting. All portions of footings above grade must be formed. In the event that footings are placed against earth, footing widths below grade shall be increased 2 inches from those shown on Drawings and positive protection shall be provided for top corners of trench.
- C. Unsuitable Ground: Any errors in structural excavation, soft ground, or clay soils found when excavating shall be reported to Architect. In no case shall work be built on any such soft or clayey unsuitable surface without direction from the Architect. Restore excavations to proper elevation with engineered fill material compacted to 95% of dry density.

**EARTHWORK
SECTION 31 0000
3595001000**

3.8 SUBGRADE PREPARATION

- A. Grade compact and finish all subgrades within a tolerance of 0.10' of grades as indicated on Drawings and so as not to pool water. Subgrade within building pads and concrete walks shall be within 0.05' of grades indicated.
- B. After clearing, grubbing and cutting, subsurface shall be plowed or scarified to a depth of at least 12", until surface is free from ruts, hummocks or other uneven features. Moisture condition to 2% above optimum moisture content and recompact to at least 95% of the maximum dry density as determined by ASTM Test Method D1557. If the existing soils are at a water content higher than specified, the contractor shall provide multiple daily aerations by ripping, blading, and/or discing to dry the soils to a moisture content where the specified degree of compaction can be achieved. After seven consecutive working days of daily aerations, and the moisture content of the soil remains higher than specified, the contractor shall notify the architect. If the existing soils have a moisture content lower than specified, the contractor shall scarify, rip, water and blade existing soil to achieve specified moisture content. The contractor shall make proper allowance in schedule and methods to complete this work.
- C. After subgrade for fill within building pad area or within paved areas has been cleared, plowed and scarified, it shall be disked or bladed until uniform and free from large clods, brought to 2% above optimum moisture content and compacted to not less than 95% of maximum dry density, as determined by ASTM Test Method D1557, and such expressed percentage thereof will be minimum acceptable density for specified work.
- D. Subgrade in areas to receive landscaping shall be compacted to (85%).
- E. Where Contractor over-excavates building pads through error, resulting excavation shall be recompacted as engineered fill at Contractor's expense.

3.9 PLACING, SPREADING AND COMPACTING FILL MATERIAL IN BUILDING PAD AND PAVEMENT AREAS

- A. Selected fill material shall be placed in layers which, when compacted, shall not exceed 6 inches in compacted thickness. Each layer shall be spread evenly and thoroughly mixed to insure uniformity in moisture content.
- B. Selected fill material shall be moisture-conditioned to specified moisture content. Selected fill material shall be unfrozen. When moisture content of fill material is below that specified, add water until proper moisture content is achieved. When moisture content is above that specified, aerate by blading or other methods mentioned in 3.08 B until moisture content is satisfactory.
- C. After each layer has been placed, mixed and spread evenly, it shall be thoroughly compacted to a minimum of 90% as determined by the ASTM D1557 Compaction Test. Compact each layer over its entire area until desired density has been obtained.
- D. Recomposition of Fill in Trenches and Compaction of Fill Adjacent to Walls: Where trenches must be excavated, backfill with material excavated. Place in lifts that when compacted do not exceed 6", moisture conditioned to (optimum)(2% above optimum)

moisture content, and compact to a minimum of 90% relative compaction in building pad and paved areas, and to 90% relative compaction in landscape areas.

- E. Jetting of fill materials will not be allowed.

3.10 FINAL SUBGRADE COMPACTION

- A. Building Pads: Upper 12" of all final building pad subgrades (including future buildings) shall be uniformly compacted at specified moisture content to at least 90% of maximum dry density, as determined by ASTM D1557 Compaction Test, regardless of whether final subgrade elevation is attained by filling, excavation, or is left at existing grade. After acceptance of final compaction test, contractor shall maintain the required moisture content of subgrade until concrete flatwork is placed.
- B. Paved Areas: Upper 12" of all final subgrades supporting pavement sections and all other flatwork shall be brought to specified moisture content and shall be uniformly compacted to not less than 95% of maximum dry density, regardless of whether final subgrade elevation is attained by filling, excavation, or is left at existing grade. After acceptance of final compaction test, contractor shall maintain the required moisture content of subgrade until concrete flatwork is placed.
- C. Other Fill and Backfill: Upper 12" of all other final subgrades or finish grades shall be compacted to 90% of maximum dry density.
- D. Gravel Fill: Do not place compacted gravel fill until after underground work and foundations are in place. Compact gravel fill with vibratory plate or similar equipment to preclude settlement.

3.11 PLACING, SPREADING, AND COMPACTION OF LANDSCAPE BACKFILL MATERIALS

- A. All landscaped areas shall receive topsoil. After subgrade under landscape area has been scarified and brought to 85% maximum dry density, top soil shall be placed evenly to depth of 12" at 85% of maximum dry density.
- B. Project Inspector must verify that materials are uniformly spread to minimum depth specified.

3.12 SLOPE CONSTRUCTION

- A. Cut slopes shall be constructed to no steeper than 2:1(horizontal:vertical). Fill slopes shall be constructed to no steeper than 2:1 (horizontal:vertical). Prior to placement of fill on an existing slope the existing slope shall be benched. The benches shall be in a ratio of 2 horizontal to 1 vertical. The face of the fill slopes shall be compacted as the fill is placed, or the slope may be overbuilt and then cut back to the design grade. Compaction by track walking will not be allowed.

3.13 FINISH GRADING

- A. At completion of project, site shall be finished graded, as indicated on Drawings. Finish grades shall be "flat graded" to grades shown on the drawing. Mounding of finish grades

**EARTHWORK
SECTION 31 0000
3595001000**

will not be allowed unless otherwise directed on the landscape drawings. Tolerances for finish grades in drainage swales shall be $\pm 0.05'$. Tie in new and existing finish grades. Leave all landscaped areas in finish condition for lawn seeding. Landscaped planters shall be graded uniformly from edge of planter to inlets. If sod is used for turf areas the finish grade on which it is placed shall be lowered to allow for sod thickness.

- B. All landscape areas shall be left free of rock or foreign material.
- C. All landscape areas shall be approved by Architect prior to any planting.

3.14 SURPLUS MATERIAL

- A. Excavated material not required for grading or backfill shall be removed from site at contractor's expense.

3.15 CLEANING

- A. Refer to Section 01 7700.
- B. Remove from fill all vegetation, wood, form lumber, casual lumber, and shavings, in contact with ground; buried wood will not be permitted in any fill.

END OF SECTION

*s:\master specifications\division 31 - earthwork\31 0000_earthwork.docx
Received from WCEI: June 7, 2018, Updated format: 9-3-21*

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Trench backfill materials.

1.2 RELATED REQUIREMENTS

- A. Section 01 5000, Temporary Facilities and Controls.
- B. Section 01 8113, Sustainable Design Requirements, for CAL-Green **[and Collaborative for High Performance Schools (CHPS)]** general requirements and procedures.
- C. Section 31 0000, Earthwork.
- D. Section 32 8000, Irrigation.
- E. Section 33 0000, Utilities
- F. Section 33 4000, Storm Drainage Utilities.

1.3 REREENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CAL Green), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- C. California Plumbing Code (CPC), edition as noted on the drawings.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Submittal Procedures:
 - 1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
 - 2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
 - 3. Sustainable Design Submittals shall comply with the additional requirements of Section 01 8113, Sustainable Design Requirements.
- B. Coordination:
 - 1. General Contractor shall coordinate work as herein specified, in accordance with drawings and as required to complete scope of work with all related trades.

TRENCHING AND BACKFILLING
SECTION 31 2333
3595001000

1.5 ACTION SUBMITTALS

- A. Provide supplier's descriptive literature for all products to demonstrate compliance with specified attributes:

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For contractor / Installer.

1.7 CLOSEOUT SUBMITTALS

- A. Guarantee: Submit subcontractor's guarantee.

1.8 QUALITY ASSURANCE

- A. Contractor / Installer shall have been in business for five (5) years providing/finishing similar size projects and complexity.
- B. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.
- C. All materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.

1.9 DELIVERY, STORAGE AND HANDLING

- A. Transport, store and handle in strict accord with the local jurisdiction.

1.10 FIELD CONDITIONS

- A. Contractor shall acquaint himself with all existing site conditions. If unknown active utilities are encountered during work, notify Architect promptly for instructions. Failure to notify will make Contractor liable for damage to these utilities arising from Contractor's operations subsequent to discovery of such unknown active utilities.
- B. Trench dewatering may be necessary. Contractor shall provide any and all tools, equipment and labor necessary for trench dewatering no matter what the source. Dewatering shall be continuous until all site utilities are installed and backfilled.

1.11 PROTECTION

- A. Adequate protection measures shall be provided to protect workers and passers-by on and off the site. Adjacent property shall be fully protected throughout the operations. Blasting will not be permitted. Prevent damage to adjoining improvements and properties both above and below grade. Restore such improvements to original condition should damage occur. Replace trees and shrubs outside building area disturbed by operations. Repair all trenches in grass areas with new sod (seeding not permitted) and "stake-off" for protection.

TRENCHING AND BACKFILLING
SECTION 31 2333
3595001000

- B. Contractor shall be solely and completely responsible for working conditions at the job site, including safety of all persons and property during performance of the work. This requirement shall apply continuously and shall not be limited to normal working hours.
- C. Any construction review of the Contractor's performance conducted by the Architect or Owner is not intended to include review of the adequacy of the Contractor's safety measures, in, on or near the construction site.
- D. Provide shoring, sheeting, sheet piles and or bracing to prevent caving, erosion or gulying of sides of excavation.
- E. Surface Drainage: Provide for surface drainage during period of construction in manner to avoid creating nuisance to adjacent areas. Keep all excavations free from water during entire progress of work, regardless of cause, source or nature of water.
- F. Adjacent streets and sidewalks shall be kept free of mud, dirt or similar nuisances resulting from earthwork operations.
- G. The site and adjacent influenced areas shall be watered as required to suppress dust nuisance.
- H. Trees: Carefully protect existing trees which are to remain.

1.12 TRENCH SAFETY PROVISIONS

- A. General Contractor shall be solely responsible for safety design, construction and coordination with agencies having jurisdiction. If such plan varies from shoring system standards established by Construction Safety Orders, plan shall be prepared by registered civil or structural engineer.
- B. Nothing herein shall be deemed to allow use of shoring, sloping or protective system less effective than that required by Construction Safety Orders of California State Division of Industrial Safety.
- C. When trenching through paved surface, provide steel trench plates to cover open trenches daily until trenches are backfilled.

1.13 SEASONAL LIMITS

- A. No backfill material shall be placed, spread or rolled during unfavorable weather conditions. When work is interrupted by heavy rains, full operations shall not be resumed until field tests indicate that moisture content and density of fill are satisfactory.
- B. Material above optimum moisture shall be processed per Section 31 0000, Part 3, Article "Subgrade Preparation".

1.14 TESTING

- A. General: Refer to Section 31 0000, Part 1, Article "Testing" and Part 3, Article "Testing and Observation".

TRENCHING AND BACKFILLING
SECTION 31 2333
3595001000

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Backfill materials: Pipeline and conduit trench backfill as shown on the plans and as specified below.
 - 1. $\frac{3}{4}$ inch crush rock.
 - 2. Native Materials: Soil native to Project Site, free of wood, organics, and other deleterious substances. Rocks shall not be greater than 3-inches.
 - 3. Sand: Fine granular material, free of organic matter, mica, loam or clay.
 - 4. Lean Mix Concrete: 3 sacks of cement per yard plus sand.
 - 5. Class 2 aggregate base, $\frac{3}{4}$ " rock, per Caltrans Section 26-1.02B
 - 6. Controlled Density Fill: 3 sack slurry backfill.
- B. Water: Furnish all required water for construction purposes, including compaction and dust control. Water shall be potable.
- C. Provide other bedding and backfill materials as described and specified in Section 33 0000, Section 33 4000 and Divisions 22 and 26.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verification of Conditions:
 - 1. Examine areas and conditions under which work is to be performed.
 - 2. Identify conditions detrimental to proper or timely completion of work and coordinate with General Contractor to rectify.

3.2 INSTALLATION

- A. Perform work in accordance with pipe manufacturer's recommendations, as herein specified and in accordance with drawings.

3.3 TRENCHING

- A. Make all trenches open vertical construction with sufficient width to provide free working space at both sides of trench around installed item as required for caulking, joining, backfilling and compacting; not less than 12 inches wider than pipe or conduit diameter, unless otherwise noted.
- B. Carefully excavate around existing utilities to avoid unnecessary damage. The contractor shall anticipate and perform hand work near existing utilities as shown on the survey, without additional claims or cost.
- C. Trench straight and true to line and grade with bottom smooth and free of edges or rock points.

TRENCHING AND BACKFILLING
SECTION 31 2333
3595001000

- D. Where depths are not shown on the plans, trench to sufficient depth to give minimum fill above top of installed item measured from finish grade above the utility as follows:
1. Sewer pipe: depth to vary
 2. Storm drain pipe: depth to vary
 3. Water pipe - Fire Supply: 36 inches
 4. Water pipe – Domestic Supply: 30 inches

3.4 BACKFILL

- A. Pipe Trench Backfill is divided into three zones:
1. Bedding: Layer of material directly under the pipe upon which the pipe is laid.
 2. Pipe Zone: Backfill from the top of the bedding to 6 inches (compacted) over the top of the pipe.
 3. Upper Zone: Backfill between top of Pipe Zone and to surface of subgrade.
- B. Bedding: Type of material and degree of compaction for bedding backfill shall be as defined in the Details and Specifications.
- C. Pipe Zone and Upper Zone Backfill:
1. Type of material and degree of compaction Pipe Zone and Upper Zone Backfill shall be as required by Drawings, Details, & Specifications.
 2. Upper Zone Backfill shall not be placed until conformance of Bedding and Pipe Zone Backfill with specified compaction test requirements has been confirmed.
 3. Backfill shall be brought up at substantially the same rate on both sides of the pipe and care shall be taken so that the pipe is not floated or displaced. Material shall not be dropped directly on pipe.
- D. Backfill Compaction:
1. Backfill shall be placed in layers which, when compacted shall not exceed 6 inches in thickness. Each layer shall be spread evenly and thoroughly mixed to insure uniformity. Do not backfill over, wet, frozen or soft subgrade surfaces. Employ a placement method that does not disturb or damage foundation walls, perimeter drainage, foundation damp-proofing, waterproofing or protective cover.
 2. When moisture content of fill material is below that required to achieve specified density, add water until proper moisture content is achieved. When moisture content is above that required, aerate by blading or other methods until specified moisture content is met; see Section 31 0000, Part 3, Article "Subgrade Preparation".
 3. After each layer has been placed, mixed and spread evenly, it shall be thoroughly compacted to 95% of maximum dry density while at specified moisture content. Compact each layer over its entire area until desired density has been obtained.
 4. Compaction: All backfill operations shall be observed by the Inspector of Record and/or Geotechnical Engineer. Field density tests shall be made to check compaction of fill material. If densities are not satisfactory, Contractor will be

TRENCHING AND BACKFILLING
SECTION 31 2333
3595001000

required to change equipment or procedure or both, as required to obtain specified densities. Notify Inspector and Architect at least 24 hours in advance of any operation.

E. Backfill in Areas Previously Lime or Cement Treated

1. Where trenching occurs in areas that have been lime or cement treated, class 2 aggregate bases or approved controlled density backfill material shall be used for the top 12-inches minimum of the trench or thickness shall match the depth of treated material.

3.5 TRENCH AND SITE RESTORATION

- A. Finished surface of trenches shall be restored to a condition equal to, or better than the condition as existed prior to excavation work.

3.6 PROTECTION

- A. Protect existing surfaces, structures, and utilities from damage. Protect work by others from damage. In the event of damage, immediately repair or replace to satisfaction of Owner.
- B. Repair existing landscaped areas to as new condition. Replant trees, shrubs or groundcover with existing materials if not damaged or with new materials if required. Replace damaged lawn areas with sod, no seeding will be permitted.
- C. Replace damaged pavement with new compatible matching materials. Concrete walks to be removed to nearest expansion joint and entire panel replaced. Asphalt to be cut neatly and replaced with new materials.
- D. Any existing materials removed or damaged due to trenching to be returned to new condition.

3.7 SURPLUS MATERIAL

- A. Remove excess excavated material, unused materials, damaged or unsuitable materials from site.

3.8 CLEANING

- A. Refer to Section 01 7700.
- B. Contractor will keep the work areas in a clean and safe condition so his rubbish, waste, and debris do not interfere with the work of others throughout the project and at the completion of work.
- C. After completion of work in this section, remove all equipment, materials, and debris. Leave entire area in a neat, clean, acceptable condition.

TRENCHING AND BACKFILLING
SECTION 31 2333
3595001000

END OF SECTION

s:\master specifications\division 31 - earthwork\31 2333_trenching and backfilling.docx
Received from WCEI: October 20, 2012; Updated 9-2-21

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Concrete curbs and gutters.
2. Concrete pavement, sidewalks and ramps.
3. Steel reinforcing for flatwork and curbs.
4. Truncated domes.

1.2 RELATED REQUIREMENTS

- A. Section 01 6116, Volatile Organic Compound (VOC) Restrictions; for VOC limits pertaining to adhesives, sealants, fillers, primers, and coatings.
- B. Section 01 8113, Sustainable Design Requirements, for CAL-Green **[and Collaborative for High Performance Schools (CHPS)]** general requirements and procedures.
- C. Division 31, Earthwork.
- D. Section 32 1200, Asphalt Concrete Paving.

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CALGreen), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- C. American Concrete Institute (ACI):
1. 117: Specification for Tolerances for Concrete Construction and Materials and Commentary.
 2. 211.1: Standard Practice for Selecting Proportions for Normal, Heavyweight and Mass Concrete.
 3. 301: Specifications for Structural Concrete.
 4. 302.1R: Guide to Concrete Floor and Slab Construction.
 5. 305R: Guide to Hot Weather Concreting.
 6. 306R: Guide to Cold Weather Concreting.
 7. 308R: Guide to External Curing of Concrete.
 8. 318: Building Code Requirements for Structural Concrete and Commentary.
 9. 347R: Guide to Formwork for Concrete.
- D. ASTM International (ASTM):

1. A615/A615M: Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement.
 2. A706/A706M: Standard Specification for Deformed and Plain Low-Alloy Steel Bars for Concrete Reinforcement.
 3. C33/C33M: Standard Specification for Concrete Aggregates.
 4. C94/C94M: Standard Specification for Ready-Mixed Concrete.
 5. C143/C143M: Standard Test Method for Slump of Hydraulic-Cement Concrete.
 6. C150/C150M: Standard Specification for Portland Cement.
 7. C260/C260M: Standard Specification for Air-Entraining Admixtures for Concrete.
 8. C309: Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete.
 9. C330/C330M: Standard Specification for Lightweight Aggregates for Structural Concrete.
 10. C494/C494M: Standard Specification for Chemical Admixtures for Concrete.
 11. C618: Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete.
 12. C920: Standard Specification for Elastomeric Joint Sealants.
 13. C1107/C1107M: Standard Specification for Packaged Dry, Hydraulic Cement Grout (Non-Shrink).
 14. C1315: Standard Specification for Liquid Membrane-Forming Compounds Having Special Properties for Curing and Sealing Concrete.
 15. D1751: Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types).
 16. D5893/D5893M: Standard Specification for Cold Applied, Single Component, Chemically Curing Silicone Joint Sealant for Portland Cement Concrete Pavements.
- E. Concrete Reinforcing Steel Institute (CRSI):
1. Manual of Standard Practice.
 2. Placing Reinforcing Bars.
- F. State of California, Department of Transportation (Caltrans):
1. Division of Engineering Services:
 - a. California Test 342: Method of Test for Surface Skid Resistance with the California Portable Skid Test.
 2. Standard Specifications.
 - a. Section 51, Concrete Structures.
 - b. Section 52, Reinforcement.
 - c. Section 73, Concrete Curbs and Sidewalks.
 - d. Section 90, Concrete.
- G. US Government General Services Administration (GSA/SAE):

1. GSA/SAE AMS-STD-595A: Colors Used In Government Procurement.

1.4 ADMINISTRATIVE REQUIREMENTS

A. Submittal Procedures:

1. Action Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
3. Sustainable Design Submittals shall comply with the additional requirements of Section 01 8113, Sustainable Design Requirements.

1.5 ACTION SUBMITTALS

A. Shop Drawings: Joint pattern layout for walks and pavement.

B. Product Data:

1. A complete list of materials proposed to be used for the site concrete work including, but not limited to, sand, gravel, admixtures, surface treatments, coloring agents, sealers, cast-in-place accessories, forming and curing products, concrete mix designs, reinforcing materials, joint materials, curing materials, and detectable warning surface.
2. Manufacturer's descriptive literature for products proposed for use. Include installation instructions, and maintenance instructions.

C. Concrete Mix Design: The Contractor shall submit three copies of each proposed mix design for each class of concrete in accordance with ACI 301, Sections 3.9 "Proportioning on the Basis of Previous Field Experience or Trial Mixture," or 3.10 "Proportioning Based on Empirical Data." The Contractor shall submit a separate mix design for concrete to be placed by pumping, in addition to the mix design for concrete to be placed directly from the truck chute.

1. The following information shall be included in the concrete mix design:
 - a. Proportions of cement, fine and coarse aggregate, and water.
 - b. Water-cement ratio, 28-day compressive design strength, slump, and air content.
 - c. Type of cement and aggregate.
 - d. Special requirements for pumping.
 - e. Range of ambient temperature and humidity for which design is valid.
 - f. Special characteristics of mix, which require precautions in mixing, placing, or finishing techniques to achieve specified finished product.
2. Do not begin concrete production until mixes have been reviewed and approved by Engineer.
 - a. Review of mix design by the Architect and Engineer shall in no way relieve the subcontractor of his responsibility for the performance of the concrete.

D. Qualification Data: For manufacturer

- E. Delivery tickets as specified for ready-mixed concrete.
- F. Sustainable Design:
 - 1. General:
 - a. Submit information necessary to establish and document compliance with the California Green Building Standards Code.
 - b. Sustainable design submittals are in addition to other submittals.
 - 2. The following information shall be provided:
 - a. Adhesives and Sealants: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.
 - b. Paints and Coatings: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.

1.6 CLOSEOUT SUBMITTALS

- A. Guarantee: Submit subcontractor's guarantee.

1.7 QUALITY ASSURANCE

- A. Qualifications:
 - 1. Manufacturer of ready-mixed concrete products shall meet ASTM C94/C94M requirements for production facilities and equipment.
- B. Design, erect, support, brace and maintain formwork and shoring to safely support all loads that might be applied until such loads can be carried by concrete.
- C. The Contractor shall perform work in accordance with ACI 301.
- D. Use only new materials and products.
- E. Single-Source Responsibility: Use materials and products of one manufacturer whenever possible.
- F. Materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.
- G. Testing to determine compliance with the work of this Section will be the responsibility of the Contractor.
 - 1. Cement and reinforcing shall be tested in accordance with CBC Section 1910A. Testing of reinforcing may be waived in accordance with Section 1910A.2 when approved by the Engineer and DSA.
 - 2. Testing will be performed by an independent testing and inspecting agency in accordance with Section 01 4523, Testing and Inspection Services, and paid for by the Owner.
 - 3. Refer to Article FIELD QUALITY CONTROL in Part 3 of this Section for additional requirements.

4. Cost of retests and coring due to low strength or defective concrete will be paid by the Owner and back-charged to the Contractor.
- H. Sieve analysis from testing laboratories identifying rock/sand percentages within the concrete mix; or class 2 aggregate base shall have the current Project name and Project location identified on the report. Outdated analytical reports greater than 90 days old will not be accepted.
- I. Mockups: Provide on-site mockup panels for each type of exposed colored concrete flatwork showing texture and color before proceeding with finish to be used on this Project.
 1. Construct sample panels after review and approval of samples.
 2. Size: Minimum 5 feet square and have at least one longitudinal and one transverse joint unless a more specific note indicates otherwise on Drawings.
 3. Construct sample panels at location approved by Architect.
 4. Construct sample panels in ample time to allow for finishing and curing before requesting Architect to review.
 5. Follow procedures used on accepted samples.
 6. Include saw-cut and tooled joints to match method and appearance proposed for use in completed work.
 7. Prepare successive sample panels as required until finish, color, and appearance is approved by Architect.
 8. Do not remove sample panels until authorized in writing by the Architect and all concrete work has been approved.

1.8 DELIVERY, STORAGE AND HANDLING

- A. Deliver undamaged products to job in manufacturer's sealed containers and/or original bundles with tags and labels intact.
- B. Store materials in protected, dry conditions off of ground and in areas so as to not interfere with the progress of the Work.
- C. Transport, store and handle in strict accordance with the manufacturer's written recommendations.
- D. Store cement in weather tight building, permitting easy inspection and identification. Protect from dampness. Lumpy or stale cement will be rejected.
- E. Aggregates: Prevent excessive segregation, or contamination with other materials or other sizes of aggregate. Use only one supply source for each aggregate stock pile.

1.9 FIELD CONDITIONS

- A. Make and be responsible for all field dimensions necessary for proper fitting, slopes, and completion of work. Report discrepancies to Architect before proceeding.
- B. Do not place concrete during rain without adequate protection.

- C. The Contractor shall conform to ACI 306R when mixing and placing concrete during cold weather. Provide sufficient protection when daily temperatures drop below 40 degrees F.
- D. The Contractor shall conform to ACI 305R when mixing and placing concrete during hot weather. When air temperature exceeds 100 degrees F adjust concrete mix with retarding admixture in design mix, and adequately test and take additional measures as directed by concrete supplier.
- E. The Contractor shall maintain access for vehicular and pedestrian traffic as required for other construction activities. Use temporary striping, flagmen, barricades, warning signs, and warning lights as required.
- F. Placing in hot weather: Comply with ACI 305R. Concrete shall be delivered, placed and finished in a sufficiently short period of time to avoid surface dry checking.
 - 1. Concrete shall not exceed 85 degrees F at time of placement.
 - 2. Concrete shall be kept wet continuously after tempering until implementation of curing compound procedure in accordance with this specification.
 - 3. Evaporation Retarder: Apply evaporation retarder to concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 pounds per square foot per hour, before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.
- G. Placing in Cold Weather: Comply with ACI 306R. Protect from frost or freezing. No antifreeze admixtures are permitted.
 - 1. When placing concrete during freezing or near-freezing weather, mix shall have temperature of at least 50 degrees F but not more than 90 degrees F.
 - 2. Concrete shall be maintained at temperature of at least 50 degrees F for not less than 72 hours after placing or until it has thoroughly hardened.
 - 3. Provide necessary thermal coverings for any flat work exposed to freezing temperatures.

PART 2 - PRODUCTS

2.1 DESIGN AND PERFORMANCE CRITERIA

- A. Contractor shall comply with requirements applicable to this Section for concrete materials, admixtures, bonding materials, curing materials, surface sealers and others as required.
- B. Concrete walking surfaces shall have a coefficient of friction not less than 0.30 and will be subject to testing to verify compliance as specified in Article FIELD QUALITY CONTROL.
 - 1. The coefficient of friction will be measured by California Test 342 before pavement is opened to public traffic, but not sooner than 7 days after concrete placement.

2. Contractor shall notify the Architect and Project Inspector of pavement having a coefficient of friction less than 0.30.
- C. Sustainable Design:
1. VOC emissions for field-applied adhesives, sealants, and sealant primers must comply with limits specified in Section 01 6116.
 2. VOC emissions for field-applied paints and coatings must comply with limits specified in Section 01 6116.

2.2 FORMING MATERIALS

- A. Form Material: Steel, wood, or other suitable material of size and strength to resist movement during concrete placement and to retain horizontal and vertical alignment until removal. Use straight forms, free of distortion and defects. Use flexible spring steel forms or laminated boards to form radius bends as required. The forms shall be of a depth equal to the depth of curbing or sidewalk, and so designed as to permit secure fastening together at the tops. Coat forms with non-staining type coating that will not discolor or deface surface of concrete.
1. Concrete Exposed to View: 5/8-inch minimum APA B-B Plyform, steel or "Sonotube" forms by Sunoco, 888-875-8754, or equal.
 2. Concrete Concealed from View: 5/8-inch minimum APA B-B Plyform, steel or 1 x 8 DF, Number 2 Grade or better.
- B. Form Ties: Snap off metal of fixed length, leaving no metal within 1-1/2 inches of surface and no fractures, spalls or other surface defects larger than 1 inch diameter; manufactured by Burke, Dayton Superior, or equal.
- C. Spreaders: Metal. Wood is not permitted.
- D. Form Coating: Coat forms with non-staining material that will not discolor or deface surface of concrete or leave any residue on concrete that would interfere with surface coating as approved by the Architect.
- E. Chamfer Strips: Rigid polyvinyl chloride, 3/4-inch x 3/4-inch, in maximum possible lengths, manufactured by Burke, Greenstreak, Vulco, or equal.

2.3 REINFORCING MATERIALS

- A. Reinforcement Bars: New billet steel deformed bars conforming to requirements of ASTM A615/A615M or ASTM A706/A706M; Grade 60.
1. Bars for dowels installed through expansion joints or construction joints to existing sidewalks or concrete features shall be smooth or if deformed shall be sleeved on one end for slippage.
- B. Reinforcing Supports: Galvanized metal chairs or spacers or metal hangers, accurately placed 3 feet on center each way, staggered, with each support securely fastened to steel reinforcement in place.

1. Bottom bars in footings may be supported with 3-inch concrete blocks with embedded wire ties.
2. Concrete supports without wire ties will not be allowed.

2.4 CONCRETE MATERIALS

- A. Cement: Portland cement in accordance with ASTM C150/C150M, Type II, low alkali.
- B. Concrete Aggregates: Graded from coarse to fine in accordance with ASTM C33/C33M.
 1. Normal Weight Aggregates: Clean and free from deleterious coatings, clay balls, roots, and other extraneous materials, and in conformance with ASTM C33/C33M, except as otherwise specified. Combined grading shall meet limits of ASTM C33/C33M.
 - a. Size: Not be larger than one-fifth of the narrowest dimension between forms, or larger than three-fourths of the minimum clear spacing between reinforcing bars.
 2. Lightweight Aggregates:
 - a. General: Durable particles suitably processed, washed and screened without adherent coatings, free of materials with deleterious reactivity to alkali in cement, and conforming to ASTM C330/C330M.
 - b. Fine aggregate shall be natural sand, or sand prepared from stone or gravel, with grains free of silt, loam and clay.
- C. Water: Potable, clean, and in accordance with ASTM C94/C94M, free from injurious amounts of oil, acids, alkalis, salts, scale, organic materials or other deleterious matter, and in compliance with ACI 318 Section 26.4.1.3.
- D. Fly Ash: Western Fly Ash, conforming to ASTM C618 for Class N or Class F materials and in accordance with CBC Section 1903A.6.
 1. Class C is not permitted.
 2. Proportions: Not more than 15 percent (by weight) may be substituted for portland cement.

2.5 ADMIXTURES

- A. Water Reducing Admixture: Admixture to improve placing, reduce water cement ratio and ultimate shrinkage; "WRDA 64" by GCP Applied Technologies, or equal conforming to ASTM C494/C494M and ACI 318 Section 3.6.
 1. Water reducing admixture may be used subject to prior approval by the Architect, Engineer, and the Testing Lab.
 2. Proposed product and quantity shall be included in original design mix.
- B. Air-Entraining Admixture: "Daravair 1000" by GCP Applied Technologies or equal conforming to ASTM C260 and ACI 318, section 26.4.1.4.
 1. Proportion air entraining concrete to attain specified minimum 28-day compressive strength.

2. Total air entrainment in concrete shall be not less than 4 percent or more than 6 percent of the volume of concrete.
- C. Glare Reduction Colorant: Concentrated pigment dispersions designed to permanently color concrete; "Chromix L10 Base-Black" by Sika Corporation, or equal. *Was within 2.2 H.1*

2.6 CURING MATERIALS

- A. Clear Curing Compound: Water-based membrane-forming concrete curing compound in accordance with ASTM C309 and C1315; "Aqua Resin Cure Clear" by Burke CO, "1100" by W.R. Meadows, or equal.

2.7 ADDITIONAL MATERIALS AND COMPONENTS

- A. Concrete Bonding Agent: The following, or equal, conforming to ASTM C1059/C1059M.
 1. "Weld-Crete" by Larson Products Corporation, 800-633-6668.
 2. "Daraweld C" by GCP Applied Technologies, 877-423-6491.
- B. Patching Mortar: One-component, trowel applied, migrating-corrosion-inhibitor enhanced, polymer-modified, shrinkage-compensated, fiber reinforced, micro-silica enhanced, cementitious repair mortar for horizontal, vertical, and overhead applications; "Meadow-Crete GPS" by W.R. Meadows, or equal.
- C. Non-Shrink Grout: Premixed, non-metallic, no chlorides, non-staining and non-shrinking conforming to ASTM C1107/C1107M; "MasterFlow 713" by Master Builders Solutions, a division of BASF, 800-433-9517, or equal.
- D. Drainage Rock Base: 3/4-inch aggregate size conforming to Class 2 Aggregate Base as defined in Caltrans Standard Specifications Section 26, or equal clean free-draining gravel or crushed rock as recommended by the Geotechnical Engineer.
- E. Expansion Joint Material: Preformed 3/8-inch fiber material, with bituminous binder manufactured for use as concrete expansion joint material and conforming to ASTM D1751 and approved by Architect.
 1. Furnish joint fillers in one-piece lengths for full width being placed, wherever possible. Where more than one length is required, lace or clip joint-filler sections together.
- F. Joint Sealant for Expansion Joints in Concrete: Weather and UV resistant, single component, cold applied silicone sealant, Type S, conforming to ASTM D5893/D5893M; ASTM C920, Grade P, Class 25, Use T.
 1. Self-Leveling: "DOWSIL 890-SL Silicone Joint Sealant" by Dow Chemical Company, or equal.
 2. At Slopes Exceeding 5 Percent: Non-sagging; "DOWSIL 888 Silicone Joint Sealant" by Dow Chemical Company, or equal.
 3. Color: As standard with manufacturer.

- G. Pre-Formed Plastic Expansion Joint Caps: Polystyrene, with removable tops; "Snap Cap" by W. R. Meadows, Tex-Trude expansion caps, or equal.
- H. Truncated Domes: Vitrified Polymer Composite (VPC) cast-in-place detectable/tactile warning surface tiles complying with Americans with Disabilities Act (ADA) and the California Code of Regulations (CCR) Title 24, Part 2, Chapter 11B; "Armor-Tile", "Access Tile Tactile Systems," or equal.
 - 1. Color: Shall be yellow and approximate 33538 of GSA/SAE AMS-STD-595A in accordance with CBC Section 11B-705.1.1.3.1.
- I. Traffic Paint for Accessibility Striping at Stairs: VOC compliant, water-based, vinyl acrylic copolymer fast drying emulsion and specifically formulated as a traffic marking paint; "Setfast" with "Duckback" abrasive additive by Sherwin-Williams, "SAFE-STRIDE" by Wooster Products, Inc., or equal.
 - 1. Colors: As selected by Architect. [Yellow]
- J. Cast Abrasive Accessibility Strips and Stairs: Extruded aluminum with integral anchor and filled with abrasive granules in epoxy binder; Model ST-SF-N by Nystrom, Inc., 800-547-2635, Type T-24 by American Safety Tread Company, Inc., 800-245-4881, Type WP-24A by Wooster Products, Inc., 330-264-2844, or equal.
 - 1. Colors: As selected by Architect. [Yellow]

2.8 CONCRETE DESIGN AND CLASS

- A. Designed Strength and Classes of Concrete: The following mixes are not applicable to concrete items exceeding 4 feet in height above the adjacent grade.
 - 1. Class "B": Concrete shall have 1 inch maximum size aggregate, shall have 3000 pounds per square inch minimum at 28 day strength with a maximum water to cementitious ratio no greater than 0.50.
 - a. Location of Use: Exterior slabs, including walks, vehicular paved surfaces, manhole bases, poured-in-place drop inlets, curbs, valley gutters, curb and gutter, and other concrete of like nature.
 - 2. Class "D" concrete of 1 inch maximum size aggregate shall have 3500 pounds per square inch 28 day strength with a maximum water to cementitious materials ratio of 0.55.
 - a. Location of Use: Footings and retaining walls not attached to buildings, and planter walls, monument signs, and other site concrete not described for use in Class "B".
- B. Slump Limits: Provide concrete, at point of final discharge of proper consistency as tested in accordance with ASTM C143/C143M with slumps of 4 inches, plus or minus 1 inch.
- C. Mix Design: Concrete shall be designed for strength in accordance with provisions of CBC Section 1905A.

1. Should the Contractor desire to pump concrete, a modified mix design will need to be submitted for review.
 2. Fly ash may be used in concrete to improve workability in amounts up to 15 percent of the total cementitious weight.
- D. Air Entrainment: Provide at concrete paving / flatwork, including concrete ramps and stairs in accordance with local jurisdiction minimum requirements, but no less than 3 percent of the volume of concrete.
- E. Glare Reduction Additive:
1. General:
 - a. Provide at exterior concrete slabs, walks, ramps, stairs, including bleachers, and other exposed flatwork to eliminate glare.
 - b. Omit glare reduction colorant where color hardener, integral color, and stain treatment of concrete are scheduled.
 2. Quantity: As required to match approved sample but not exceed 2 pounds of colorant per cubic yard of concrete.
 3. Add colorant to mix in accordance with manufacturer's printed instructions.
- F. Coloring Agent:
1. Quantity: Add pigment as required to result in hardened concrete color consistent with approved sample but not exceeding maximum dosage per sack of cement as recommended by manufacturer based on total cementitious materials of mix design.
 2. Add pre-mixed colorant bags to mix in accordance with manufacturer's printed instructions.

2.9 MIXING OF CONCRETE

- A. Conform to requirements of CBC Chapter 19A.
- B. Concrete shall be mixed until there is uniform distribution of material and mass is uniform and homogenous; mixer must be discharged completely before the mixer is recharged.
- C. Concrete shall be Ready-Mixed Concrete: Mix and deliver in accordance with the requirements set forth in ASTM C94/C94M and ACI 301. Batch Plant inspection may be waived in accordance with CBC Section 1705A.3.3, when approved by the Project Engineer and DSA.
1. Furnish batch certificates for each batch discharged and used in the work.
 2. Approved Testing Laboratory shall check the first batching at the start of the work and furnish mix proportions to the Licensed Weighmaster.
 3. Licensed Weighmaster shall identify materials as to quantity and to certify to each load by ticket.
 4. Delivery tickets are to accompany each truck and shall be kept in the job superintendent's file. Delivery tickets must indicate the following information or be subject to rejection:

- a. Name of Project.
 - b. Supplier of concrete.
 - c. Truck identity and ticket serial number.
 - d. Date of delivery.
 - e. Brand of cement.
 - f. Cement content.
 - g. Strength classification.
 - h. Batching time.
 - i. Point of deposit.
 - j. Total amount of water.
 - k. Weight of aggregate.
 - l. Daily temperature.
 - m. Number of cubic yards in load.
 - n. Admixture content.
 - o. Name of Contractor.
 - p. Name of driver.
 - q. Time loaded and first mixing of concrete.
 - r. Reading of revolution counter.
 - s. Color additive.
5. Ticket shall be transmitted to Project Inspector by truck driver with load identified thereon. Project Inspector will not accept load without load ticket identifying mix and will keep daily record of pours, identifying each truck, its load and time of receipt, and will transmit two copies of record to DSA.
6. At end of project, Weighmaster shall furnish affidavit to DSA on form satisfactory to DSA, certifying that all concrete furnished is in conformance with proportions established by mix designs.
7. Placement of concrete shall occur as rapidly as possible after batching and in a manner which will assure that the required quality of the concrete is maintained. In no case may concrete be placed more than 90 minutes from batch time.
- a. When air temperature is between 85 and 90 degrees F, reduce maximum batching to discharge time from 90 minutes to 75 minutes.
 - b. When air temperature is above 90 degrees F, reduce maximum batching to discharge time to 60 minutes.
8. Water may be added to the mix only if neither the maximum permissible water-cement ratio nor the maximum slump is exceeded.
- a. The quantity of water used for each batch shall be accurately measured.
 - b. In no case shall more than 10 gallons of water be added to a full 9-yard load, or 1 gallon per yard on remaining concrete within the drum, providing load tag indicates at time of mixing at plant an allowance for additional water.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Confirm general layout, grade, and joint pattern layout with the Architect prior to placing concrete.
- B. Verify that gradients and elevations of the base are correct, and that the base is dry.
- C. Contractor shall report in writing to the Architect prevailing conditions that will adversely affect satisfactory execution of the work of this Section.
 - 1. Do not proceed with work until unsatisfactory conditions have been corrected.
- D. Forms and reinforcements are subject to approval by the Project Inspector as specified in Article FIELD QUALITY CONTROL.

3.2 PREPARATION

- A. Remove frost, water, and other foreign materials from form surfaces, reinforcement, and embedded items against which concrete will be placed.
- B. When the ambient temperature necessitates the use of cold or hot weather concreting, make provisions in advance of concrete placement.
- C. Before placing concrete, clean tools and equipment, and remove debris from areas to receive concrete.
- D. Clean reinforcing and other embedded items of coatings, oil, mud and soil that may impair bond with concrete.
- E. Slab-On-Grade: After subgrade has been approved by Geotechnical Engineer, install specified drainage rock base material to thickness shown. Rock base shall be implemented and compacted in accordance with the Geotechnical Report and recommendations of the Geotechnical Engineer.

3.3 INSTALLATION – FORMWORK

- A. Form material shall be straight, true, sound and able to withstand deformation due to loading and effects of moist curing. Materials which have warped or delaminated, or require more than minor patching of contact surfaces, shall not be reused.
- B. Build forms to shapes, lines, grades and dimensions indicated. Construct formwork to maintain tolerances required by ACI 301. Forms shall be substantial, tight to prevent leakage of concrete, and properly braced and tied together to maintain position and shape. Butt joints tightly and locate on solid backing. Chamfer corners where indicated. Form bevels, grooves and recesses to neat, straight lines. Construct forms for easy removal without hammering, wedging or prying against concrete.
- C. Space clamps, ties, hangers and other form accessories so that working capacities are not exceeded by loads imposed from concrete or concreting operations.

- D. Build openings into vertical forms at regular intervals if necessary to facilitate concrete placement, and at bottoms of forms to permit cleaning and inspection.
- E. Build in securely braced temporary bulkheads, keyed as required, at planned locations of construction joints.
- F. Before placement of reinforcing steel, coat faces of all forms to prevent absorption of moisture from concrete and to facilitate removal of forms. Apply specified material in conformance with manufacturer's written directions.
 - 1. Seal all cut edges.
 - 2. Before re-using form material, inspect, clean thoroughly, and recoat.
- G. Slope tie-wires downward to outside of wall.
- H. Brace, anchor and support all cast-in items to prevent displacement or distortion.
- I. During and immediately after concrete placing, tighten forms, posts and shores. Readjust to maintain grades, levels and camber.
- J. Concrete Paving, Curbs, Curb and Gutters, Ramps:
 - 1. Expansion Joints: Install at locations indicated, and so that maximum distance between joints is 20 feet for exterior concrete unless otherwise shown. Expansion joint material shall be full depth of concrete section. Recess for snap cap and sealant when required.
 - 2. Curbs, Valley Gutter, and Curb & Gutter: Install expansion joints at 60 feet on center, except when placing adjacent to concrete walks, the expansion joints shall align with the expansion joints shown for the concrete walks. Expansion joint material shall be full depth of concrete section. Recess for snap cap and sealant when required.
 - 3. Isolation Joints: 3/8-inch felt between walls and exterior slabs or walks so that paved areas are isolated from all vertical features, unless specifically noted otherwise on plans.
 - 4. Exterior Concrete Paving: Install expansion joints at 20 feet on center maximum, both directions, unless shown otherwise on plans.
 - 5. Ramps: Whether shown or not, all ramps shall have control joints and expansion joints.
 - a. Control joints on ramps shall be aligned and placed in between the vertical posts for the handrails. The curbs, if required shall have control joints that align with the handrail posts.
 - b. Expansion joints shall be placed at the upper, intermediate, and bottom landings.
- K. Inspection: Refer to Article FIELD QUALITY CONTROL.

3.4 INSTALLATION – REINFORCING

- A. General: Reinforcing shall be accurately placed at locations indicated on the drawings within required tolerances and providing required clearances. Reinforcement shall be

secured prior to placement of concrete such that tolerances and clearances are maintained. Coverage shall be in accordance with Section 1907A.7 of the CBC.

1. Reinforcement must be in place before concreting is begun.
 2. Keep a person on the job to maintain position of reinforcing as concrete is placed.
 3. All expansion and construction joints in concrete shall have dowels of size and spacing as shown on the Drawings, or as approved by Architect.
 4. Give notice whenever pipes, conduits, sleeves, and other construction interferes with placement; obtain method of procedure to resolve interferences.
- B. Additional reinforcing steel shall be placed around all utility boxes, valve boxes, manhole frames and covers that are located within the concrete placements.
1. The bars shall be placed so that there will be a minimum of 1-1/2-inch clearance and a maximum of 3-inch clearance. The reinforcing steel shall be placed mid-depth of concrete slab.
- C. At right angles or intersections of concrete walks, additional 2 feet x 2 feet #5, 90 degree bars shall be added at all inside corners for additional crack control. The bars shall be placed 2 inches from concrete forms and supports, at mid-depth of slab.
- D. Reinforcing steel shall be adequately supported by approved devices on centers close enough to prevent any sagging.
- E. Placing Tolerances:
1. In accordance with ACI 301 or CRSI/WCRSI Recommended Practice for Placing Reinforcing Bars, unless otherwise shown.
 2. Clear distance between parallel bars in a layer shall be no less than 1 inch, the maximum bar diameter shall not exceed 1-1/2 times the maximum size of coarse aggregate.
- F. Splices:
1. General: Unless otherwise shown on drawings, splice top reinforcing at midspan between supports, splice bottom reinforcing at supports, and stagger splices. Bar laps shall be wired together. Reinforcing steel laps shall be as follows:
 - a. Length of Lap Splices in Concrete:
 - 1) No. 4 bar: 24 inches minimum.
 - 2) No. 5 Bar: Not less than 62 bar diameters.
 - 3) No. 6 Bar: 56 inches minimum.
 - 4) No. 7 Bars and Larger: Not less than 93 bar diameters.
 - b. All splices shall be staggered at 5 feet minimum from adjacent splices.
- G. Inspection: Refer to Article FIELD QUALITY CONTROL.

3.5 PLACING OF CONCRETE – GENERAL

- A. Adjacent finish surfaces shall be protected at all times during the concrete pour and finishing. Verify that all formwork is tight and leak-proof before concrete is poured. Finish work defaced during the concrete pour and finishing shall be replaced at no extra cost to Owner.
- B. Remove wood chips, sawdust, dirt, loose concrete and other debris just before concrete is to be poured. Use compressed air for inaccessible areas. Remove all standing water from excavations.
- C. Transport concrete from mixer to place of final deposit as rapidly as practicable by methods which will prevent separation or loss of ingredients. Deposit as close as practicable in final position to avoid re-handling or flowing. Partially hardened concrete must not be deposited in work. Concrete shall not be wheeled directly on top of reinforcing steel.
- D. Keep excavations free of standing water, but moisture condition sub-grade before concrete placement.
- E. Placing: Once started, continue concrete pour continuously until section is complete between predetermined construction joints. Prevent splashing of concrete onto adjacent forms or reinforcement and remove such accumulation of hardened or partially hardened concrete from forms or reinforcement before work proceeds in that area. Free fall of concrete shall not to exceed 4'-0" in height. If necessary, provide lower openings in forms to inject concrete and to reduce fall height.
- F. Remove form spreaders as placing of concrete progresses.
- G. Place footings as monolithic and in one continuous pour.
- H. Compacting: Concrete shall be compacted by mechanical vibrators.
 - 1. Concrete shall be thoroughly worked around reinforcement and embedded fixtures and into corners of forms.
 - 2. Vibrating shall not be applied to concrete which has already begun to initially set or be continued so long as to cause segregation of materials.

3.6 REMOVAL OF FORMS

- A. Remove without damage to concrete surfaces.
 - 1. Sequence and timing of form removal shall insure complete safety of concrete structure.
 - 2. Forms shall remain in place for not less than the following periods of time. These periods represent cumulative number of days during which temperature of air in contact with concrete is 60 degrees F and above.
 - a. Vertical Forms of Foundations, Walls and All Other Forms Not Covered Below: 5 days.
 - b. Concrete Paving Edge Screeds or Forms: 7 days.

3. Concrete shall not be subjected to superimposed loads (structure or construction equipment) until it has attained its full design strength and not for a period of at least 21 days after placing. Concrete systems shall not be subjected to construction loads in excess of design loads.
- B. Patching: Install specified patching mortar per manufacturer's recommendations. Repairs to defective concrete which affect the strength of any structural concrete member or component are subject to approval by the architect and DSA.

3.7 CONCRETE PAVING

- A. Concrete paving shall be formed and finished to required line and grades true and flat with a maximum tolerance of 1/8-inch in 10 feet for flatness and to slopes indicated.
- B. Concrete vibrator shall be used to assist concrete placement. Contractor shall have spare concrete vibrator on site during concrete placement.
- C. Thoroughly water and soak the subgrade of exterior concrete paving, curbs, curb and gutters, with multiple daily waterings for at least three days or as required to achieve required moisture content prior to the concrete pour in order to place the subgrade soils in full expansion.
 1. Provide damming as required to keep standing water within the formed area and to allow for proper saturation and full expansion of the subgrade soils.
 2. Remove standing water before concrete placement.
- D. Construction Joints:
 1. Keep exposed concrete face of construction joints continuously moist from time of initial set until placing of concrete; thoroughly clean contact surface by chipping entire surface not earlier than 5 days after initial pour to expose clean hard aggregate solidly embedded, or by approved method that will assure equal bond, such as green cutting.
 2. If contact surface becomes contaminated with soil, sawdust or other foreign matter, clean entire surface and re-chip entire surface to assure proper adhesion.

3.8 FINISHING

- A. Concrete Paving: Finish surface as required by ACI 302.1R using manual and vibrating screeds to place concrete level and smooth.
 1. Under no circumstances shall water be added to the top surface of freshly placed concrete.
 2. Use "jitterbugs" or other special tools designed for the purpose of forcing the course aggregate below the surface leaving a thick layer of mortar 1 inch in thickness.
 3. After tamping the concrete, wood float surface to a true and even plane.
 4. After floating with a wood bull float, make 2 passes with a steel Fresno trowel to start sealing the concrete surface.

5. While concrete is still wet but sufficiently hardened to bear a persons' weight on knee boards, start troweling with a steel hand trowel or a machine trowel in larger areas. Use sufficient pressure to bring moisture to surface.
 6. After surface moisture has disappeared, finish concrete utilizing steel, hand or power trowel.
 7. Completed surface shall be free from trowel marks, depressions, ridges or other blemishes. Tolerance for flatness shall be 1/8-inch in 10 feet.
 8. Provide final finish as follows, unless otherwise indicated:
 - a. Medium Broom Finish: Typical finish to be used at all exterior walks, stairs and ramps. Brooming direction shall run perpendicular to slope to form non-slip surface.
- B. Curb Finish: Steel trowel.
- C. Joints and Edges:
1. Mark-off exposed joints, where indicated, with 1/4-inch radius x 1 inch deep jointer or edging tool. Joints shall be clean, cut straight and parallel or square with respect to concrete walk edge.
 2. Tool edges of control joints, walk edges, and wherever concrete walk adjoins other material or vertical surfaces. Expansion joints shall be constructed as detailed on plans.
 3. The expansion joints shall be full depth as shown in the Drawings. Failure to do so will result in non-compliance and shall be immediately machine cut by the Contractor at its expense.

3.9 CURING

- A. Formed Concrete:
1. Keep forms and top on concrete between forms continuously wet until removal of forms, 7 days minimum.
 2. Maintain exposed concrete in a continuous wet condition for 14 days following removal of forms.
- B. Concrete Paving, Curb, Curb and Gutter, Valley Gutter:
1. Cure utilizing curing compound. If applicable, the Contractor shall verify that the approved curing compound is compatible with the approved colorant system.
 2. Curing compound shall be applied in a wet puddling application. Spotty applications shall be reason for rejection and possibly concrete removal and replacement at the contractor's expense with no compensation from the Owner.
- C. No curing compound shall be applied to areas scheduled to receive resilient track surface including, curbs, ramps, runways, and similar items.

3.10 DEFECTIVE CONCRETE

- A. General:

1. Determination of defective concrete shall be made by the Architect or Engineer whose opinion shall be final in identifying areas to be replaced, repaired or patched.
2. As directed by Architect, cut out and replace defective concrete.
 - a. Defective concrete shall be removed from the site.
 - b. No patching is to be done until surfaces have been examined by Architect and permission to begin patching has been provided.
 - c. Permission to patch an area shall not be considered waiver of right by the Owner to require removal of defective work, if patching does not, in opinion of Architect, satisfactorily restore quality and appearance of surface.
 - d. Remove and replace concrete if repair to an acceptable condition is not feasible.

B. Defective Concrete Is:

1. Concrete that does not match the approved mix design for the given installation type.
2. Concrete not meeting specified 28-day strength.
3. Concrete which contains rock pockets, voids, spalls, transverse cracks, exposed reinforcing, or other such defects which adversely affect strength, durability or appearance.
4. Concrete which is incorrectly formed, out of alignment or not plumb or level, or outside of the maximum tolerance for flatness and slopes indicated.
5. Concrete containing embedded wood or debris.
6. Concrete having large or excessive patched voids which were not completed under Architect's direction.
7. Concrete not containing required embedded items.
8. Concrete with excessive shrinkage, transverse cracking, crazing, curling; or defective finish.
9. Concrete that is unsuitable for placement or has set in truck drum for longer than 90 minutes from the time it was batched.
10. Concrete where expansion joint filler that is not isolating the full depth of the concrete section, and not recessed as required for backer rod and sealant where required.
11. Concrete that is excessively wet or excessively dry and will not meet the minimum or maximum slump required per mix design.
12. Finished concrete with oil stains from equipment use, and or rust spots that cannot be removed.
13. Concrete with control joints (weakened planed joints) that do not meet the required minimum depth shown on the drawings.
14. Concrete not meeting slip-resistance requirements.

C. Flatwork: The Owner reserves the right to survey the flatwork, to determine if flatwork is outside of the maximum tolerance for flatness and slopes as indicated.

1. If the flatwork is found to be out of tolerance, then the Contractor is required to replace concrete at no additional expense to the Owner.
2. Determination of flatwork flatness, surveying and remedial work must be completed far enough in advance so that the project schedule is maintained, delays are avoided, and the new flatwork or flatwork repairs are properly cured.
3. The Contractor will be responsible for reimbursing the Owner for costs associated with re-surveying to verify compliance of work remediated by the Contractor.

3.11 SEALANT

- A. Apply sealant in compliance with manufacturer's instructions, using hand guns or pressure equipment with proper nozzle size, on clean, dry, properly prepared substrates.
- B. Force sealants into joint against sides of joint to make uniform. Avoid pulling of the sealant from the sides. Fill sealant space completely with sealant.
- C. Finished joints shall be straight, uniform, smooth, and neatly finished.
- D. Remove any excess sealant from adjacent surfaces of joints utilizing the manufacturer's recommended solvent and cleaning processes. Leave the work in a neat, clean condition.

3.12 FIELD QUALITY CONTROL

- A. Inspection of Forms and Reinforcing:
 1. Approval of forms and reinforcing steel must be received from Project Inspector prior to pouring concrete.
 2. Notice of readiness to place first pour shall be given to Project Inspector, DSA, Architect, and Engineer not less than 48 hours prior to placement of concrete to allow for inspection.
 3. Pouring of concrete shall not proceed prior to completing requested adjustments to forms and reinforcing and without approval of Project Inspector.
- B. Testing of Concrete:
 1. Frequency and Samples for Testing:
 - a. Four identical cylinder samples for strength tests of each class of concrete placed each day shall be taken not less than once a day, or not less than once for each 50 cubic yards of concrete, or not less than once for each 2,000 square feet of surface area for slabs or walls.
 - b. In addition, samples for strength tests for each class of concrete shall be taken for seven-day tests at the beginning of the concrete work or whenever the mix or aggregate is changed.
 2. Testing:
 - a. Slump: Each truck's concrete shall be tested for slump before concrete is placed.
 - b. Strength:

- 1) Tests for strength will be conducted by Testing Agency on one cylinder at 7 days and two cylinders at 28 days. The fourth remaining cylinder will be available for testing at 56 days if the 28-day cylinder test results do not meet the required design strength.
 - 2) On a given project, if the total volume of concrete is such that the frequency of specified testing would provide less than five strength tests for a given class of concrete, tests shall be made from at least five randomly selected batches or from each batch if fewer than five batches are used.
- C. Slip-Resistance Testing: Owner's Testing Agency will perform testing on flatwork to verify compliance with specified slip-resistance.
1. The coefficient of friction will be measured by California Test 342 before pavement is opened to public traffic, but not sooner than 7 days after concrete placement
 2. Where paving is determined to have a coefficient of friction less than 0.30, Contractor is to repair and/or replace these surfaces at no cost to Owner.

3.13 CLEANING

- A. Upon completion of work of this Section promptly remove from the working area all scraps, debris and surplus material of this Section.
- B. Clean excess material from surface of all concrete walks and utility structures.
- C. Power wash concrete surfaces to remove stains, dried mud, tire marks, and rust spots.
- D. Comply with any additional requirements of additive manufacturer for colored concrete.

3.14 PROTECTION

- A. Graffiti-resistant Coating:
 1. Surface Preparation: Prepare concrete surface to receive graffiti-resistant coating specified in Section 09 9623, Graffiti-Resistant Coatings, where indicated.
 2. Concrete must be clean, dry, and free of efflorescence and dust.
- B. Protect work and materials of this Section prior to and during installation, and protect the installed work and materials of other trades.
- C. In the event of damage during construction, make all repairs and replacements necessary to the approval of the Architect, at no additional cost to the Owner.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Chain link fences
 - 2. Gates and gate hardware.

1.2 RELATED REQUIREMENTS

- A. Section 01 6116, Volatile Organic Compound (VOC) Restrictions, for VOC limits pertaining to adhesives, sealants, fillers, primers, and coatings.
- B. Section 01 8113, Sustainable Design Requirements, for CAL-Green general requirements and procedures.
- C. Section 32 1600, Site Concrete.
- D. Section 08 7100, Door Hardware, for padlocks.

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CAL Green), edition as noted on the drawings, as adopted by the California Division of the State Architect (DSA).
- C. Chain Link Fence Manufacturers' Institute (CLFMI):
 - 1. Products Manual.
- D. ASTM International (ASTM):
 - 1. A153: Zinc Coating (Hot Dip) on Iron and Steel Products.
 - 2. A392: Zinc Coated Steel Chain Link Fence Fabric.
 - 3. A653/A653M: Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
 - 4. A780/A 780M: Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings.
 - 5. C33/C33M: Standard Specification for Concrete Aggregates.
 - 6. C94: Ready-mixed Concrete.
 - 7. C150/C150M: Standard Specification for Portland Cement.
 - 8. F668: Poly Vinyl Chloride (PVC) Coated Steel Chain Link Fence Fabric.
 - 9. F934: Standard Colors for Poly Vinyl Chloride (PVC) Coated Chain Link.
 - 10. F969: Standard Practice for Construction of Chain-Link Tennis Court Fence.

CHAIN LINK FENCES AND GATES

SECTION 32 3113

3595001

11. F1083: Pipe, Steel, Hot-Dipped Zinc Coated (Galvanized) Welded, for Fence Structures.

1.4 ADMINISTRATIVE REQUIREMENTS

A. Submittal Procedures:

1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
3. Sustainable Design Submittals shall comply with the additional requirement of Section 01 8113, Sustainable Design Requirements.

1.5 ACTION SUBMITTALS

- A. Shop Drawings: Submit showing all parts, connections and anchorages, adjacent materials, fully dimensioned and noted. Indicate plan layout, spacing of components, post foundation dimensions, hardware anchorage and schedule of components.
- B. Products Data: Submit list and complete descriptive data of all products proposed for use. Include manufacturer's specifications, published warranty or guarantee, installation instructions, and maintenance instructions.
- C. Samples:
1. Chain-link fabric, approximately 12 inches square, in selected color.
 2. Hardware and fittings if requested by Architect.

1.6 INFORMATIONAL SUBMITTALS

- A. Sample of manufacturer's warranty.
- B. Sustainable Design:
1. General:
 - a. Submit information necessary to establish and document compliance with the California Green Building Standards Code.
 - b. Sustainable design submittals are in addition to other submittals.
 2. The following information shall be provided:
 - a. Paints and Coatings: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.

1.7 CLOSEOUT SUBMITTALS

- A. Warranty/Guarantee: Submit executed warranty and Subcontractor's guarantee.

1.8 QUALITY ASSURANCE

- A. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.
- B. Use materials and products of one manufacturer whenever possible.
- C. All materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.

1.9 DELIVERY, STORAGE AND HANDLING

- A. Deliver undamaged products to job in manufacturer's sealed containers and/or original bundles with tags and labels intact.
- B. Store materials in protected, dry conditions off of ground and in areas so as to not interfere with the progress of the work.
- C. Transport, store and handle in strict accord with the manufacturer's written recommendations.

1.10 FIELD CONDITIONS

- A. Make and be responsible for all field dimensions necessary for proper fitting and completion of work. Report discrepancies to Architect before proceeding.

1.11 WARRANTY

- A. Manufacturer: In addition to the Contractor's and Subcontractor's Guarantee, furnish Owner with manufacturer's fully executed written warranty for chain link fencing against defects in materials and workmanship, including the following:
 - 1. Windscreen: 3 years.

PART 2 - PRODUCTS

2.1 DESIGN AND PERFORMANCE CRITERIA

- A. Industry Standards: Materials and installation shall conform to the requirements of the Chain Link Fence Manufacturers Institute (CLFMI) "Product Manual."
- B. Regulatory Requirements: Pedestrian gates and related hardware shall comply with applicable codes, including provisions for accessibility required by CBC and the Americans with Disabilities Act "Designs for Accessible Design." Comply with the most stringent.
- C. Use new components **[,except existing fence indicated to be relocated,]** free from defects affecting service and appearance.
- D. Sizes specified or shown are minimum.

CHAIN LINK FENCES AND GATES

SECTION 32 3113

3595001

- E. Provide ferrous material except as otherwise indicated or specified.
- F. Sustainable Design:
 - 1. VOC emissions for field-applied paints and coatings must comply with limits specified in Section 01 6116.

2.2 WORKMANSHIP

- A. Galvanizing: Hot dip galvanize ferrous materials after fabrication. Repair zinc coating damaged in shop or during field erection by re-coating with hot repair compound, Re Galv, Galvalloy, Galveweld-alloy, or equal, applied in accord with manufacturer's recommendations.

2.3 MATERIALS

- A. Vinyl Coated Chain Link Fabric: Steel wire with no less than 1.20 ounce of zinc coating per square foot of surface area, covered with color coating of polyvinyl chloride no less than 15 mils thick fusion method with breaking strength of 1200 pounds (Class 2b), and complying with ASTM F668.
 - 1. Typical:
 - a. Wire Diameter: 9 gage, coated size.
 - b. Mesh Opening: 2 inches.
 - 2. Edges: Knuckle fabric at bottom and at top selvage.
 - 3. Fabric widths shall be one piece.
 - 4. Color of PVC Coating: In compliance with ASTM F934, black.
- B. Security Fabric: 16 gauge galvanized sheet metal in conformance with ASTM A653/A653M, 1.3 pounds per square foot, with round hole perforations; McNichols item number 1431141638 as specified and the basis of design, or equal.
 - 1. Perforations shall be 3/16" holes on a 1/4" stagger.
 - 2. Open Area: 51 percent.
 - 3. Finish: Prime and paint as specified in Section 09 9100, Painting, prior to installation.
- C. Security Fabric U-Edging: 14 gauge. galvanized hot rolled U shaped edging, 1 inch tall face x 3/8 inch opening width; McNichols quality U-Edging, item number 4003801410 as specified and the basis of design, or equal.
- D. Round Steel Pipe Fence Framework:
 - 1. Round steel pipe and rail, Schedule 40 standard weight pipe, in accordance with ASTM F1083, 1.8 oz/sq. ft (550 g/sq. m) hot dip galvanized zinc exterior and 1.8 oz/sq. ft (550 g/sq. m) hot dip galvanized zinc interior coating.
 - a. Regular Grade: Minimum steel yield strength 30,000 psi (205 MPa)
 - b. High Strength Grade: Minimum yield strength 50,000 psi (344 MPa)

- E. Line Posts:
 - 1. Without Slats or Windscreen: Regular Grade.
 - a. To 8'-0" High Maximum: 2-3/8 inch outside diameter pipe at 3.65 pounds per linear foot.
- F. End, Corner and Pull Posts: End, corner and pull posts shall also comply with gate post requirements, where occurs.
 - 1. Without Slats or Windscreen: Regular Strength.
 - a. To 8'-0" High Maximum: 2-7/8 inch outside diameter pipe at 5.79 pounds per linear foot.
- G. Gate Posts, Single Leaf: Gate posts shall also comply with End, Corner and Pull Post requirements.
 - 1. To 6 Feet Wide: 2-7/8 inch outside diameter pipe at 5.79 pounds per linear foot.
- H. Post caps: Cast or malleable iron ball or acorn shape; with opening for top rail.
- I. Top Rail, Bottom Rails, and Braces: 1-5/8" outside diameter pipe at 2.27 pounds per linear foot., or 1-5/8 inch x 1-1/4 inch roll formed section, 14 gauge.
 - 1. Brace Assembly:
 - a. Equally spaced between top rail and bottom fabric selvage and run from end, gate, or corner post to first line posts with suitable malleable iron fittings.
 - b. Truss from line post to end, gate, or corner post with 3/8 inch round rod.
- J. Coating for Fencing Components, Including Posts: Polyester powder coating, 3 to 4 mils thick, applied by the electrostatic spray process and baked at 450-500 degrees until cured; with 55 to 70 gloss.
 - 1. Color: Black.
- K. Bands: 14 gauge x 1 inch wide steel spaced 15 inches on center. for securing stretcher bars to end and gate posts.
 - 1. Bands may be used in conjunction with special fitting for securing rails to end and gate posts.
 - 2. Chamfer to ease projecting edges of bands.

2.4 GATES

- A. Frames:
 - 1. Gate Leaves to 6 Feet Wide: 1-5/8 inch outside diameter pipe at 2.27 pounds per linear foot.
 - 2. Gate Leaves Over 6 Feet Wide: 2 inch outside diameter pipe at 2.72 pounds per linear foot.

CHAIN LINK FENCES AND GATES

SECTION 32 3113

3595001

3. Provide additional horizontal and vertical pipe or tube as necessary to assure proper gate operation and attachment of fabric and hardware.
- B. Diagonal Bracing: Provide adjustable length 3/8 inch truss rods on non-welded gate frames and welded gate frames where corner rigidity is insufficient to insure no sag.
- C. Fabric: As specified for fence.
- D. Gate Assembly:
 1. Weld or assemble gate frame with malleable or pressed steel fittings and rivets to provide rigid connections.
 2. Install fabric with stretcher bars at vertical edges, which may also be used at top and bottom edges.
 3. Securely attach stretcher bars and fabric to frame on all sides at 15 inches on center.
 4. Attach hardware with rivets or by other means which will provide security against removal.
- E. Gate Hardware:
 1. General: Hardware at disabled accessible gates shall meet accessibility, including mounting, of the ADA and CBC. Comply with the most stringent.
 2. Hinges: Malleable iron, pressed or forged steel, non-liftoff type, easy noiseless operation and long wear, offset to permit 180 degree gate opening.
 - a. Provide 1-1/2 pair hinges for each leaf over 6 feet nominal height.
 - b. Ball and socket hinges not acceptable.
 3. Fork Latch: Malleable iron, drop fork latch which permits operation of the gate from either side, with padlock eye provided as integral part of latch.
 4. Panic / Lever Hardware: At gates to receive panic hardware or lever locksets, provide galvanized iron lockset boxes, backing plates or mounting plates as required for permanent, vandal resistant mounting.
 5. Kick Plates: 10 inches tall x width of gate x 14 gauge minimum, smooth uninterrupted surfaced, galvanized steel.
 - a. Mount on the bottom edge of gate at the push side. Mount on both sides at two-way swing gates.
 - b. Bottom edge of plate shall be not more than 3 inches above the top of the walk.
 - c. Plate shall be welded to the fence frame and shall allow the gate to be opened by a wheelchair footrest without creating a trap or hazardous condition.
 - d. Provide at pedestrian gates that are within the disabled accessible path of travel
 6. Gate Stop and Holder: Malleable iron.
 - a. Stop shall automatically engages gate frame and holds it in open position.
 - b. Provide at vehicle gates.

7. Double Gates: Provide cane bolt and ground set keeper with locking device and padlock eyes designed as integral part of latch, requiring one padlock for locking both leaves.

2.5 ADDITIONAL MATERIALS AND COMPONENTS

- A. Galvanizing Repair: Zinc coating damaged in shop or during field erection shall be by re-coated using a hot repair compound; "Regalv" repair stick by Rotometals, San Leandro, CA, or equal, applied in accordance with manufacturer's recommendations.
- B. Concrete:
 1. Materials:
 - a. Portland cement, ASTM C 150.
 - b. Aggregate: ASTM C33.
 - c. Water: Potable and free from substances harmful to concrete.
 2. Mix materials to obtain low slump concrete with 28 day compressive strength of 2,500 psi.
 - a. Maximum Size Aggregate: 1-1/2 inch.
 - b. Re-tempering not permitted.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. General:
 1. Execute work in accord with best trade practice for industrial fence installations.
 2. Make welds neat and secure, grind off excess exposed metal.
 3. Securely set posts plumb in alignment at proper depth and height, and rigid bracing where needed; install fabric under tension and securely tie to posts, rails and braces.
 4. Gates shall move freely without sag.
- B. Setting Posts:
 1. General: Space posts as indicated but not more than 10 feet on center.
 2. Pour and tamp concrete leaving no voids.
 - a. Check posts for vertical and top alignment and hold in position.
 - b. Dome top of concrete and trowel smooth to shed water away from post.
 - c. Align posts in footings as follows:
 3. Without Slats or Windscreen: Footings for End, corner and pull posts shall also comply with gate post requirements, where occurs.
 - a. Line Posts to 8'-0" High Maximum: 1'-0" diameter, 3'-3" minimum embedment.

CHAIN LINK FENCES AND GATES

SECTION 32 3113

3595001

- b. End, Corner and Pull Posts to 8'-0" High Maximum: 1'-0" diameter, 4'-3" minimum embedment.
- 4. Single Leaf Gates: Footings for gate posts shall also comply with End, Corner and Pull Post requirements.
 - a. To 6 Feet Wide: 12 inch diameter, 36 inch embedment.
- C. Where posts occur adjacent to structures or other work where concrete foundations may conflict with post footing, block out to allow post installation or use off-set post. Hold post 4 inches clear from face of structure.
- D. Fabric: Leave about 1-1/2 inches between ground and bottom barbs.
 - 1. Pull fabric taut and tie to posts, rails **[and tension wires]**.
 - 2. Install fabric on security side of fence.
 - 3. Fabric shall remain under tension after pulling force is released.
- E. Gates:
 - 1. Install gates plumb, level and secure, with full swing or slide without interference.
 - 2. Install ground set items in substantial concrete mass for adequate anchorage.
- F. Tie Wires:
 - 1. Install with one tight turn to hold fabric firmly to frame.
 - 2. Bend ends of wire inward to prevent hazard to persons or apparel.
- G. Fasteners:
 - 1. Install nuts for tension band and hardware bolts on side of fence opposite fabric side.
 - 2. Spoil ends of bolts to prevent removal of nuts.

3.2 ADJUSTING

- A. Repair exposed zinc coatings damaged in shop or during field erection using specified repair system and in compliance with ASTM A 780,
- B. Adjust gated hardware for smooth operation and lubricate where necessary.

END OF SECTION

*p:\sacramento\3595 tracy unified school district\001-000_villalovoz es new shade structures\08 specifications\06 spec\04 final\hirsch\32 3113_chain link fences and gates.docx
Last Updated: February 25, 2022*

PART 1 - GENERAL

1.1 SUMMARY

A. Scope of Work:

1. Furnish all labor, materials, tools, equipment, and transportation required to perform and complete the installation of an automatic sprinkler irrigation system, including all piping, sprinkler heads, controls, connections, testing, etc. as shown on the Drawings and as specified herein. The water source for this project is potable water.
2. Utilize and accept as standards manufacturer's recommendations and/or installation details for any information not specifically detailed on the Drawings.

1.2 RELATED REQUIREMENTS

- A. Section 01 6116, Volatile Organic Compound (VOC) Restrictions, for VOC limits pertaining to adhesives, sealants, fillers, primers, and coatings.
- B. Section 01 8113, Sustainable Design Requirements, for CAL-Green general requirements and procedures.
- C. Section 31 0000, Earthwork.
- D. Section 31 2333, Trenching and Backfilling.
- E. Section 32 9000, Landscaping.

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CALGreen), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).

1.4 ADMINISTRATIVE REQUIREMENTS

A. Submittal Procedures:

1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
3. Sustainable Design Submittals shall comply with the additional requirements of Section 01 8113, Sustainable Design Requirements

**IRRIGATION
SECTION 32 8000
3595001**

B. Pre-Installation Meeting:

1. Request and hold a pre-installation meeting prior to beginning the work of this Section. Parties required to be in attendance are the Landscape Contractor, Project Inspector, Owner's Representative, and the Landscape Architect.

1.5 ACTION SUBMITTALS

- A. Product names are used as standards; provide proof as to equality of any proposed material and do not use other materials or methods unless approved in writing by the Owner's Representative. Submit no more than one request for substitution for each item. The decision of the Owner's Representative is final.
- B. Use equipment capacities specified herein as the minimum acceptable standards.
- C. List materials in the order in which they appear in Specifications; include substitutions. Submit the list for approval by the Owner's Representative.
- D. Make any mechanical, electrical, or other changes required for installation of any approved, substituted equipment to satisfaction of Owner's Representative and without additional cost to Owner. Approval by Owner's Representative of substituted equipment and/or dimensional drawing does not waive these requirements.
- E. Do not construe approval of material as authorization for any deviations from Specifications unless attention of Owner's Representative has been directed to specified deviations.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data for the following:
 1. For landscape contractor.
- B. Sample of manufacturers' warranty.
- C. Record of Pre-Installation Meeting.
- D. Sustainable Design:
 1. General:
 - a. Submit information necessary to establish and document compliance with the California Green Building Standards Code.
 - b. Sustainable design submittals are in addition to other submittals.
 2. The following information shall be provided:
 - a. Adhesives and Sealants: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.
 - b. Paints and Coatings: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.

1.7 CLOSEOUT SUBMITTALS

- A. Warranty/Guarantee: Submit executed warranty and subcontractor's guarantee.
- B. Maintenance and Operating Instructions:
 - 1. Furnish operating maintenance instructions bound in a hardback binder and indexed. Start compiling data upon approval of list of materials. Do not request final inspection until booklets are approved by Owner's Representative.
 - 2. Incorporate the following information in these sets:
 - a. Complete operating instructions for each item of irrigation equipment.
 - b. Typewritten maintenance instructions for each item of irrigation equipment.
 - c. Manufacturer's bulletins which explain installation, service, replacement parts, and maintenance.
 - d. Service telephone numbers and/or addresses posted in an appropriate place as designated by Owner's Representative.
- C. Record Drawings.

1.8 QUALITY ASSURANCE

- A. Qualifications: Work must be complete by a licensed Landscape Contractor. Provide proof of five years' continuous experience in landscaping and irrigation of projects of similar size.
- B. Certification: Ensure that the contractor installing the Central Control System is trained and certified in the installation of the Central Control System. The training and certification must have been completed within two years prior to the installation date.
- C. Work Force: Ensure that an experienced foreman is present at all times during installation. Keep the same foreman and workers on the job from commencement to completion.
- D. Reviews: Specifically request reviews of all items listed in Article INSPECTION REQUIREMENTS, prior to progressing to the next level of work.
- E. Standards:
 - 1. Provide work and material in full accordance with the rules and regulations of the National Electric Code; the Uniform Plumbing Code; and other applicable state or local laws or regulations.
 - 2. Furnish, without extra charge, additional material and labor required to comply with these rules and regulations, though the work may not be specifically indicated in the Specifications or Drawings.
 - 3. Where the Specification requirements exceed those of the above-mentioned codes and regulations, comply with the requirements in the Specifications.

**IRRIGATION
SECTION 32 8000
3595001**

1.9 DELIVERY, STORAGE AND HANDLING

- A. Transport, store and handle in strict conformance with the manufacturer's written recommendations.
- B. Deliver undamaged products to job in manufacturer's sealed containers and/or original bundles, with tags and labels intact. All material containers or certificates shall be clearly marked by manufacturer as to contents for inspection.
- C. Store materials in original undamaged packages and containers, inside well-ventilated area protected from weather, moisture, soilage, extreme temperatures, and humidity. Lay flat, blocked off ground.
- D. Use all means necessary to protect irrigation system materials before, during, and after installation and to protect related work and material.
- E. Handle plastic pipe carefully, especially protecting it from prolonged exposure to sunlight. Store pipe on beds that are the full length of the pipe, and keep pipe flat.

1.10 FIELD CONDITIONS

- A. Information on Drawings relative to existing conditions is approximate. During progress of construction, make deviations necessary to conform to actual conditions, as approved by Owner's Representative, without additional cost to Owner. Accept responsibility for any damage caused to existing services. Promptly notify Owner's Representative if services are found which are not shown on Drawings.
- B. Protect existing trees-to-remain as specified in "Existing Tree Protection" in Article PREPARATION, in Part 3 of this Section.
- C. Protect existing utilities within construction area. Repair damages to utility lines that occur as a result of operations of this work.
- D. Verify dimensions at building site and check existing conditions before beginning work. Make changes necessary to install work in harmony with other crafts after receiving approval by Owner's Representative.

1.11 INSPECTION REQUIREMENTS

- A. Obtain verification from Project Inspector for the following at the appropriate times during construction and prior to further progression of work in this Section:
 - 1. Pressure testing of all mainlines and lateral lines (See "Hydrostatic Tests – Open Trench" in Article FIELD QUALITY CONTROL, in Part 3 of this Section),
 - 2. Trench depth,
 - 3. Sleeves under pavement,
 - 4. Flushing of all mainlines and lateral lines,
 - 5. Backfill and pipe bedding,

- 6. Layout of heads,
 - 7. Operation of system and coverage adjustments (with Landscape Architect) after system is fully automated and operational, backfill of trenching is completed, and surface has been restored to original grades.
- B. In case of failure to obtain any verification by the Project Inspector as required above, remove and replace work as necessary to obtain the verification at no additional cost to the Owner.

1.12 WARRANTY AND GUARANTEE

- A. Manufacturer: In addition to the Contractor's and Subcontractor's Guarantee, furnish Owner with manufacturer's available fully executed written warranty against defects in materials and workmanship.
- B. Subcontractor Guarantee: Shall include damage by leaks and settlement of irrigation trenches.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Use materials as specified; any deviation from the Specifications must first be approved by the Owner's Representative in writing.

2.2 DESIGN AND PERFORMANCE CRITERIA

- A. Sustainable Design:
 - 1. VOC emissions for field-applied adhesives, sealants, and sealant primers must comply with limits specified in Section 01 6116.
 - 2. VOC emissions for field-applied paints and coatings must comply with limits specified in Section 01 6116.

2.3 MATERIALS

- A. Automatic Control Valves: As indicated on Drawings.
- B. Gate Valve: As indicated on Drawings.
- C. Pipe and Fittings:
 - 1. PVC pipe: As indicated on Drawings.
 - 2. PVC fittings three-inch (3") size and smaller: High impact, standard weight, Schedule 40, molded PVC as manufactured by George Fischer, Lasco, Spears, or approved equal.

IRRIGATION
SECTION 32 8000
3595001

3. PVC fittings four-inch (4") size and larger: High impact, standard weight, Class 200 gasketed, molded PVC as manufactured by George Fischer, Lasco, Spears, or approved equal.
 4. All plastic pipe and fittings: Continuously and permanently marked with manufacturer's name, type of material, IPS size, schedule, NSF approval, and code number.
 5. Threaded PVC pipe and nipples: IPS Schedule 80 when necessary to use threaded connections to gauges, valves, or control valves. Threaded adapters may be used in place of nipples when making pipe to valve connections.
 6. Use 45-degree fittings for changes in depth of pipe, and at transition from main line to automatic control valves.
 7. Piping above ground: Schedule 40 galvanized steel with cast-iron fittings.
- D. PVC Primer: Weld-On P-70 Purple Primer or approved equal.
- E. PVC Glue: Weld-On 711 Gray heavy bodied PVC Cement or approved equal.
- F. Sprinkler Heads: As indicated on Drawings.
- G. Quick Coupler Valves: As indicated on Drawings.
- H. Sleeves: As indicated on Drawings.
- I. All Valve Boxes and Covers: Manufactured, green with "Irrigation – Non-Potable" permanently embossed on cover. Carson, Rainbird or approved equal.
- J. Reduced Pressure Backflow Preventer: As indicated on Drawings.
- K. Automatic Sprinkler Control Wire:
1. Connections between remote control valves and controller: UF-14 direct burial polyethylene (PE) insulated wire, Paige Electric P7079D or approved equal. Common wire to be white, and lead wire to be colored. If multiple controllers are used, a different color is to be used for each controller's lead wire. (Use red for the first controller). Spare wires are to be yellow.
 2. UL Listed waterproof sealing pack for wire connections: 3M DBR/Y-6, or approved equal.
 3. Provide adequate working space around electrical equipment in compliance with local codes and ordinances.
 4. Electrical, other than low voltage, such as power wiring, conduit, fuses, thermal overloads and disconnect switches, is included under Division 26 of these Specifications.
- L. Unions And Flanges:
1. Steel unions and flanges two inches (2") and smaller: 150 lb. screwed black (brass to iron seat) or galvanized malleable iron (ground joint).

2. Steel unions and flanges two and one-half inches (2 ½") and larger: 150 lb. black flange union, flat-faced, full gasket.
 3. Gaskets: One-sixteenth inch (1/16") thick rubber Garlock No. 122, Johns-Manville or approved equal.
 4. Flange Bolts: Open-hearth bolt steel, square heads with cold pressed hexagonal nuts, cadmium plated in ground. Provide copper-plated steel bolts and nuts or brass bolts and nuts for brass flanges.
- M. Sand for Trench Backfill: Natural sand, free of roots, bark, sticks, rags, or other extraneous material

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Prior to commencement of the work of this Section, obtain written verification from the project Civil Engineer that the rough grade in landscape areas is in conformance with Section 31 0000 - Earthwork.
- B. Examine conditions of work in place before beginning work; report defects.

3.2 PREPARATION

- A. Scheduling: Notify the Project Inspector prior to commencing and/or continuing the work of this Section. Remove and replace, at no cost to Owner, any work required as a result of failure to give the appropriate notification.
- B. Measurements: Take field measurements; report variance between plan and field dimensions.
- C. Protection: Maintain warning signs, shoring and barricades as required. Prevent injury to, or defacement of, existing improvements. At no additional cost to Owner, repair or replace items damaged by installation operations.
- D. Existing Tree Protection:
 1. Avoid unnecessary root disturbance, compaction of soils within drip line, or limb breakage.
 2. Do not store material or dispose of any material other than clean water within the drip line.
 3. Provide adequate irrigation during construction.
 4. Replace any tree damaged during construction with a tree of equal size and value at no additional cost to Owner.
 5. Adjust trench locations in field to minimize damage to existing elements and plant roots of trees-to-remain at no additional cost to Owner.

**IRRIGATION
SECTION 32 8000
3595001**

- E. Surface Preparation: Prior to beginning sprinkler irrigation work, complete placement of topsoil as specified in Section 31 0000 – Earthwork. Notify Project Inspector of irregularities if any.

3.3 AUTOMATIC CONTROLLER

- A. Connect automatic control valves to controller(s) in sequence as shown on Drawings.
- B. Install all exposed wires to a minimum of twenty-four inches (24") beyond controller within a UL approved rigid conduit.

3.4 GRADING

- A. Install all irrigation features to their finished grade and at depths indicated. Complete and /or accommodate all rough grading and/or finish grading before commencing with trenching.

3.5 LAYOUT

- A. Lay out work as accurately as possible to Drawings. Drawings are generally diagrammatic to extent that swing joint offsets and fittings are not shown. Record all changes on the Record Drawings.
- B. Do not willfully install the irrigation system as shown on Drawings when it is obvious, in the field, that obstructions or other discrepancies exist which may not have been considered in the design. Notify Owner's Representative of discrepancies before proceeding.

3.6 EXCAVATING AND TRENCHING

- A. General: Perform excavations as required for installation of work included under this Section, including shoring of earth banks to prevent cave-ins. Restore surfaces, existing underground installations, etc., damaged or cut as result of this work to their original condition and in a manner approved by the Landscape Architect.
- B. Width:
 - 1. Make trenches wide enough to allow a minimum of six inches (6") between parallel pipelines and three inches (3") between side of pipe and side of trench. Do not allow stacking of pipe within trench.
 - 2. Allow a minimum clearance of twelve inches (12") in any direction from parallel pipes of other trades.
- C. Preparation of Excavations: Remove rubbish and rocks from trenches. Bed pipe on a minimum of three inches (3") of clean, rock-free soil to provide a firm, uniform bearing for entire length of pipeline. If clean, rock-free soil is not available, use sand for pipe bedding. See Backfill and Compacting for the remainder of the trench backfill.

- D. Minimum depth of cover: Unless shown otherwise, provide the following minimums:
 - 1. Mainline: twenty-four inches (24") cover.
 - 2. Lateral line: twelve inches (12") cover for spray heads, and eighteen inches (18") cover for rotor heads.
- E. Conflicts with other trades:
 - 1. Hand-excavate trenches where potential conflict with other underground utilities exist.
 - 2. Where other utilities interfere with irrigation trenching and piping work, adjust the trench depth as instructed by Owner's Representative.

3.7 BACKFILL AND COMPACTING

- A. General: Do not begin until hydrostatic tests are completed and when system is operating and after required tests and inspections have been made.
- B. Backfill directly around the pipe: Cover pipe with a minimum of three inches (3") of clean, rock-free soil. If clean, rock-free soil is not available, use sand for three inches (3") of backfill above the pipe. The remainder of the trench backfill material can be native soil or material described below. Do not allow wedging or blocking of pipe.
- C. For backfill of trenches under paving areas:
 - 1. See Section 31 0000 – Earthwork for compaction rates and material
 - 2. See Section 31 2333 – Trenching and Backfilling for trench backfill procedure.
- D. For backfill of trenches in landscape areas:
 - 1. Place backfill in six-inch (6") layers and compact with an acceptable mechanical compactor.
 - 2. Compact backfill material in landscape areas to eighty-five percent (85%) maximum dry density of the soil.
 - 3. If settlement occurs along trenches, make adjustments in pipes, valves, and sprinkler heads, soil, sod or paving as necessary to bring the system, soil, sod or paving to the proper level or the permanent grade, without additional cost to the Owner.
- E. Excess Soil: Remove all rocks, debris, and excess soil that results from sprinkler irrigation trenching operations, landscape planting, and soil preparation operations off site at no additional cost to the Owner. If soil meets topsoil requirements in Section 31 0000 – Earthwork, it may be used for finish grading.
- F. Finishing: Dress-off areas to eliminate construction scars.

**IRRIGATION
SECTION 32 8000
3595001**

3.8 CONTROL WIRES

- A. General: Install control wires beneath sprinkler main line whenever possible; tape wires to mainline pipe. Provide one spare wire for each controller.
- B. Slack Wire: Provide eighteen inches (18") of slack wire for each wire connected to automatic control valve. Slack wire shall be coiled and left in the valve box. Tape wires in bundles every ten feet (10'); do not tape wires in sleeves.
- C. Expansion and Contraction: Snake wire in trench to allow for contraction of wire.
- D. Wire Passing Under Existing or Future Paving or Construction: Encase in PVC Schedule 40 or galvanized steel conduit extending at least twelve inches (12") beyond edges of paving or construction.
- E. Wire Connections: Install wire connections in a waterproof sealing pack.
- F. Wire Splicing: Permit splicing only on runs exceeding 500 feet. Locate all splices within valve boxes.
- G. Wire Termination: Install wire in a valve box with eighteen inches (18") of slack wire coiled and individually capped with approved waterproof sealing pack.
- H. Spare Wire: Install two (2) spare wires along each wire path. If there is more than one wire path from the controller, the contractor to install two (2) spare wires per path. Provide eighteen inches (18") of slack wire at each automatic control valve.

3.9 FLUSHING LINES

- A. Thoroughly flush lines prior to installing valves, performing hydrostatic testing, or installing sprinklers. Divert water to prevent washouts.

3.10 AUTOMATIC CONTROL AND QUICK COUPLER VALVES

- A. Install where shown and where practical; place no closer than twelve inches (12") to walk edges, building walls, or fences. Refer to detail for example.
- B. Thoroughly flush mainline before installing valve.
- C. Install valves in ground cover areas where possible.

3.11 PIPING

- A. General: Install in conformance with reference standards, manufacturer's written directions, as shown on Drawings and as herein specified.
- B. Workmanship:
 - 1. General: Install sprinkler irrigation equipment in planted areas throughout the site.
 - 2. Coordination: Organize location of sleeves with other trades as required.

C. Pipe Line Assembly:

1. General:
 - a. Cutting: Cut pipe square; remove rough edges or burrs.
 - b. Solvent-welded Connections: Use materials and methods recommended by the pipe manufacturer.
 - c. Brushes: Use non-synthetic brushes to apply solvents and primer.
 - d. Cleaning: Clean pipe and fittings of dirt, moisture, and debris prior to applying solvent or primer.
 - e. Assembly: Allow pipe to be assembled and welded on the surface or in the trench.
 - f. Expansion and Contraction: Snake pipe from side to side of trench to allow for expansion and contraction.
 - g. Location: Locate pipes as shown on Drawings except where existing supply valves, utilities or obstructions prohibit or where slight changes are approved to better suit field conditions.
2. Flexible Elastometric Seal Joints:
 - a. General: Assemble in strict conformance with the pipe manufacturer's instruction.
 - b. Rubber Rings: Use rubber rings specific for water service systems.
 - c. Cleaning: Thoroughly clean ring and groove of dirt, moisture and debris using a clean, dry cloth. Do not use solvents, lubricants, cleaning fluids or other material for cleaning.
 - d. Seating: Properly seat ring in groove.
 - e. Spigot:
 - 1) General: Clean spigot-end of pipe as in "Cleaning" above prior to applying lubricant recommended by pipe manufacturer.
 - 2) Seating: Insert spigot into bell and seat to full depth required.
3. Connections:
 - a. Threaded Plastic Pipe Connection:
 - 1) Use Teflon tape or pipe joint compound.
 - 2) When assembling to threaded pipe, take up joint no more than one full turn beyond hand-tight.
 - b. Metal Valves and Plastic Pipe: Use threaded plastic male adapters.
 - c. Metal to Metal Connections:
 - 1) Use specific joint compound or gasket material for type of joint made. Where pipe of dissimilar metals are connected, use dielectric fittings.
 - 2) Where assembling, do not allow more than three full threads to show when joint is made up.
 - d. Where assembling soft metal (brass or copper) or plastic pipe, use strap-type friction wrench only; do not use a metal-jawed wrench.
 - e. Threading:

**IRRIGATION
SECTION 32 8000
3595001**

- 1) Do not permit the use of field-threading of plastic pipe or fittings. Use only factory-formed threads.
 - 2) Use factory-made nipples wherever possible. Permit the use of field-cut threads in metallic pipe only where absolutely necessary. When field-threading, cut threads accurately on axis with sharp dies.
 - 3) Use pipe joint compound for all threaded joints. Apply compound to male thread only.
4. Sleeves and conduits:
- a. Use sleeves of adequate size to accommodate retrieval for repair of wiring or piping and extend a minimum of twelve inches (12") beyond edges of walls or paving.
 - b. Provide removable, non-decaying plug at end of sleeve to prevent entrance of soil.
5. Unions: Locate unions for easy removal of equipment or valve.
6. Capping: Plug or seal opening as lines are installed to prevent entrance materials that would obstruct pipe. Leave in place until removal is necessary for completion of installation.

3.12 SPRINKLER HEADS

- A. Sprinkler heads: Locate as shown on the Drawings except where existing conditions prohibit, or slight changes are approved to achieve as good or better coverage under the same conditions. Do not allow sprinkler head spacing to exceed the maximum shown on the Drawings. Plumb heads.
- B. Handling, Assembly of Pipe, Fittings, and Accessories: Allow only skilled tradesmen to handle and assemble pipe, fittings and equipment. Keep interior of pipes, fittings and accessories clean at all times. Close ends of pipe immediately after installation; leave closure in place until removal is necessary for completion of installation. Do not permit bending of pipe.
- C. Flushing: Remove end heads and operate system at full pressure until all rust, scale, and sand is removed. Divert water to prevent ponding or damage to finished work.
- D. Coverage: Accept responsibility for full and complete coverage of irrigated areas to satisfaction of Landscape Architect and make necessary adjustments to better suit field conditions at no additional costs to Owner.

3.13 FIELD QUALITY CONTROL

- A. Visual Inspection: Verify that all pipe is homogenous throughout and free from visual cracks, holes, or foreign materials. Inspect each length of pipe. All materials are subject to impact test at the discretion of the Landscape Architect.

B. Hydrostatic Tests – Open Trench:

1. Center-load piping with a small amount of backfill to prevent arching or slipping under pressure.
2. Request the presence of the Project Inspector in writing at least forty-eight hours in advance of testing.
3. At no additional cost to Owner, test in the presence of the Project Inspector.
4. Apply continuous static water pressure of 100 psi when welded plastic joints have cured at least twenty-four hours, and with the risers capped, as follows: test main lines and submains for four hours; test lateral lines for two hours.
5. Repair leaks resulting from tests; and repeat tests.
6. Test to determine that all sprinkler heads function according to manufacturer's data and give full coverage according to intent of Drawings. Replace any sprinklers not functioning as specified with ones that do, or otherwise correct system to provide satisfactory performance.

C. Continuity Testing: Test locating device and control wires for continuity prior to and after back-filling operations.

3.14 CLEAN-UP

- A. Remove debris resulting from work of this Section.**

3.15 ADJUSTMENTS AND MAINTENANCE

- A. Adjusting System:** Prior to acceptance, satisfactorily adjust and regulate entire system. Set watering schedule on controller appropriate to types of plants and season of year. Adjust remote control valves to operate sprinkler heads at optimum performance based on pressure and simultaneous demands through supply lines.
- B. System Layout:** Provide reduced prints of Record Document irrigation plans, laminated in four (4) mil. plastic, of size to fit controller door. Enlarge remote-control valve designations as necessary for legibility. Color-code areas covered by each station. Affix plans to inside of controller door.
- C. Instructions:** Upon completion of work, instruct maintenance personnel on operation and maintenance procedures for entire system.
- D. Flow Charts:** Record and prepare an accurate flow-rate chart for each automatic control valve.

3.16 RECORD DRAWINGS

- A. As specified in Section 01 3300, Submittal Procedures, and the following:**
1. Regularly update plans of the system and any changes made to the system throughout the project. Record all changes on this plan before trenches are back-filled.

IRRIGATION
SECTION 32 8000
3595001

2. Record complete as-built information and submit the Record Drawings to the Architect before applying for payment for work installed.
3. Show the following on the Record Drawings accurately to scale and dimensioned from two permanent points of reference:
 - a. and spares Distance of mainline from nearby hardscape.
 - b. Location of automatic control valves, quick couplers, and gate valves.
 - c. Location and size of all sleeves.
 - d. Location of automatic control wires.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Soil Preparation and Fertilization
 - 2. Planting
 - 3. Sodding
 - 4. Weed Control
 - 5. Mulch
 - 6. Clean-up
 - 7. Landscape Maintenance Period
- B. Work not included in this Section: Landscape elements such as concrete walks, fencing, outdoor lighting, rough grading, and clearing are not a part of this Section unless shown on the landscape Drawings.

1.2 RELATED REQUIREMENTS

- A. Section 01 8113, Sustainable Design Requirements, for CAL-Green **[and Collaborative for High Performance Schools (CHPS)]** general requirements and procedures.
- B. Section 31 0000, Earthwork.
- C. Section 32 8000, Irrigation

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CALGreen), edition as noted on the drawings, as adopted by the California Division of the State Architect (DSA).
- C. EPA - Federal Insecticide, Fungicide and Rodenticide Act.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Submittal Procedures:
 - 1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.

**LANDSCAPING
SECTION 32 9000
3595001**

2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
- B. Pre-Installation Meeting: Request and hold a pre-installation meeting prior to beginning the work of this Section. Parties required to be in attendance are the Landscape Contractor, Project Inspector, Owner's Representative, and Landscape Architect.
- C. Pre-scheduled On-site Project Meetings: Hold regularly-scheduled (monthly or bimonthly as determined by the Landscape Architect) on-site project meetings with the Landscape Architect, Project Inspector and Owner's Representative. Dates and times will be jointly agreed upon.

1.5 ACTION SUBMITTALS

- A. Plant Material: Within fifteen (15) days after award of contract, locate plant materials required for construction. Ensure that trees and shrubs are contract- grown from a certified nursery. Notify Owner's Representative of plant material "tied off" for review at selected nursery. If specified material is not obtainable, submit the following to Owner's Representative: proof of non-availability, proposal for use of equivalent material, photographs of alternative choices of plant material. Include clear, written description of type, size, condition, and general character of plant material.
- B. Data Sheets:
 1. Provide product data for each type of landscape material indicated in the Drawings and Specifications.
 2. Letter from the manufacturer stating that the soil amendment material submitted for use on this project has no metal fragments or foreign objects.
- C. Samples: Submit samples of the following materials to Landscape Architect for approval:
 1. Soil amendment: (3) one-quart zip-locked plastic bags.
 2. Bark Mulch: (3) one-quart zip-locked plastic bags.
 3. Imported Topsoil: (3) one-quart zip-locked plastic bags.
- D. Provide soils analysis reports prepared by a qualified soils laboratory in accordance with the Soils Testing Requirements under "Soil Testing" in Article SOIL TESTING, in Part 3 of this section.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For landscape contractor.
- B. Prior to planting, submit copies of all trucking or packaging tags for all soil amendment, fertilizer and other additives to Landscape Architect so the quantities can be verified.
- C. Record of Pre-Installation Meeting.

1.7 CLOSEOUT SUBMITTALS

- A. Guarantee: Submit Subcontractor's guarantee.
- B. Record Drawings.

1.8 QUALITY ASSURANCE

- A. Qualifications: Work must be completed by a licensed Landscape Contractor. Provide proof of five years of continuous experience in landscaping and irrigation of projects of similar size (+/- 20% of the construction cost) and scope for education campuses. Landscape Contractor to have a minimum of two projects either completed or in construction in the last five years.
- B. Work Force: Ensure that an experienced foreman is present at all times during installation. Keep the same foreman and workers on the job from commencement to completion.
- C. Reviews: Specifically request reviews of all items listed below in Article INSPECTION REQUIREMENTS prior to progressing to the next level of work. The Owner's Representative reserves the right to inspect and reject material, both at place of growth and at site, before and/or after planting, for compliance with requirements for name, variety, size and quality.
- D. Reference Standards: Meet or exceed Federal, State and County laws requiring inspection of all plants and planting materials for plant disease and insect control.
- E. Plant Material:
 - 1. Conform to the current edition of Horticultural Standards for quality of Number 1 grade nursery stock as adopted by the American Association of Nurserymen. Conform to sizes specified on plant legend. Select plants which have a natural shape and appearance.
 - 2. Select only plants that are true to name, and tag one of each bundle or lot with the name of the plant in accordance with the standards of practice of the American Association of Nurserymen. In all cases, botanical names shall take precedence over common names.
 - 3. Tag each plant of a patented variety with the variety and identification number, where applicable, as it is delivered to the job site.
 - 4. Select only plants which have been nursery-grown in accordance with good horticultural practices and which have been grown under climatic conditions similar to those in the locality of the project for at least one year.
 - 5. Select only plants which are typical of their species or variety; have normal habits of growth; are sound, healthy, vigorous, well-branched and densely-foliated when in leaf; are free of disease, insect pests, eggs or larvae; and have a healthy and well-developed root system.

**LANDSCAPING
SECTION 32 9000
3595001**

6. Select only container stock that has been grown in the containers in which delivered for at least six (6) months, but not over two (2) years. Provide samples to show that there are no root-bound conditions.
7. Do not use plants that are severely pruned or headed-back to meet size requirements.
8. Do not plant container-grown plants that have cracked or broken balls of earth when taken from the container. Remove canned stock carefully from cans after containers have been cut on two sides with tin snips or other approved cutter.
9. At any time prior to final acceptance, be prepared to replace any plants that are rejected by the Owner's Representative because of physical damage to the plant.
10. Do not remove container-grown stock from containers before time of planting.
11. Stake shrubs with one-inch by one-inch by eighteen-inch (1"x1"x18") stakes in such manner that the stakes are not visible, and tie to upright position if they lean and/or are not growing in a vertical position.
12. Furnish quantities necessary to complete the work as shown on the Drawings and, if necessary, make up for any discrepancies in the quantities given in the Plant List at no additional cost to Owner.

1.9 DELIVERY, STORAGE AND HANDLING

- A. Packaged Materials: Deliver packaged materials in original, unopened containers showing weight, certified analysis, name and address of manufacturer, and indication of conformance with state and federal laws if applicable.
- B. Coordinate a time for the Landscape Architect to inspect the plants upon their delivery to the project site.
- C. Bulk Materials:
 1. Do not dump or store bulk materials near structures, utilities, walkways or pavements, or on existing turf areas or plants.
 2. Provide erosion-control measures to prevent erosion or displacement of bulk materials, discharge of soil-bearing water runoff, and airborne dust reaching adjacent properties, water conveyance systems, or walkways.
 3. Accompany each delivery of bulk fertilizers and soil amendments with appropriate certificates.

1.10 FIELD CONDITIONS

- A. Planting Season Limits: Do not plant when grounds are wet or temperature is below 25° F. Do not proceed with any soil preparation and fertilization if all planting cannot be completed within Planting Season Limit.

1.11 INSPECTION REQUIREMENTS

- A. Landscape Architect reserves the right to examine and reject plant material both at place of growth and at site, before and after planting, for compliance with requirements of name, variety, size, and quality.
- B. Obtain verification from Project Inspector for the following at the appropriate times during construction and prior to further progression of work in this Section:
 - 1. Rough grading is to tolerances specified in Section 31 0000 – Earthwork.
 - 2. The placement of landscape backfill material is as specified in this Section.
 - 3. Prior to the commencement of planting operations specified in this Section, the coverage and operation of the sprinkler irrigation system are as specified in Section 32 8000 - IRRIGATION.
 - 4. Required Test: For each load of soil amendment delivered to the site, spread at least two cubic yards (2 cy) of material onto a paved surface approximately two inches (2") deep. Pass a magnetic rake over the material in two directions. If any metal is found, test the entire load in the same manner. Perform all testing in the presence of the Project Inspector.
 - 5. Soil amendments, fertilizer, bark mulch and materials used for hydroseeding have been delivered to the site by the supplier, the invoices from the supplier indicate the project name and quantities delivered, and the Project Inspector has received copies of all such documents.
 - 6. Prior to planting, amendments and conditioners have been incorporated as per pre-planting recommendations, and planting areas have been made ready to receive planting.
- C. In case of failure to obtain any verification by the Project Inspector as required above, remove and replace work as necessary to obtain the verification at no additional cost to the Owner.

1.12 PROTECTION

- A. Provide protection for persons and property throughout progress of work. Use temporary barricades as required. Proceed with work in such manner as to minimize spread of dust and flying particles and to provide safe working conditions for personnel. Store materials and equipment where directed.
- B. Existing Construction: Execute work in an orderly and careful manner to protect paving, work of other trades, and other improvements.
- C. Existing Utilities: Provide protection for existing utilities within construction area. At no additional cost to Owner, repair any damages to utility lines that occur as a result of this work.

LANDSCAPING
SECTION 32 9000
3595001

- D. Landscaping: Protect landscape work and materials from damage due to landscape operations, operations by other contractors and trades, and trespassers. Maintain protection during installation and maintenance periods.

1.13 PLANTING SCHEDULE

- A. Install, establish, and maintain all lawn areas for a minimum of ninety (90) days prior to date of substantial completion. Coordinate schedule with other work and overall project schedule. Failure to install lawn areas by this date shall result in assessment of liquidated damages.
- B. Proceed with work in an orderly and timely manner to complete installation of landscaping within contract limits.

1.14 LANDSCAPE MAINTENANCE PERIOD REQUIREMENTS

- A. Beginning of Landscape Maintenance Period:
 - 1. General: Landscape Maintenance Period does not begin until all work is installed and either the sod has been placed or hydroseeded lawn has evenly germinated to an approximated blade height of one and one-half inches (1 ½"), as determined by Landscape Architect, in writing.
 - 2. On-site Inspection: When all work is complete, request and hold a meeting to include the Landscape Architect, Project Inspector, Architect and Owner's Representative who must together authorize and determine the start date for the landscape maintenance period. Coordinate and give notice of the date and time of the on-site meeting to all parties at least forty-eight (48) hours in advance.
 - 3. Acceptability: In cases where the lawn has reached adequate fullness and germination in some areas but not all, and authorization has not been given to begin the maintenance period, proceed with mowing, trimming, spraying, etc., as necessary prior to the beginning of the maintenance period.
- B. Duration of Landscape Maintenance Period:
 - 1. The Landscape Maintenance Period shall continue for a minimum of ninety (90) calendar days. During this time, continuously maintain all areas involved until final acceptance of the work by the Owner's Representative. See Landscape Maintenance Period procedure in Article LANDSCAPE MAINTENANCE, in Part 3 of this Section.

1.15 GUARANTEE

- A. The guarantee period for lawn and plant material shall be the duration of the landscape maintenance period, from commencement until final acceptance of the work of this Section.
- B. During the guarantee period, repair and/or replace plants and lawn not in satisfactory growing condition, as determined by Owner's Representative, without additional cost to Owner. Plants are to be replaced in accordance with Article LANDSCAPE MAINTENANCE in Part 3 of this Section, using plants of the same kind and size specified in plant list.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Use material in new and perfect condition as specified. Any deviations or substitutions from the Specification and Drawings must first be approved by Owner's Representative in writing prior to use.

2.2 SOIL PREPARATION MATERIALS

- A. Topsoil: Fertile; friable; natural loam surface soil; reasonably free of subsoil, clay lumps, brush, weeds and other litter; and free of roots, stumps, stones/rocks, and other extraneous or toxic matter harmful to plant growth.
- B. Soil Amendment: One-percent nitrogen-impregnated bark product with a ninety-percent (90%) bark base and zero to one-quarter inch (0-1/4") particle size, or approved equivalent. Do not spread until testing requirements have been satisfied.
- C. Fertilizer/Soil Conditioner: Gro-Power Plus or approved equal.
- D. Fertilizer for Trees and Shrubs: Seven-gram Gro-Power Planting Tablets (12-8-8 NPK) or approved equal.
- E. Vitamin B-1: "Superthrive", "Liquinox Start", "Cal-Liquid", or approved equal.

2.3 MISCELLANEOUS LANDSCAPE MATERIALS

- A. Bark Mulch: Untreated, shredded cedar.
- B. Tree-staking System: As indicated on Drawings.
- C. Pre-Emergent Weed Control: Oxadiazon, "Treeflan", "Ronstar 2G", "Surflan" (Elano Products Company), or approved equal.

**LANDSCAPING
SECTION 32 9000
3595001**

2.4 PLANT MATERIAL:

- A. Nursery Plant Stock:
 - 1. As indicated on Drawings. Do not remove container-grown stock from containers until planting time. Plants shall be true to name.
 - 2. Healthy, shapely, well-rooted, not pot-bound, free from insect pests or plant diseases and properly "hardened off" before planting. Replace plants that are not alive or are not in satisfactory growing condition, as determined by the Landscape Architect, without additional cost to Owner. The Landscape Architect may reject plants before and/or after planting.
 - 3. Labeled. Label at least one tree and one shrub of each species with a securely-attached, waterproof tag bearing legible designation of botanical and common name.
- B. Lawn Sod: Eighty percent (80%) Perennial Ryegrass and twenty percent (20%) Kentucky Bluegrass.

PART 3 - EXECUTION

3.1 SITE CONDITIONS

- A. Examine the site, verify grade elevations, and observe conditions under which work is to be performed. Do not proceed with work until unsatisfactory conditions have been corrected in a manner acceptable to the Owner's Representative.
- B. Proceed with complete landscape work as rapidly as portions of the site become available, working within seasonal limitations for each kind of landscape work required.
- C. Determine location of underground utilities and perform work in a manner which will avoid possible damage. Hand-excavate, as required, to minimize possibility of damage to underground utilities. Maintain grade stakes set by others until removal is mutually agreed upon by parties concerned.
- D. When conditions detrimental to sod or plant growth are encountered, such as rubble fill, adverse drainage condition, or other obstructions, notify the Owner's Representative before planting.

3.2 SOIL TESTING

- A. Coordinate soil testing in an expeditious and timely manner as required for on-site topsoil materials. Contract with a soil laboratory and include cost of sampling and testing in contract price. Take one (1) sample for every 5,000 square feet of landscape area up to a maximum of six (6) samples under the direction of and in the presence of the Owner's Representative.

- B. Submit each sample, according to the quantity of soil required by testing laboratory, to a competent laboratory approved by the Owner's Representative.
- C. Provide analysis of soil samples for pH, salinity, ammonia, phosphate, potassium, calcium, magnesium, boron, and sodium levels. Provide appraisal of chemical properties, including particle size determination, and recommendations for types and quantities of amendments and fertilizers.

3.3 PREPARATION

- A. Clearing of Vegetation:
 - 1. If live perennial weeds exist on site at the beginning of work, spray with a non-selective systemic contact herbicide as recommended and applied by an approved licensed landscape pest control advisor and applicator. Leave sprayed plants intact for at least 15 days.
 - 2. Clear and remove existing weeds by mowing or grubbing off all plant parts at least one-quarter inch ($\frac{1}{4}$ ") inch below surface of soil over entire areas to be planted.
- B. Soil preparation:
 - 1. Loosen soil in all planting areas, and on slopes flatter than 3:1 gradient, to a depth of six to eight inches (6" - 8") below finish grade. All debris, foreign matter, and stones shall be removed prior to the placing of any fertilizers or conditioners. Soil preparation is for all shrub planting beds, lawn hydroseeded areas and sodded lawn areas.
 - 2. Conduct the required soil tests and instruct the lab to include a minimum of the following soil improvements in the recommendation on the soils report.
 - a. Soil Amendment: Two cubic yards (2 cy) per 1,000 square feet.
 - b. Gro-Power Plus: One hundred fifty pounds (150 lbs) per 1,000 square feet.
 - c. If the lab recommends less than six cubic yards (6 cy) of soil amendment, the excess bid amount shall be applied to the cost of any additional recommended soil improvements, or returned to the Owner as a credit
 - 3. Apply amendments as follows, using rates recommended by the soils testing laboratory (the rates of amendments shown below are for bidding purposes only):
 - a. Fertilizer/Soil Conditioner: Broadcast 150 pounds of Gro Power Plus per 1,000 square feet in all planting areas and rototill to a depth of six to eight inches (6" - 8"). Remove from the site any rock and debris brought to the surface by cultivations. "Cultipack" all areas to receive sod or hydroseed.
 - b. Apply soil amendment to all planting areas at the rate of six cubic yards (6 cy) per 1,000 sf and rototill into the top six to eight inches (6" – 8").
 - 4. Upon completion of finish grading, request an review and obtain approval of Landscape Architect prior to commencement of planting or hydroseeding.

LANDSCAPING
SECTION 32 9000
3595001

C. Finish Grading for all Planting areas

1. Refer to Earthwork Specification Section for Rough Grading.
2. Grade to elevations and contours shown on Drawings. Fill low spots with landscape backfill material and grade to surface drain in manner indicated on Drawings.
3. Finish-grade so that the entire area within the contract lines has a natural and pleasing appearance as specified and as directed by Landscape Architect.
4. Adjust sprinkler heads flush to finish grade in preparation to receive hydroseeding or one-half inch above finish grade in preparation to receive sod. Reset sprinkler heads flush to grade after turf has germinated.
5. Flag the sprinkler heads and valve markers.

D. Planting Pits for Trees:

1. Excavate pits with vertical sides and with bottom of excavation slightly raised at center to provide proper drainage.
2. Set container-grown stock in center of pit on earth pedestal. Separate roots and/or prune roots as directed by Landscape Architect. In hot weather, pre-wet pit. Loosen outside roots from sides and bottom of root ball. When set, place additional backfill around base and sides of root ball. Work each layer to settle backfill and eliminate voids and air pockets. Water after placing final layer of backfill.
3. Loosen hard subsoil in bottom of excavation. Extend excavation as required to insure proper drainage from plant pits.
4. Fill excavated planting pits with water to half the depth of pit. Pits should drain within four hours (4 hrs). If planting pits do not drain, notify Project Inspector immediately. Do not proceed with planting until Landscape Architect has resolved a method to provide drainage.

E. Planting Pits for Shrubs/Groundcover:

1. Excavate pits and trenches with vertical sides and with bottom of excavation slightly raised at center to provide proper drainage.
2. Loosen hard subsoil in bottom of excavation. Extend excavation as required to insure proper drainage from plant pits.
3. Fill excavated planting pits with water to half the depth of pit. Pits should drain within four hours (4 hrs). If planting pits do not drain, notify Project Inspector immediately. Do not proceed with planting until Landscape Architect has resolved a method to provide drainage.

3.4 PLANTING

A. Lawn Sod:

1. Cultivate all lawn areas to a depth of six inches (6"). If cultivation does not break lumps, pull a spike-toothed harrow over the area behind the tractor.
2. Give all lawn areas that are to be sodded a smooth finish to prevent pockets. Do not allow any abrupt changes of surface. Prior to installation of sod, roll the grade with a 200-pound water-ballast roller. Request that the lawn grade be inspected and approved by the Landscape Architect prior to sodding to determine its suitability for planting. Obtain such approval prior to commencing sodding operations.
3. Do not take heavy objects (except lawn rollers) over lawn areas after they have been prepared for planting.
4. Completely lay the sod within twelve hours (12 hrs) of delivery. Do not leave sod on pallets in the hot sun longer than necessary.
5. Unroll sod carefully. Lay sod tight without any visible open joints, and without overlapping; stagger end joints twelve inches (12") minimum. Do not stretch or overlap sod pieces. Do not place sod in pieces smaller than twenty-four inches (24") in length by width of roll.
6. When new sod is to match existing turf, cut the edge of the existing turf in a series of straight lines that will accept new sod rolls in full width of the sod roll. Make the transition of grade between existing turf and new sod to be seamless with no change in elevation.
7. Immediately after laying sod, roll lawn areas with a 200-pound water-ballast roller.
8. Trim sod to conform to lawn shapes designated in Drawings.
9. On slopes of six inches (6") per foot and steeper, lay sod perpendicular to slope and secure every row with wooden pegs at a maximum of two feet (2') on center. Drive pegs flush with soil portion of sod.
10. Ensure that finished appearance is that of one continuous lawn.
11. Do not lay whole lawn before watering. When a conveniently large area has been sodded, water lightly to prevent drying. Continue to lay sod and to water until installation is complete.
12. All sod areas must be approved by Landscape Architect.
13. Water the complete lawn surface thoroughly. Moisten soil at least eight inches (8") deep. Repeat sprinkling at regular intervals to keep sod moist at all times until rooted. After sod is established, decrease frequency and increase amount of water per application as necessary.

LANDSCAPING
SECTION 32 9000
3595001

B. Shrubs:

1. Lay out individual shrub locations and areas for multiple plantings. Stake the locations, outline the areas, and secure the Owner's Representative's acceptance before beginning the planting work. Make minor adjustments as requested.
2. Scarify root ball prior to planting. Plant in holes twice the diameter of the root ball and to a depth equal to the container's height. Place the shrub and/or groundcover so the top of the root ball is one inch (1") higher than the surrounding grade. Set container-grown stock in center of pit. In hot weather, pre-wet the pit. When set, place additional backfill around base and sides of root ball. Work each layer to settle backfill and eliminate voids and air pockets. Thoroughly compact lower half of backfill in plant pit. See staking or guying detail. Water after planting. Provide a berm or watering basin for each tree. Add Vitamin B-1, in the proper solution as recommended by the manufacturer, to the second watering of the basin.
3. Place fertilizer planting tablets in root zone and alongside each plant. Follow manufacturer's instructions for number of tablets to use for each container size.
4. See Drawings for additional information.
5. Grooming and Staking of Trees:
 - a. Prune, thin-out and shape trees in accordance with standard horticultural practice. Prune trees to retain required height and spread. Unless otherwise directed by Landscape Architect, do not cut tree leaders, and remove only injured or dead branches from flowering trees.
 - b. Paint cuts over one-half inch ($\frac{1}{2}$ ") in size with standard tree paint or compound, covering exposed, living tissue. Use paint that is waterproof, antiseptic, adhesive, elastic and free of kerosene, coal tar, creosote, and other substances harmful to plants. Do not use shellac.
 - c. Stake or guy trees immediately after planting, as indicated on Drawings.
6. Grooming of Shrubs:
 - a. Prune, thin-out and shape shrubs in accordance with standard horticultural practice. Prune shrubs to retain natural character and to accomplish their use in landscape design. The required plant size is its size after pruning.
 - b. Remove and replace excessively pruned or malformed new plants resulting from improper pruning.

- C.** Request review by the Landscape Architect after locating, but prior to planting all trees. Under the direction of the Landscape Architect, make slight adjustments to plant material location as necessary to reflect original intention of Drawings.

3.5 WEED CONTROL

- A. Apply pre-emergent weed control to all planting areas (except lawn) after completion of all planting and one complete watering. Follow manufacturer's directions. To prevent washing away of weed control, do not over-water after its application. Do not allow any weed control into lawn areas. Treat any existing noxious weeds, such as Johnson grass, with Roundup in successive treatments until all roots are destroyed, then remove all grass and roots. Notify Owner's Representative of time of installation for verification of application.

3.6 BARK MULCH

- A. Apply mulch at the rate of three inches (3") deep to all planting areas, exclusive of lawn, after the planting and weed control are completed. Twelve inches (12") from planter edges, taper full depth of mulch to meet adjacent grades. Do not place mulch within three inches (3") of trunk or stems.

3.7 CLEAN-UP

- A. During construction, keep the site free of rubbish and debris, and clean up the site promptly when notified to do so. Take care to prevent spillage on streets from hauling and immediately clean up any such spillage and/or debris deposited on streets due to the work of this Section.
- B. During all phases of the construction work, take all precautions to abate dust nuisance by clean-up, sweeping, sprinkling with water, or other means as necessary.
- C. Paving: Maintain cleanliness of paving areas and other public areas used by equipment, and immediately remove spillage; remove rubbish, debris, and other material resulting from landscaping work, leaving site in a safe and clean condition.

3.8 LANDSCAPE MAINTENANCE

- A. The Landscape Maintenance Period will begin when all the Landscape Maintenance Period Requirements have been met (See Part 1 of these Specifications).
- B. Cleaning: Maintain cleanliness on paving areas and other public areas used by equipment and immediately remove all spillage. Remove from project site all rubbish and debris found thereon and all material and debris resulting from landscaping work, leaving the site in a safe and clean condition.
- C. Maintenance:
 - 1. Sprinkler Irrigation System:
 - a. Check system weekly for proper operation. Flush lateral lines out after removing last sprinkler head or two at each end of lateral. Adjust all heads as necessary for unimpeded coverage.

**LANDSCAPING
SECTION 32 9000
3595001**

- b. Set and program automatic controllers for seasonal water requirements. Provide the Owner's Representative with keys to the controllers and instructions on how to turn off system in case of emergency.
 - c. Repair all damages to sprinkler irrigation system as part of the contract work. Make repairs within one watering period or one week, whichever is the least amount of time.
2. Turf Areas:
- a. Begin mowing turf when grass has reached a height of three inches (3") and cut to a height of one-half inches to two inches (1 ½" - 2"). Mow at least weekly after the first cut. Turf must be well-established and free of bare spots and weeds, to satisfaction of Landscape Architect, prior to final acceptance. Do not mow lawns when the soil is not able to support maintenance equipment. Repair wheel marks and ruts caused by the maintenance equipment at no additional cost to the Owner.
 - b. Pick up grass clippings and remove from the site and premises.
 - c. Trim edges at least twice monthly for neat appearance. Vacuum or blow clippings off walks.
 - d. Water the lawns at such frequency as weather conditions require to replenish soil moisture below the root zone. Normally, a total of one and one-half inches (1 ½") of water is needed weekly in hot weather.
 - e. Fertilize the lawn areas at the beginning of the Landscape Maintenance Period and at the completion of the Landscape Maintenance Period. Use a fertilizer with the following characteristics:
 - 1) Slow release, Best 16-6-8, or approved equal, at the rate of 6.25 lbs per 1,000 square feet from March through October.
 - 2) Calcium Nitrate (15-0-0) at the rate of 6.5 lbs per 1,000 square feet from November through February.
 - f. Broadcast fertilizer using a mechanical spreader; do not apply by hand-broadcasting. Sweep all fertilizer off hardscape into adjacent planters.
 - g. Weekly as needed and as directed, re-sod lawn areas with material that matches previously installed material. Use sod to repair any bare areas. Repair areas to receive sod as follows:
 - 1) Mark out areas to receive new sod repair.
 - 2) Cut straight lines that will accept sod the full width of the roll and a minimum of twenty-four inches (24") in length.
 - 3) Transition the grade between existing turf and new sod seamlessly, with no change in elevation.

3. Shrubs:
 - a. Water enough that moisture penetrates throughout root zone and only as frequently as necessary to maintain healthy growth.
 - b. Construct and/or remove water basins around each plant, depending on the time of the year and as directed.
 - c. Do not prune unless directed by the Landscape Architect.
 - d. Replace any dead, dying or vandalized plant material on a weekly basis throughout the Landscape Maintenance Period.
 4. Insecticide and Herbicide Application:
 - a. If needed, control weeds with selective herbicides and sprays. In areas where crabgrass has infested the lawn, apply pre-emergent herbicides such as Dacthal by Amvac, Balan, or Betasan by Gowan for control prior to crabgrass germination. Control insect pests if necessary.
 - b. Use only a licensed Pest Control Operator to apply herbicides and sprays and to maintain a log for applications indicating material, timing, and rate.
- D. Final Acceptance of the Landscape Maintenance Period: request on-site meeting forty-eight hours (48 hrs.) in advance with the Landscape Architect and Owner's Representative to determine the end of the Landscape Maintenance Period.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Domestic water piping system.
 - 2. Fire protection piping systems.
 - 3. Sewer piping system

1.2 RELATED REQUIREMENTS

- A. Section 01 5000, Temporary Facilities and Controls.
- B. Section 01 6116, Volatile Organic Compound (VOC) Restrictions, for VOC limits pertaining to adhesives, sealants, fillers, primers, and coatings.
- C. Section 01 8113, Sustainable Design Requirements, for CAL-Green [and Collaborative for High Performance Schools (CHPS)] general requirements and procedures.
- D. Section 31 0000, Earthwork.
- E. Section 31 2333, Trenching and Backfilling.
- F. Section 32 1600, Site Concrete.

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CAL Green), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- C. California Plumbing Code, (CPC), edition as noted on the Drawings.
- D. California State Health and Safety Code Section 116875, Lead Free Public Water Systems.
- E. Local Jurisdiction: Any work within the street, highway or right-of-way shall be performed in accordance with the requirement of the governmental agencies having jurisdiction, and shall not begin until all of those governing authorities have been notified.
- F. ASTM International (ASTM):
 - 1. D422-63: Test Method for Particle Size Analysis of Soil.
 - 2. D698-00: Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures, Using 5.5 lb (2.49 Kg) Rammer and 12 inch (304.8 mm) Drop.

3. D1556-00: Test Method for Density of Soil in Place by the Sand-Cone Method.
4. D1557-02: Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 10 lb. (4.54 Kg) Rammer and 18 inch (457 mm) Drop.
5. D3017-05: Test Methods for Moisture Content of Soils and Soil-Aggregate Mixture by Nuclear Methods (Shallow Depth).
6. D4318-05: Test Method for Liquid Limit, Plastic Limit, and Plasticity Limit.

G. CALTRANS Standard Specifications.

H. CAL-OSHA, Title 8, Section 1590 (e).

I. NFPA 13, 24 and 25, per CFC chapter 80 and CBC chapter 35.

1.4 ADMINISTRATIVE REQUIREMENTS

A. Submittal Procedures:

1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
3. Sustainable Design Submittals shall comply with the additional requirements of Section 01 8113, Sustainable Design Requirements.

1.5 ACTION SUBMITTALS

- A. Provide supplier's descriptive literature for all products to demonstrate compliance with specified attributes.
- B. Substitution: Provide all data of proposed material being submitted as a substitution. Provide comparison with specified product data and identify all differences. Failure to provide comparison will be reason for rejection.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For contractor / installer.
- B. Provide sieve analysis from accredited testing lab on pipe bedding material. Analysis shall have a current date not older than project contract signing date.
- C. Sustainable Design:
1. General:
 - a. Submit information necessary to establish and document compliance with the California Green Building Standards Code.
 - b. Sustainable design submittals are in addition to other submittals.
 2. The following information shall be provided:
 - a. Adhesives and Sealants: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.

- b. Paints and Coatings: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.

1.7 CLOSEOUT SUBMITTALS

- A. Guarantee: Submit subcontractor's guarantee.
- B. Water Sterilization Test Report.

1.8 QUALITY ASSURANCE

- A. Contractor / Installer shall have been in business for five (5) years providing/finishing similar size projects and complexity.
- B. Contractor shall be solely responsible for all subgrades built. Any repairs resulting from inadequate compaction or incorrect grades will be the responsibility of the contractor.
- C. The representatives of the Owner's testing lab will not act as supervisor of construction, nor will they direct construction operations. Neither the presence of the Owner's testing lab representatives nor the testing by the Owner's testing lab shall excuse the contractors or subcontractors for defects or deficiencies discovered in their work during or following completion of the project. Correcting inadequate compaction is the sole responsibility of the contractor.
- D. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the drawings to be salvaged and re-used.
 - 1. Sun damaged or discolored PVC pipe will be rejected.
- E. All materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.

1.9 FEES, PERMITS, AND UTILITY SERVICES

- A. Obtain and pay for permits and service charges required for installation of Work. Arrange for required inspections and secure written approvals from authorities having jurisdiction.
- B. Upon completion of work within right-of-way, provide copies of written final approval to the Architect.

1.10 DELIVERY, STORAGE AND HANDLING

- A. Transport, store and handle in strict accord with the local jurisdiction and manufacturer's written recommendations
- B. Deliver undamaged products to job in manufacturer's sealed containers and/or original bundles with tags and labels intact.

1.11 EXISTING SITE CONDITIONS

- A. Contractor shall acquaint himself with all site conditions. If unknown active utilities are encountered during work, notify Architect promptly for instructions. Failure to notify will make Contractor liable for damage to these utilities arising from Contractor's operations subsequent to discovery of such unknown active utilities.
- B. Existing civil, mechanical and electrical improvements are shown on respective site plans to the extent known. Should the Contractor encounter any deviation between actual conditions and those shown, he is to immediately notify the Architect before continuing work.

1.12 PROTECTION

- A. Adequate protection measures shall be provided to protect workmen and passers-by on and off the site. Adjacent property shall be fully protected throughout the operations. Blasting will not be permitted. Prevent damage to adjoining improvements and properties both above and below grade. Restore such improvements to original condition should damage occur. Replace trees and shrubs outside building area disturbed by operations.
- B. In accordance with generally accepted construction practices, the Contractor shall be solely and completely responsible for working conditions at the job site, including safety of all persons and property during performance of the work. This requirement shall apply continuously and shall not be limited to normal working hours.
- C. Any construction review of the Contractor's performance conducted by the Geotechnical Engineer is not intended to include review of the adequacy of the Contractor's safety measures, in, on, or near the construction site.
- D. Provide shoring, sheeting, sheet piles and or bracing to prevent caving, erosion or gullyng of sides of excavation.
- E. Surface Drainage: Provide for surface drainage during period of construction in manner to avoid creating nuisance to adjacent areas. The contractor shall make a reasonable effort on a daily basis to provide pumps and all equipment necessary to keep all excavations and the site free from water during entire progress of work, regardless of cause, source, or nature of water.
- F. Adjacent streets and sidewalks shall be kept free of mud, dirt or similar nuisances resulting from earthwork operations.
- G. The site and adjacent influenced areas shall be watered as required to suppress dust nuisance. Dust control measures shall be in accordance with the local jurisdiction.
- H. Trees: Carefully protect existing trees that are to remain. Provide temporary irrigation as necessary to maintain health of trees.

1.13 SEASONAL LIMITS

- A. No fill material shall be placed, spread or rolled during unfavorable weather conditions. When work is interrupted by rains, fill operations shall not be resumed until field tests indicate that moisture content and density of fill are satisfactory.

1.14 RECORD DRAWINGS

- A. Keep a daily record of all pipe placed in ground, verified by Project Inspector.
- B. Upon completion of this Contract, furnish one tracing showing all outside utility lines, piping, etc., installed under this Contract. Locate and dimension all work with reference to permanent landmarks.
- C. All symbols and designations used in preparing "RECORD" drawings shall match those used in Contract drawings.
- D. Properly identify on as-builts and provide dimensions for all stubs for future connections. Provide concrete markers 6" dia. 12" deep, flush with finish grade at the ends of all stubbed pipes.
- E. Provide record drawings per Section 01 3300.

PART 2 - PRODUCTS

2.1 DESIGN AND PERFORMANCE CRITERIA

- A. Sustainable Design:
 - 1. VOC emissions for field-applied adhesives, sealants, and sealant primers must comply with limits specified in Section 01 6116.
 - 2. VOC emissions for field-applied paints and coatings must comply with limits specified in Section 01 6116.

2.2 MATERIALS - GENERAL

- A. Provide each item listed herein or shown on drawings of quality noted or approved equal. All material shall be new, full weight, standard in all respects and in first-class condition. Insofar as possible, all materials used shall be of same brand or manufacture throughout for each class of material or equipment. Materials shall be of domestic manufacture and shall be tested within Continental United States.
- B. Grade or quality of materials desired is indicated by trade names or catalog numbers stated herein.
- C. Dimensions, sizes, and capacities shown are minimum and shall not be changed without permission of Architect.
- D. All materials in this section used for any public water system or domestic water for human consumption shall be lead free.

1. For the purposes of this section, "lead free" means not more than 0.2 percent lead when used with respect to solder and flux and not more than 8 percent when used with respect to pipes and pipe fittings.
2. All pipe, pipe or plumbing fitting or fixtures, solder, or flux shall be certified by an independent American National Standards Institute (ANSI) accredited third party, including, but not limited to, NSF International, as being in compliance with this section.

E. All materials used for fire system piping shall be UL and FM approved.

2.3 VALVE BOXES

- A. Provide at each valve or cock in ground a Christy, Brooks, or equal to Christy G05CT, concrete valve box with cover marked for service, domestic water shall be marked "Water" and fire supply shall be marked "Fire". Furnish extension handles for each size square nut valve, and provide "fork" handle for each size of "wheel handle" valve as required. Do not locate valve boxes in walk, or covered passages, curbs, or curb & gutters, unless necessary. If valve location is within concrete or asphalt paved surface valve box shall be as detailed on plans for such condition. Provide valve box extensions as required to set bottom of valve box to bottom of piping in which valve is installed. Provide Owner with set of special wrenches and/or tools as required for operation of valves.

2.4 PIPES AND FITTINGS

- A. Sanitary Sewer: PVC sewer pipe and fittings with Ring-Tite joints, ASTM D3034 SDR35.
- B. Domestic water Lines 3 1/2" and smaller: Type K copper tubing, hard temper, with wrought copper fittings. Schedule 80 PVC, ASTM D 1784, ASTM D 1785.
- C. Water lines 4" and larger: AWWA C-900 Class 150/DR18 with rubber gasket joints.
- D. Fire lines 4" and larger: AWWA C-900 Class 200/DR14 with rubber gasket joints.
- E. Solder: Lead Free. 95/5; 95% Tin / 5% Antimony.
- F. Ductile Iron Pipe; AWWA Class 51, Cement Lined
- G. Ductile Iron Pipe Fittings; AWWA C110, C153, Ebba Iron, Star Romac, Sigma, or approved equal.
- H. PVC Mechanical Fittings; Ebba Iron, Star; Romac; Sigma or approved equal.
- I. Ductile Iron Pipe/PVC C-900 Pipe Restrained Fittings; Ebba Iron # 3800 Mega Coupling, Ebba Iron 1100CH Split Restrained Harness for pipe couplings. StarGrip Series 4000.
- J. Ductile Iron Pipe/PVC C900, C905 Restrained Degreedand Blind Cap Fittings,;
- K. Mega Lug; Sigma; Romac; or an approved equal

UTILITIES
SECTION 33 0000
3595001000

- L. Mechanical Fitting Bolts; Bolts and nuts shall be carbon steel with a minimum 60,000 psi tensile strength conforming to ASTM A 307, Grade A. Bolts shall be standard ANSI B1.1 Class 2A course threads. Nuts shall conform to ASTM A 563 and be standard ANSI B1.1, Class 2A course thread. All bolts and nuts shall be zinc coated.
- M. Fasteners Anti-Rust Coatings; After assembly, coat all fasteners with an Asphaltic Bituminous coatings conforming to latest edition NFPA 24.
- N. Ductile Iron Pipe Wrap; 8 mil polyethylene pipe wrap conforming to ANSI/AWWA C105/A21.5 standards.
- O. Pipe Insulation; Pipe exposed to atmospheric conditions ½" thru 4" NPT; Johns Manville rigid fiberglass insulation, Micro Lok HP; Owens Corning Fiberglas SSL II; Conforming to ASTM C 612, Type 1A or type 1B.
- P. Aluminum field applied pipe insulation jacket; comply with ASTM B209, ASTM C1729, ASTM C1371 Manufacturers; Childers Metals; ITW Insulation Systems Aluminum Jacketing; or an approved equal.
 - 1. Finish shall be flat mill finish
 - 2. Factory Fabricated Fitting Covers; 45 and 90 degree elbows, tee's, valve covers, end caps, unions, shall be of the same thickness and finish of jacket.
 - 3. The fittings shall be composed of 2-pieces
 - 4. Adhesives; per the manufacturers requirements
 - 5. Joint Sealant; shall be silicone, and shall be aluminum in color.
- Q. Sewer Forced Main; HDPE, DR 11, color gray with green stripe by JM Eagle or approved equal.

2.5 SANITARY SEWER MANHOLES

- A. Shall be constructed as shown on plan details.

2.6 CLEANOUTS

- A. Cleanouts of same diameter as pipe up to 8" in size shall be installed in all horizontal soil and waste lines where indicated and at all points of change in direction. Cleanouts shall be located not less than 18" from building so as to provide sufficient space for rodding. No horizontal run over 100 feet shall be without cleanout whether shown on drawings or not.
- B. All cleanout boxes shall be traffic rated with labeled lid, Christy G05CT or approved equal. Lid shall be vandal proof with stainless steel screws

2.7 UNIONS

- A. Furnish and install one union at each threaded or soldered connection to equipment and 2 unions, one on each side of valves on pipes ½" to 3".

- B. Locate unions so that piping can be easily disconnected for removal of equipment or valve. Provide type specified in following schedule:

Type of Pipe Union

Steel Pipe:	150 lb. Screwed malleable ground joint, brass, brass-to-iron seat, black or galvanized to match pipe.
-------------	---

Copper tubing:	Brass ground joint with sweat connections.
----------------	--

PVC Sch 80 pipe:	PVC union, FIPT X FIPT
------------------	------------------------

2.8 VALVES

- A. Provide valves as shown and other valves necessary to segregate branches or units. Furnish valves suitable for service intended. Valves shall be properly packed and lubricated. Valves shall be non-rising stem. Place unions adjacent to each threaded or sweat fitting valve. Install valves with bonnets vertical. All valves shall be lead free.
- B. Valves ½" thru 2"; shall be made of bronze, full size of pipe and lead free. Nibco S-113-FL Series; American G-300 Series; Matco 511 FL Series; Apollo 102T-FL Series. Brass valves of brass parts within valves will not be accepted.
- C. Valves, 2 ½" thru 3" shall be class 150; Shall be made of bronze, full size of pipe; Jenkins Fig. 2310 J; Lunkinheimer Fig. 2153; Crane Fig. 437; Stockham Fig. B-128.
- D. Valves, Flanged; 4" thru 12" Ductile Iron Resilient Wedge Gate Valve; Nibco F 609 RW; American 2500 Series; Kennedy 8561; Mueller 2360 Series.

2.9 TAPPING SLEEVE

- A. Shall be used on pipe sizes 6" thru 12" and shall be made with stainless steel material including stainless steel bolts. Flanges shall be ductile iron or high carbon steel. Gaskets shall seal full circumference of pipe. Shall be manufactured for operating pressure of 200 psi, and shall pass test pressure of 300 psi. Romac SST series; Smithblair 662; Mueller H304; Ford "FAST" tapping sleeve.

2.10 SERVICE SADDLES

- A. Shall be used on pipe size 2" thru 4". Body shall be made from ductile iron with epoxy coating or bronze. Cascade Style CSC-1; A.Y. McDonald model 3891 AWWA/3892 FNPT; Smith-Blair #317; Ford S70, S71, S90, (style B).

2.11 TRACER WIRE

- A. No. 10 THW solid copper wire. Solder all joints

PART 3 - EXECUTION

3.1 DRAWINGS AND COORDINATION

- A. General arrangement and location of piping, etc., are shown on Drawings or herein specified. Install work in accord therewith, except for minor changes that may be necessary on account of other work or existing conditions. Before excavation, carefully examine other work that may conflict with this work. Install this work in harmony with other craft and at proper time to avoid delay of work.
- B. Verify invert elevations at points of connection to existing systems prior to any excavation. If invert elevations differ from that shown on drawings, notify Architect immediately.
- C. In advance of construction, work out minor changes if conflicts occur with electrical or mechanical. Relocate services to suit actual conditions and work of other trades to avoid conflict therewith. Any adjustments or additional fittings to make adjustments shall not be cause for additional costs to the owner.
- D. Execute any work or apparatus shown on drawings and not mentioned in specifications, or vice versa. Omission from Drawings or Specifications of any minor details of construction, installation, materials, or essential specialties does not relieve Contractor of furnishing same in place complete.
- E. Graded pipes shall take precedence. If conflict should occur while placing the domestic water and fire service piping, the contractor shall provide any and all fittings necessary to route the water lines over such conflicting pipes at no additional costs to the owner.

3.2 ACCESS

- A. Continuously check for clearance and accessibility of equipment or materials specified herein to be placed. No allowance of any kind shall be made for negligence on part of Contractor to foresee means of installing his equipment or materials into proper position.

3.3 EXCAVATING AND BACKFILLING

- A. Excavation and Bedding:
 - 1. General: Trench straight and true to line and grade with bottom smooth and free of irregularities or rock points. Trench width to be a minimum of 12" wider than outside diameter of pipe. Follow manufacturer's recommendations for use of each kind and type of pipe.
 - 2. Bedding: Provide a bedding as noted on drawing details for the full length of the pipe. Bedding shall have a minimum thickness beneath the pipe of 4" or 1/8 the outside diameter of the pipe, which ever is greater. Provide bell holes and depressions for pipe joints only of size required to properly make joint.
 - 3. If the trenches for the site utilities falls within areas to be lime treated, the piping shall be installed prior to any lime treatment operations, providing the elevation of the piping is below the treatment section.

UTILITIES
SECTION 33 0000
3595001000

- a. If trenching is necessary in areas that have been previously lime treated the contractor shall backfill the trench with class 2 aggregate base, with minimum section equal to the lime treated section and compacted to 95%.

B. Laying of Pipe:

- 1. General: Inspect pipe prior to placing. Sun damaged pipe will be rejected. Set aside any defective or damaged material. Do not place pipe in water nor place pipe when trenches or weather are unsuitable. Lay pipe bell up grade, true to line and grade.
 - a. Sewer pipe shall be laid in strict conformity to the prescribed line and grade, with grade bars set and each pipe length checked to the grade line. Three consecutive points on the same rate of slope shall be used at all times to detect any variation from a straight grade. In any case of discrepancy, work shall be stopped and the discrepancy immediately reported to the Owner's Representatives. In addition, when requested by the Owner's Representative, a string line shall be used in the bottom of the trench to insure a straight alignment of the sewer pipe between manholes. The maximum deviation from grade shall not be in excess of 1/4 inch. In returning the pipe to grade, no more than 1/4" depression shall result.
 - b. The Contractor shall expose the end of existing pipe to be extended, for verification of alignment and elevation, prior to trenching for any pipe which may be affected. All costs of such excavation and backfill shall be included in the price paid for the various items of work.
 - c. A temporary plug, mechanical type shall be installed on sewer pipe at the point of connection to existing facilities. If connecting to a public facility the plug shall conform to the requirements of the local jurisdiction. This plug shall remain in place until the completion of the balling and flushing operation.
- 2. Bell and Spigot Joints: Lubricate inside of bells and outside of spigots with soap solution. Wedge joints tight. Bell of bell and spigot pipe to be pointed up grade.

C. Backfilling:

- 1. General: Do not start backfill operations until required testing has been accomplished.
- 2. Compaction and Grading: Remainder of backfill shall be in accordance with Section 31 2333 – TRENCHING AND BACKFILLING.
- 3. If trenching in area previously lime or cement treated backfill top of trench section, same depth as lime or cement treatment with Class 2 Aggregate Base compacted to 95% minimum relative compaction.

3.4 INSTALLATION OF WATER PIPING

- A. Immediately cap or plug ends of, and opening in, pipe and fittings to exclude dirt until final connections made. Use reducing fittings where any change in pipe size occurs. Bushings shall not be used.

- B. General: Should existing conditions or other work prevent the running of pipes or the setting of equipment at the points indicated by drawings, changes as authorized by the Architect shall be made without additional cost to the Owner.
- C. All bolts used on mechanical fittings shall be thoroughly coated with an asphaltic bituminous coating conforming to 2007 NFPA (National Fire Protection Association) 10.3.5.2 and 10.8.3.5, CBC chapter 35 and CFC chapter 80.
- D. All buried metal shall be incased with 8 mil polyethylene wrap so that no soil is in contact with metal. Ends of polyethylene wrap shall be taped to provide seal with pipe.
- E. Do not install water lines in same trench with non-metallic sewer lines unless bottom of water pipe at all points is at least 12" above top of sewer line and water line is placed on solid shelf excavated at one side of common trench with a minimum of 12 inch horizontal separation.
- F. Under no circumstance shall a fitting be located directly under a structural footing without prior approval from the Architect.
- G. In locations where existing domestic pipe is rerouted, the new pipe shall be assembled using restrained fittings at all joints including factory pipe joints. Tapped restrained blind flanges shall be temporarily installed at each end of the assembled pipes until testing and chlorination is completed and approved.

3.5 CLOSING IN OF UNINSPECTED WORK

- A. Do not allow or cause work installed to be covered up or enclosed before it has been inspected, tested, and approved. Should work be enclosed or covered up before it has been approved, uncover work at own expense. After it has been inspected, tested and approved, make repairs necessary to restore work of other contractors to condition in which it was found at time of cutting.

3.6 CARE AND CLEANING

- A. Repair or replace broken, damaged, or otherwise defective parts, materials, and work. Leave entire work in new condition satisfactory to Architect. At completion, carefully clean and adjust equipment, fixtures and trim that are installed as part of this work. Leave systems and equipment in satisfactory new operating condition.
- B. Drain and flush piping to remove grease and foreign matter.
- C. Sewer piping shall be balled and flushed.
- D. Clean out and remove surplus materials and debris resulting from the work, including surplus excavated material.
- E. Flush fire service piping in the presence of the project inspector. Flushing shall be continued for a sufficient time as necessary to ensure all foreign material has been removed. Flow rate shall be equal to site fire flow requirements.

3.7 SEWER INTERNAL INSPECTIONS

- A. Upon completion of construction and prior to final inspection, the Contractor shall clean the entire new pipeline of all dirt and debris. Any dirt or debris in previously existing pipes or ditches in the area, which resulted from the new installation, shall also be removed. Pipes shall be cleaned by the controlled balling and flushing method. Temporary plugs shall be installed and maintained during cleaning operations at points of connection to existing facilities to prevent water, dirt, and debris from entering the existing facility.

3.8 TEST OF PIPING

- A. Pressure Test piping at completion of roughing-in, in accord with following schedule, and show no loss in pressure or visible leaks after minimum duration or four (4) hours at test pressures indicated.
- B. Chlorination tests shall be performed after all fixtures and any required mechanical devices are installed and the entire system is complete and closed up.
- C. In cases where new domestic water piping is assembled for re-routing of existing domestic water pipe, the contractor shall perform the following testing prior to connecting the new water pipe to the existing system.
 - 1. The pipe shall be pressure tested and per the test schedule.
 - 2. The pipe shall be pressure tested down within the trench.
 - 3. The contractor shall dig a temporary ditch below the existing pipe to drain to a sump that is lower than the bottom of the trench and to the side of the trench. The sump shall be 30% larger than the total volume of water within the testing pipe assembly.
 - 4. After pressure testing and chlorination has taken place and accepted, the contractor shall drain the pipe into the sump and pump the sump out as it is filling.
 - 5. The temporary test fittings at each end of the pipe assembly shall be removed and the final restrained couplings installed.
 - 6. The existing piping shall be cut and the water within the pipe shall drain below the pipe to the temporary sump. Pump the sump as it is being filled up. Take extreme caution not to contaminate the existing pipe with any contaminants within the trench.
 - 7. Before making the final coupling connections, the restrained couplings at each end of the new pipe shall be thoroughly swabbed inside the fitting with a solution of chlorine mixed with water at a rate of 1 part chlorine to 4 parts potable water.
 - 8. After final connections are made, a visual inspection shall be made after fittings are wiped off. If after 1 hr, no noticeable drips are noted the pipe can be backfilled.
 - 9. The contractor shall flush all water piping affected by chlorination until it is within acceptable levels approved by certified testing lab.

TEST SCHEDULE

<u>System Tested</u>	<u>Test Pressure PSIG Test With</u>
Public Water Mains	Per local jurisdiction requirements.
Private Domestic Water Piping:	150 Lbs. Water 4 hrs.
Fire Protection Piping:	200 Lbs. Water pressure, 4 hrs duration with no pressure loss.
Sanitary Sewer Piping:	Sewer system shall be tested for leakage per local jurisdiction requirements.

- D. Testing equipment, materials, and labor shall be furnished by contractor.

3.9 WATER SYSTEM STERILIZATION

- A. Public Water Mains: Shall be flushed and disinfected per the local jurisdiction requirements
- B. Clean and disinfect all site water systems connected to the domestic water systems in accordance with AWWA Standard C651 and as required by the local Building and Health Department Codes, and EPA.
 - 1. Clean and disinfect industrial water system in addition to the domestic water system.
 - 2. Disinfect existing piping systems as required to provide continuous disinfection upstream to existing valves. At Contractors option, valves may be provided to isolate the existing piping system from the new piping system.
- C. Domestic water sterilization shall be performed by a licensed “qualified applicator” as required by CAL-EPA Pesticide Enforcement Branch for disinfecting and sterilizing drinking water.
- D. Disinfecting Agent: Chlorine product that is a registered product with Cal-EPA for use in California potable water lines, such as Bacticide, CAL-EPA Registration No. 37982-20001.
- E. Contractor to provide a 1” service valve connected to the system at a point within 2’-0” of its junction with the water supply line. After sterilization is complete Contractor to provide cap at valve.
- F. Sterilization Procedure to be as follows:
 - 1. Flush pipe system by opening all outlets and letting water flow through the system until clear water flows from all outlets.

UTILITIES
SECTION 33 0000
3595001000

2. Inject disinfecting agent to provide a minimum chlorine residual concentration of at least 50 parts per million (ppm) of free chlorine at each outlet.
 3. Provide sign at all outlets which reads "Water Sterilization in Progress – Do not operate". Remove signs at conclusion of test.
 4. Close all outlets and valves, including valve connecting to water supply line and 1" service valve. Retain treated water in pipe for a minimum of twenty-four hours. Should chlorine residual at pipe extremities be less than 50 PPM at this time, pipe shall be re-chlorinated. As an option, the water systems may be filled with a water-chlorine solution containing a minimum of 200 PPM of chlorine and allowed to stand for three hours.
 5. After chlorination, flush lines of chlorinated water and refill from domestic supply. Continue flushing until residual chlorine is less than or equal to 0.2 ppm, or a residual the same as that of the test water.
- G. Chemical and bacteriological tests shall be conducted by a state-certified laboratory and approved by the local authorities having jurisdiction.
- H. Submit written report to Health Department as required by State Regulations. Provide a copy of report to Architect prior to completion of project.
- I. The costs of sterilization and laboratory testing shall be paid for by the contractor.

3.10 CLEANING

- A. Upon completion of work of this Section promptly remove from the working area all scraps, debris and surplus material of this Section.

END OF SECTION

s:\master specifications\division 33 - utilities\33 0000_utilities.docx
Formatting Updated: 9-13-21

PART 1 - GENERAL

1.1 SUMMARY

- A. Summary Includes:
 - 1. Storm drainage piping systems.

1.2 RELATED REQUIREMENTS

- A. Section 01 5000, Construction Facilities and Controls.
- B. Section 01 6116, Volatile Organic Compound (VOC) Restrictions, for VOC limits pertaining to adhesives, sealants, fillers, primers, and coatings.
- C. Section 01 8113, Sustainable Design Requirements, for CAL-Green **[and Collaborative for High Performance Schools (CHPS)]** general requirements and procedures.
- D. Section 31 0000, Earthwork.
- E. Section 31 2333, Trenching and Backfilling.
- F. Section 32 1200, Asphalt Concrete Paving.
- G. Section 32 1600, Site Concrete

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CAL Green), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- C. California Plumbing Code, (CPC), edition as noted on the Drawings.
- D. Local Jurisdiction: Any work within the street, highway or right-of-way shall be performed in accordance with the requirement of the governmental agencies having jurisdiction, and shall not begin until all of those governing authorities have been notified.
- E. ASTM International (ASTM):
 - 1. D 422-63 Test Method for Particle Size Analysis of Soil.
 - 2. D698-00 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures, Using 5.5 lb (2.49 Kg) Rammer and 12 inch (304.8 mm) Drop.
 - 3. D1556-00 - Test Method for Density of Soil in Place by the Sand-Cone Method.
 - 4. D1557-02 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 10 lb. (4.54 Kg) Rammer and 18 inch (457 mm) Drop.

STORM DRAINAGE UTILITIES
SECTION 33 4000
3595001000

5. D 3017-05 Test Methods for Moisture Content of Soils and Soil-Aggregate Mixture by Nuclear Methods (Shallow Depth).
6. D 4318-05 Test Method for Liquid Limit, Plastic Limit, and Plasticity Limit.

F. CALTRANS Standard Specifications.

G. CAL-OSHA, Title 8, Section 1590 (e).

1.4 ADMINISTRATIVE REQUIREMENTS

A. Submittal Procedures:

1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
3. Sustainable Design Submittals shall comply with the additional requirements of Section 01 8113, Sustainable Design Requirements.

1.5 ACTION SUBMITTALS

- A. Provide supplier's descriptive literature for all products to demonstrate compliance with specified attributes.
- B. Substitution: Provide all data of proposed material being submitted as a substitution. Provide comparison with specified product data and identify all differences. Failure to provide comparison will be reason for rejection.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: Contractor / installer.
- B. Provide sieve analysis from accredited testing lab on pipe bedding material. Analysis shall have a current date not older than project contract signing date.
- C. Sustainable Design:
1. General:
 - a. Submit information necessary to establish and document compliance with the California Green Building Standards Code.
 - b. Sustainable design submittals are in addition to other submittals.
 2. The following information shall be provided:
 - a. Adhesives and Sealants: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.
 - b. Paints and Coatings: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.

1.7 CLOSEOUT SUBMITTALS

- A. Guarantee: Submit subcontractor's guarantee.

1.8 QUALITY ASSURANCE

- A. Contractor / Installer shall have been in business for five (5) years providing/finishing similar size projects and complexity.
- B. Contractor shall be solely responsible for all subgrades built. Any repairs resulting from inadequate compaction are the responsibility of the contractor.
- C. The representatives of the Owner's testing lab will not act as supervisor of construction, nor will they direct construction operations. Neither the presence of the Owner's testing lab representatives nor the testing by the Owner's testing lab shall excuse the contractors or subcontractors for defects discovered in their work during or following completion of the project. Correcting inadequate compaction is the sole responsibility of the contractor.
- D. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.
 - 1. Sun damaged or discolored PVC pipe will be rejected.
- E. All materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.

1.9 DELIVERY, STORAGE AND HANDLING

- A. Transport, store and handle in strict accord with the local jurisdiction and manufacturer's written recommendations
- B. Deliver undamaged products to job in manufacturer's sealed containers and/or original bundles with tags and labels intact.

1.10 EXISTING SITE CONDITIONS

- A. Contractor shall acquaint himself with all site conditions. If unknown active utilities are encountered during work, notify Architect promptly for instructions. Failure to notify will make Contractor liable for damage to these utilities arising from Contractor's operations subsequent to discovery of such unknown active utilities.
- B. Existing civil, mechanical and electrical improvements are shown on respective site plans to the extent known. Should the Contractor encounter any deviation between actual conditions and those shown, he is to immediately notify the Architect before continuing work.

1.11 PROTECTION

- A. Adequate protection measures shall be provided to protect workmen and passers-by on and off the site. Adjacent property shall be fully protected throughout the operations.

STORM DRAINAGE UTILITIES
SECTION 33 4000
3595001000

Blasting will not be permitted. Prevent damage to adjoining improvements and properties both above and below grade. Restore such improvements to original condition should damage occur. Replace trees and shrubs outside building area disturbed by operations.

- B. In accordance with generally accepted construction practices, the Contractor shall be solely and completely responsible for working conditions at the job site, including safety of all persons and property during performance of the work. This requirement shall apply continuously and shall not be limited to normal working hours.
- C. Any construction review of the Contractor's performance conducted by the Geotechnical Engineer is not intended to include review of the adequacy of the Contractor's safety measures, in, on, or near the construction site.
- D. Provide shoring, sheeting, sheet piles and/or bracing to prevent caving, erosion or gullyng of sides of excavation.
- E. Surface Drainage: Provide for surface drainage during period of construction in manner to avoid creating nuisance to adjacent areas. The contractor shall make a reasonable effort on a daily basis to provide pumps and all equipment necessary to keep all excavations and the site free from water during entire progress of work, regardless of cause, source, or nature of water.
- F. Adjacent streets and sidewalks shall be kept free of mud, dirt or similar nuisances resulting from earthwork operations.
- G. The site and adjacent influenced areas shall be watered as required to suppress dust nuisance. Dust control measures shall be in accordance with the local jurisdiction.
- H. Trees: Carefully protect existing trees that are to remain.

1.12 SEASONAL LIMITS

- A. No fill material shall be placed, spread or rolled during unfavorable weather conditions. When work is interrupted by rains, fill operations shall not be resumed until field tests indicate that moisture content and density of fill are satisfactory.

1.13 TESTING

- A. General: Refer to Section 01 4523 – Testing and Inspection Services, and Structural Tests and Inspections List, DSA-103.
- B. Geotechnical Engineer: Owner is retaining a Geotechnical Engineer to determine compliance of fill with Specifications, and to direct adjustments in fill operations. Costs of Geotechnical Engineer will be borne by Owner; except those costs incurred for re-tests or re-inspection will be paid by Owner and backcharged to Contractor.

1.14 RECORD DRAWINGS

- A. Keep a daily record of all pipe placed in ground, verified by Project Inspector.

STORM DRAINAGE UTILITIES
SECTION 33 4000
3595001000

- B. Upon completion of this Contract, furnish one tracing showing all outside utility lines, piping, etc., installed under this Contract. Locate and dimension all work with reference to permanent landmarks.
- C. All symbols and designations used in preparing "RECORD" drawings shall match those used in Contract drawings.
- D. Properly identify all stubs for future connections, as to location and use, by setting of concrete marker at finished grade in the manner suitable to Architect.

PART 2 - PRODUCTS

2.1 DESIGN AND PERFORMANCE CRITERIA

- A. Sustainable Design:
 - 1. VOC emissions for field-applied adhesives, sealants, and sealant primers must comply with limits specified in Section 01 6116.
 - 2. VOC emissions for field-applied paints and coatings must comply with limits specified in Section 01 6116.

2.2 MATERIALS

- A. Pipe: Use one of the following, unless noted on the Drawings otherwise.
 - 1. Polyvinyl Chloride Pipe (PVC): SDR35 conforming to ASTM D3034 with elastomeric joints conforming to ASTM D3212 for pipe to 12". Sun damaged pipe will be rejected.
 - 2. High density polyethylene pipe (HDPE): The pipe shall be corrugated exterior/smooth interior pipe. 12" to 60" maximum diameter shall conform to AASHTO M294, water tight per ASTM D3212 with water tight gasket fittings.
- B. Perforated Pipe (for subdrains): Shall be ADS N12 pipe, 3 hole, ASTM F 405, AASHTO M 252; PCV ASTM D3034 SDR-35 storm drain pipe
- C. Manhole: Shall be as shown on the drawing details.
- D. Drop Inlet: Shall be as shown on the drawing details.
- E. Curb Inlet: Shall be as shown on the drawing details.
- F. Mortar: For pipe connections to concrete drainage structures, conform to ASTM C270 type N mortar. Place within one half hour after adding water.
- G. Crushed Rock: Imported washed crushed rock. Minimum 100% passing 3/4 inch sieve.
- H. Trench drain: Polycast, Polydrain or equal and as shown on drawings.
- I. Area Drains: Shall be as shown on the drawing details.

STORM DRAINAGE UTILITIES
SECTION 33 4000
3595001000

- J. Floor Drains: Shall be as shown on the drawing details.
- K. Clean-outs: Shall be as shown on the drawing details.
- L. Planter drains: Shall be as detailed on the drawing details.
- M. Filter Fabric: Mirafi 140N.

PART 3 - EXECUTION

3.1 INSPECTION LAYOUT AND PREPARATION

- A. Prior to installation of the work of this Section, carefully inspect and verify by field measurements that installed work of all other trades is complete to the point where this installation may properly commence
- B. Layout all work, establish grades, locate existing underground utilities, set markers and stakes, setup and maintain barricades and protection facilities; all prior to beginning actual earthwork operations. Layout and staking shall be done by a licensed Land Surveyor or Professional Civil Engineer.
- C. Verify that specified items may be installed in accordance with the approved design.
- D. In event of discrepancy, immediately notify Owner and the Architect. Do not proceed in discrepant areas until discrepancies have been fully resolved.

3.2 EXCAVATION AND BACKFILLING

- A. General: Installation shall be in strict conformance with referenced standards, the manufacturer's written directions, as shown on the drawings and as herein specified.
- B. Verify invert elevations at points of connection to existing systems prior to any excavation. If invert elevations differ from that shown on drawings, notify Architect immediately.
- C. Excavation and Bedding:
 - 1. General: Trench straight and true to line and grade with bottom smooth and free of irregularities or rock points. Trench width in accordance with pipe manufacturer's recommendations and as per the drawings. Follow manufacturer's recommendations for use of each kind and type of pipe.
 - 2. Bedding: Provide bedding as detailed on plans for the full length of the pipe. Bedding shall have a minimum thickness beneath the pipe of 4" or 1/8 the outside diameter of the pipe, whichever is greater. Provide bell holes and depressions for pipe joints only of size required to properly make joint.
 - 3. If the trenches for the site drainage fall within areas to be lime treated, the piping shall be installed prior to any lime treatment operations.
 - a. If additional piping is added to previously lime treated areas, the contractor shall backfill the trench with class 2 aggregate base and compact to 95%.

STORM DRAINAGE UTILITIES
SECTION 33 4000
3595001000

D. Laying of Pipe:

1. General: Inspect pipe prior to placing. Set aside any defective or damaged material. Do not place pipe in water nor place pipe when trenches or weather are unsuitable. Lay pipe upgrade, true to line and grade.
2. Bell and Spigot Joints: Lubricate inside of bells and outside of spigots with soap solution or as recommended by manufacture. Wedge joints tight. Bell of bell and spigot pipe to be pointed upgrade.
3. Pipe shall be bedded uniformly throughout its length.
4. Pipe elevation shall be within 0.02 feet of design elevation as shown on plans.
5. Off Site Work: All work beyond the property lines shall be done in strict conformance with the requirements of the governing agency.

E. Backfilling:

1. General: Do not start backfill operations until required testing has been accomplished.
2. Trenches and Excavations: Backfill with material as detailed on plans, filling both sides of the pipe at the same time, carefully tamping to hold pipe in place without movement. Refer to Section 31 2333 – TRENCHING AND BACKFILLING for fill above this layer.

F. Grouting of Pipes: Grout pipes smooth and water tight at drop inlet, manholes, and curb inlets. Grout back side of hood at curb inlets all grouting shall be smooth and consistent.

G. Off Site Work: All work beyond the property lines shall be done in strict conformance with the requirements of the local agency.

H. Cutting and Patching: Remove and replace existing surface features per applicable specification section (i.e. asphaltic concrete or concrete paving) where pipe is installed in areas of existing improvements.

3.3 TOLERANCES

A. Storm Drain structure grates

1. In landscape and lawn areas $\pm 0.05'$.
2. In sidewalk and asphalt pavement $\pm 0.025'$.
3. In curb and gutter application $\pm 0.0125'$.

B. Cleanout Boxes and Lids

1. In landscape areas; 0.10 higher than surrounding finish grade, $\pm 0.05'$.
2. In sidewalks and asphalt pavement; Flush with surrounding finish grade, $\pm 0.025'$.

3.4 DEWATERING

A. Contractor to provide trench dewatering as necessary, no matter what the source is, at no additional cost to the owner.

STORM DRAINAGE UTILITIES
SECTION 33 4000
3595001000

3.5 FLUSHING

- A. The Contractor shall thoroughly ball and flush the storm drain system to remove all dirt and debris. Discharge water to an approved location.

3.6 CLEANING

- A. Upon completion of work of this Section promptly remove from the working area all scraps, debris and surplus material of this Section.
- B. Clean the dirt, rocks, and debris from the drop inlets and storm drain manholes.

END OF SECTION

**Art Freiler Elementary School -
Shade Structures**

2421 W. Lowell Ave., Tracy, CA 95377

3595001

Tracy Unified School District

1875 W Lowell Ave., Tracy, CA 95376

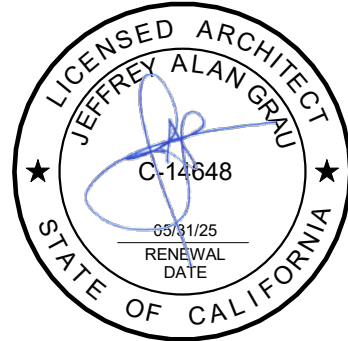


May 16, 2024

Art Freiler Elementary School - Shade Structures
Tracy Unified School District
Tracy, California

May 16, 2024

HMC # 3595001



HMC ARCHITECTS
Architect



Warren Consulting Engineers
Civil Engineer



MTW Group
Landscape Architect

TABLE OF CONTENTS

DIVISION 00 - PROCUREMENT AND CONTRACTING REQUIREMENTS - NOT USED

DIVISION 01 - GENERAL REQUIREMENTS

SECTION	01 1100 - Summary of Work
	01 2100 - Allowance
	01 2513 - Product Options and Substitutions
	01 2600 - Changes in the Work
	01 2900 - Application for Payment and Conditional and Unconditional Waiver and Release Forms
	01 3119 - Project Meetings
	01 3213 - Scheduling of Work
	01 3300 - Submittal (Including Submittal Transmittal, Substitution Request, RFI, Electronic Data Request, Certification of Compliance for Building Materials, Roof Certification)
	01 3513.23 - Site Standards
	01 3516 - Alteration Project Procedures
	01 3543 - Environmental Procedures
	01 4100 - Regulatory Requirements
	01 4213 - Abbreviations and Acronyms
	01 4216 - Definitions
	01 4219 - References
	01 4300 - Materials and Equipment
	01 4500 - Quality Control
	01 4516 - Field Quality Control Procedures
	01 4523 - Testing and Inspection Services
	01 5000 - Temporary Facilities and Controls
	01 5013 - Construction Waste Management and Disposal
	01 5213 - Field Offices
	01 5639 - Temporary Tree Protection
	01 5713.10 - Erosion Control
	01 6116.10 - Volatile Organic Compound (VOC) Restrictions
	01 6600 - Product Delivery Storage and Handling
	01 7123 - Field Engineering
	01 7329 - Cutting and Patching
	01 7419 - Construction Waste Management and Disposal
	01 7419A - Contractor's Construction Waste and Recycling Plan
	01 7419B - Contractor's Reuse, Recycling and Disposal Report
	01 7600 - Alteration Project Procedures
	01 7700 - Contract Closeout and Final Cleaning
	01 7823 - Operation and Maintenance Data
	01 7836 - Warranties (Including Contractor Standard Warranty Form, Subcontractor Standard Warranty Form, Special Extended Warranty Form)
	01 7839 - Record Documents
	01 8113.10 - Sustainable Design Requirements

DIVISION 02 - EXISTING CONDITIONS - NOT USED

DIVISION 03 - CONCRETE - NOT USED

DIVISION 04 - MASONRY - NOT USED

DIVISION 05 - METALS - NOT USED

DIVISION 06 - WOOD, PLASTICS, AND COMPOSITES - NOT USED

DIVISION 07 - THERMAL AND MOISTURE PROTECTION - NOT USED

TABLE OF CONTENTS

DIVISION 08 - OPENINGS - NOT USED

DIVISION 09 - FINISHES - NOT USED

DIVISION 10 - SPECIALTIES

SECTION 10 1400 - Signage
 10 2813 - Toilet Accessories

DIVISION 11 - EQUIPMENT - NOT USED

DIVISION 12 - FURNISHINGS - NOT USED

DIVISION 13 - SPECIAL CONSTRUCTION - NOT USED

DIVISION 14 - CONVEYING EQUIPMENT - NOT USED

DIVISION 21 - FIRE SUPPRESSION - NOT USED

DIVISION 22 - PLUMBING - NOT USED

DIVISION 23 - HEATING, VENTILATING AND AIR CONDITIONING (HVAC) - NOT USED

DIVISION 26 - ELECTRICAL - NOT USED

DIVISION 27 - COMMUNICATIONS - NOT USED

DIVISION 28 - ELECTRONIC SAFETY AND SECURITY - NOT USED

DIVISION 31 - EARTHWORK

SECTION 31 0000 - Earthwork
 31 2333 - Trenching and Backfilling

DIVISION 32 - EXTERIOR IMPROVEMENTS

SECTION 32 1200 - Asphalt Concrete Paving
 32 1600 - Site Concrete
 32 1819.13 - Playground Protective Surfaces
 32 1816.16 - Synthetic Turf
 32 3119.20 - Decorative Metal Fences and Gates (Mechanically Fastened)
 32 8000 - Irrigation
 32 9000 - Landscaping

DIVISION 33 - UTILITIES

SECTION 33 0000 - Utilities
 33 4000 - Storm Drainage Utilities

SUMMARY OF WORK

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Site Access Conditions and Requirements;
- B. Special Conditions.

1.02 SUMMARY OF WORK COVERED BY CONTRACT DOCUMENTS

- A. The Work of this Contract consists of the following at Art Freiler Elementary School:
 - (1) Construction and installation of 1 - 40' hexagon PC shade structure, 1-40'x40'x40' Triangle PC shade structure, 1- play apparatus w/ poured in place rubber surfacing, existing restroom upgrades and related civil and landscape upgrades.

1.03 CONTRACTS

- A. Perform the Work under a single, fixed-price Contract.

1.04 WORK BY OTHERS

- A. Fabrication of the shade structures and play apparatus.

1.05 CODES, REGULATIONS, AND STANDARDS

- A. The codes, regulations, and standards adopted by the state and federal agencies having jurisdiction shall govern minimum requirements for this Project. Where codes, regulations, and standards conflict with the Contract Documents, these conflicts shall be brought to the immediate attention of the District and the Architect.
- B. Codes, regulations, and standards shall be as published effective as of date of bid opening, unless otherwise specified or indicated.

1.06 PROJECT RECORD DOCUMENTS

- A. Contractor shall maintain on Site one set of the following record documents; Contractor shall record actual revisions to the Work:
 - (1) Contract Drawings.

- (2) Specifications.
 - (3) Addenda.
 - (4) Change Orders and other modifications to the Contract.
 - (5) Reviewed shop drawings, product data, and samples.
 - (6) Field test records.
 - (7) Inspection certificates.
 - (8) Manufacturer's certificates.
- B. Contractor shall store Record Documents separate from documents used for construction. Provide files, racks, and secure storage for Record Documents and samples.
 - C. Contractor shall record information concurrent with construction progress.
 - D. Specifications: Contractor shall legibly mark and record at each product section of the Specifications the description of the actual product(s) installed, including the following:
 - (1) Manufacturer's name and product model and number.
 - (2) Product substitutions or alternates utilized.
 - (3) Changes made by Addenda and Change Orders and written directives.

1.07 EXAMINATION OF EXISTING CONDITIONS

- A. Contractor shall be held to have examined the Project Site and acquainted itself with the conditions of the Site and of the streets or roads approaching the Site.
- B. Prior to commencement of Work, Contractor shall survey the Site and existing buildings and improvements to observe existing damage and defects such as cracks, sags, broken, missing or damaged glazing, other building elements and Site improvements, and other damage.
- C. Should Contractor observe cracks, sags, and other damage to and defects of the Site and adjacent buildings, paving, and other items not indicated in the Contract Documents, Contractor shall immediately report same to the District and the Architect.

1.08 CONTRACTOR'S USE OF PREMISES

- A. If unoccupied and only with District's prior written approval, Contractor may use the building(s) at the Project Site without limitation for its operations, storage, and office facilities for the performance of the Work. If the District chooses to beneficially occupy any building(s), Contractor must obtain the District's written approval for Contractor's use of spaces and types of

operations to be performed within the building(s) while so occupied. Contractor's access to the building(s) shall be limited to the areas indicated.

- B. If the space at the Project Site is not sufficient for Contractor's operations, storage, office facilities and/or parking, Contractor shall arrange and pay for any additional facilities needed by Contractor.
- C. Contractor shall not interfere with use of or access to occupied portions of the building(s) or adjacent property.
- D. Contractor shall maintain corridors, stairs, halls, and other exit-ways of building clear and free of debris and obstructions at all times.
- E. No one other than those directly involved in the demolition and construction, or specifically designated by the District or the Architect shall be permitted in the areas of work during demolition and construction activities.
- F. The Contractor shall install the construction fence and maintain that it will be locked when not in use. Keys to this fencing will be provided to the District.

1.09 PROTECTION OF EXISTING STRUCTURES AND UTILITIES

- A. The Drawings show above-grade and below-grade structures, utility lines, and other installations that are known or believed to exist in the area of the Work. Contractor shall locate these existing installations before proceeding with excavation and other operations that could damage same; maintain them in service, where appropriate; and repair damage to them caused by the performance of the Work. Should damage occur to these existing installations, the costs of repair shall be at the Contractor's expense and made to the District's satisfaction.
- B. Contractor shall be alert to the possibility of the existence of additional structures and utilities. If Contractor encounters additional structures and utilities, Contractor will immediately report to the District for disposition of same as indicated in the General Conditions.

1.10 UTILITY SHUTDOWNS AND INTERRUPTIONS

- A. Contractor shall give the District a minimum of three (3) days written notice in advance of any need to shut off existing utility services or to effect equipment interruptions. The District will set exact time and duration for shutdown, and will assist Contractor with shutdown. Work required to re-establish utility services shall be performed by the Contractor.
- B. Contractor shall obtain District's written approval as indicated in the General Conditions in advance of deliveries of material or equipment or other activities that may conflict with District's use of the building(s) or adjacent facilities.

1.11 STRUCTURAL INTEGRITY

- A. Contractor shall be responsible for and supervise each operation and work that could affect structural integrity of various building elements, both permanent and temporary.

- B. Contractor shall include structural connections and fastenings as indicated or required for complete performance of the Work.

PART 2 – PRODUCTS Not Used.

PART 3 – EXECUTION Not Used.

END OF DOCUMENT

ALLOWANCE

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Non-specified work.

1.2 RELATED SECTIONS

A. Document 01 10 00 (Summary of Work)

B. Document 01 29 00 (Application for Payment)

C. Document 01 33 00 (Submittal Procedures)

1.3 ALLOWANCES

- A. Included in the Contract, a stipulated sum/price of **[INSERT AMOUNT]** as an allowance for DSA Revisions within the limits set forth in the Contract Documents. This Allowance shall not be utilized without written approval by the District.
- B. Contractor's costs, without overhead and profit, for products, delivery, installation, labor, insurance, payroll, taxes, bonding and equipment rental will be included in Allowance Expenditure Directive authorizing expenditure of funds from this Allowance. No overhead and profit shall be added to the Allowance Expenditure Directive.
- C. Funds will be drawn from Allowance only with District approval evidenced by an Allowance Expenditure Directive.
- D. At Contract closeout, funds remaining in Allowance will be credited to District by Change Order.
- E. Whenever costs are more than the Allowance, the amount covered by the Allowance will be approved at cost. The Contract Price shall be adjusted by Change Order for amounts in excess of the Allowance.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

END OF DOCUMENT

PRODUCT OPTIONS AND SUBSTITUTIONS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. Instructions to Bidders;
- B. General Conditions, including, without limitation, Substitutions For Specified Items; and
- C. Special Conditions.

1.02 SUBSTITUTIONS OF MATERIALS AND EQUIPMENT

- A. Catalog numbers and specific brands or trade names followed by the designation "or equal" are used in conjunction with material and equipment required by the Specifications to establish the standards of quality, utility, and appearance required. Substitutions which are equal in quality, utility, and appearance to those specified may be reviewed subject to the provisions of the General Conditions.
- B. Wherever more than one manufacturer's product is specified, the first-named product is the basis for the design used in the work and the use of alternative-named manufacturers' products or substitutes may require modifications in that design. If such alternatives are proposed by Contractor and are approved by the District and/or the Architect, Contractor shall assume all costs required to make necessary revisions and modifications of the design resulting from the substitutions requested by the Contractor.
- C. When materials and equipment are specified by first manufacturer's name and product number, second manufacturer's name and "or approved equal," supporting data for the second product, if proposed by Contractor, shall be submitted in accordance with the requirements for substitutions. The District's Board has found and determined that certain item(s) shall be used on this Project based on the purpose(s) indicated pursuant to Public Contract Code section 3400(c). These findings, as well as the products and brand or trade names, have been identified in the Notice to Bidders.
- D. The Contractor will not be allowed to substitute specified items unless the request for substitution is submitted as follows:
 - (1) District must receive any notice of request for substitution of a specified item a minimum of ten (10) calendar days prior to bid opening.

- (2) Within 35 days after the date of the Notice of Award, the Contractor shall submit data substantiating the request(s) for all substitution(s) containing sufficient information to assess acceptability of product or system and impact on Project, including, without limitation, the requirements specified in the Special Conditions and the technical Specifications. Insufficient information shall be grounds for rejection of substitution.
- E. If the District and/or Architect, in reviewing proposed substitute materials and equipment, require revisions or corrections to be made to previously accepted Shop Drawings and supplemental supporting data to be resubmitted, Contractor shall promptly do so. If any proposed substitution is judged by the District and/or Architect to be unacceptable, the specified material or equipment shall be provided.
- F. Samples may be required. Tests required by the District and/or Architect for the determination of quality and utility shall be made at the expense of Contractor, with acceptance of the test procedure first given by the District.
- G. In reviewing the supporting data submitted for substitutions, the District and/or Architect will use for purposes of comparison all the characteristics of the specified material or equipment as they appear in the manufacturer's published data even though all the characteristics may not have been particularly mentioned in the Contract Documents. If more than two (2) submissions of supporting data are required, the cost of reviewing the additional supporting data shall be borne by Contractor, and the District will deduct the costs from the Contract Price. The Contractor shall be responsible for any re-design costs occasioned by District's acceptance and/or approval of any substitute.
- H. The Contractor shall, in the event that a substitute is less costly than that specified, credit the District with one hundred percent (100%) of the net difference between the substitute and the originally specified material. In this event, the Contractor agrees to execute a deductive Change Order to reflect that credit. In the event Contractor furnishes a material, process, or article more expensive than that specified, the difference in the cost of that material, process, or article so furnished shall be borne by Contractor.
- I. In no event shall the District be liable for any increase in Contract Price or Contract Time due to any claimed delay in the evaluation of any proposed substitute or in the acceptance or rejection of any proposed substitute.

PART 2 – PRODUCTS Not Used.

PART 3 – EXECUTION Not Used.

END OF DOCUMENT

DOCUMENT 01 26 00

CHANGES IN THE WORK

CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE PROVISIONS IN THE AGREEMENT, GENERAL CONDITIONS, AND SPECIAL CONDITIONS, IF USED, RELATED TO CHANGES AND/OR REQUESTS FOR CHANGES.

END OF DOCUMENT

DOCUMENT 01 29 00

**APPLICATION FOR PAYMENT AND
CONDITIONAL AND UNCONDITIONAL WAIVER AND RELEASE FORMS**

**CONTRACTOR SHALL COMPLY WITH ALL PROVISIONS IN THE GENERAL
CONDITIONS RELATED TO APPLICATIONS FOR PAYMENT AND/OR PAYMENTS.**

**CONDITIONAL WAIVER AND RELEASE
ON PROGRESS PAYMENT
(CIVIL CODE SECTION 8132)**

NOTICE: THIS DOCUMENT WAIVES THE CLAIMANT'S LIEN, STOP PAYMENT NOTICE, AND PAYMENT BOND RIGHTS EFFECTIVE ON RECEIPT OF PAYMENT. A PERSON SHOULD NOT RELY ON THIS DOCUMENT UNLESS SATISFIED THAT THE CLAIMANT HAS RECEIVED PAYMENT.

Name of Claimant: _____

Name of Customer: _____

Job Location: _____

Owner: _____

Through Date: _____

Conditional Waiver and Release

This document waives and releases lien, stop payment notice, and payment bond rights the claimant has for labor and service provided, and equipment and material delivered, to the customer on this job through the Through Date of this document. Rights based upon labor or service provided, or equipment or material delivered, pursuant to a written change order that has been fully executed by the parties prior to the date that this document is signed by the claimant, are waived and released by this document, unless listed as an Exception below. This document is effective only on the claimant's receipt of payment from the financial institution on which the following check is drawn:

Maker of Check: _____

Amount of Check: \$_____

Check Payable to: _____

Exceptions

This document does not affect any of the following:

- (1) Retentions.
- (2) Extras for which the claimant has not received payment.
- (3) The following progress payments for which the claimant has previously given a conditional waiver and release but has not received payment:

Date(s) of waiver and release: _____

Amount(s) of unpaid progress payment(s): \$_____

TRACY UNIFIED SCHOOL DISTRICT

**APPLICATION FOR PAYMENT AND
CONDITIONAL AND UNCONDITIONAL
WAIVER AND RELEASE FORMS
DOCUMENT 01 29 00-2**

- (4) Contract rights, including (A) a right based on rescission, abandonment, or breach of contract, and (B) the right to recover compensation for work not compensated by the payment.

Claimant's Signature: _____

Claimant's Title: _____

Date of Signature: _____

**UNCONDITIONAL WAIVER AND RELEASE
ON PROGRESS PAYMENT
(CIVIL CODE SECTION 8134)**

NOTICE TO CLAIMANT: THIS DOCUMENT WAIVES AND RELEASES LIEN, STOP PAYMENT NOTICE, AND PAYMENT BOND RIGHTS UNCONDITIONALLY AND STATES THAT YOU HAVE BEEN PAID FOR GIVING UP THOSE RIGHTS. THIS DOCUMENT IS ENFORCEABLE AGAINST YOU IF YOU SIGN IT, EVEN IF YOU HAVE NOT BEEN PAID. IF YOU HAVE NOT BEEN PAID, USE A CONDITIONAL WAIVER AND RELEASE FORM.

Name of Claimant: _____

Name of Customer: _____

Job Location: _____

Owner: _____

Through Date: _____

Unconditional Waiver and Release

This document waives and releases lien, stop payment notice, and payment bond rights the claimant has for labor and service provided, and equipment and material delivered, to the customer on this job through the Through Date of this document. Rights based upon labor or service provided, or equipment or material delivered, pursuant to a written change order that has been fully executed by the parties prior to the date that this document is signed by the claimant, are waived and released by this document, unless listed as an Exception below. The claimant has received the following progress payment: \$_____

Exceptions

This document does not affect any of the following:

- (1) Retentions.
- (2) Extras for which the claimant has not received payment.
- (3) Contract rights, including (A) a right based on rescission, abandonment, or breach of contract, and (B) the right to recover compensation for work not compensated by the payment.

Claimant's Signature: _____

Claimant's Title: _____

Date of Signature: _____

**CONDITIONAL WAIVER AND RELEASE
ON FINAL PAYMENT
(CIVIL CODE SECTION 8136)**

NOTICE: THIS DOCUMENT WAIVES THE CLAIMANT'S LIEN, STOP PAYMENT NOTICE, AND PAYMENT BOND RIGHTS EFFECTIVE ON RECEIPT OF PAYMENT. A PERSON SHOULD NOT RELY ON THIS DOCUMENT UNLESS SATISFIED THAT THE CLAIMANT HAS RECEIVED PAYMENT.

Name of Claimant: _____

Name of Customer: _____

Job Location: _____

Owner: _____

Conditional Waiver and Release

This document waives and releases lien, stop payment notice, and payment bond rights the claimant has for labor and service provided, and equipment and material delivered, to the customer on this job. Rights based upon labor or service provided, or equipment or material delivered, pursuant to a written change order that has been fully executed by the parties prior to the date that this document is signed by the claimant, are waived and released by this document, unless listed as an Exception below. This document is effective only on the claimant's receipt of payment from the financial institution on which the following check is drawn:

Maker of Check:

Amount of Check: \$_____

Check Payable to: _____

Exceptions

This document does not affect any of the following: _____

Disputed claims for extras in the amount of: \$_____

Claimant's Signature: _____

Claimant's Title: _____

Date of Signature: _____

**UNCONDITIONAL WAIVER AND RELEASE
ON FINAL PAYMENT**
(CIVIL CODE SECTION 8138)

NOTICE TO CLAIMANT: THIS DOCUMENT WAIVES AND RELEASES LIEN, STOP PAYMENT NOTICE, AND PAYMENT BOND RIGHTS UNCONDITIONALLY AND STATES THAT YOU HAVE BEEN PAID FOR GIVING UP THOSE RIGHTS. THIS DOCUMENT IS ENFORCEABLE AGAINST YOU IF YOU SIGN IT, EVEN IF YOU HAVE NOT BEEN PAID. IF YOU HAVE NOT BEEN PAID, USE A CONDITIONAL WAIVER AND RELEASE FORM.

Name of Claimant: _____

Name of Customer: _____

Job Location: _____

Owner: _____

Unconditional Waiver and Release

This document waives and releases lien, stop payment notice, and payment bond rights the claimant has for all labor and service provided, and equipment and material delivered, to the customer on this job. Rights based upon labor or service provided, or equipment or material delivered, pursuant to a written change order that has been fully executed by the parties prior to the date that this document is signed by the claimant, are waived and released by this document, unless listed as an Exception below. The claimant has been paid in full.

Exceptions

This document does not affect any of the following: _____

Disputed claims for extras in the amount of: \$_____

Claimant's Signature: _____

Claimant's Title: _____

Date of Signature: _____

PROJECT MEETINGS

PART 1 – GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions; and
- B. Special Conditions.

1.02 PROGRESS MEETINGS:

- A. Contractor shall schedule and hold regular weekly progress meetings after a minimum of one week's prior written notice of the meeting date and time to all Invitees as indicated below.
- B. Location: Contractor's field office.
- C. The Contractor shall notify and invite the following entities ("Invitees"):
 - (1) District Representative.
 - (2) Contractor.
 - (3) Contractor's Project Manager.
 - (4) Contractor's Superintendent.
 - (5) Subcontractors, as appropriate to the agenda of the meeting.
 - (6) Suppliers, as appropriate to the agenda of the meeting.
 - (7) Construction Manager, if any.
 - (8) Architect
 - (9) Engineer(s), if any and as appropriate to the agenda of the meeting.
 - (10) Others, as appropriate to the agenda of the meeting.
- D. The District's and/or the Architect's Consultants will attend at their discretion, in response to the agenda.
- E. The District representative, the Construction Manager, and/or another District Agent shall take and distribute meeting notes to attendees and other concerned parties. If exceptions are taken to anything in the meeting notes,

those exceptions shall be stated in writing to the District within five (5) working days following District's distribution of the meeting notes.

1.03 PRE-INSTALLATION/PERFORMANCE MEETING:

- A. Contractor shall schedule a meeting prior to the start of each of the demolition work phases. Contractor shall invite all Invitees to this meeting, and others whose work may affect or be affected by the quality of the demolition work.
- B. Contractor shall review in detail prior to this meeting, the manufacturer's requirements and specifications, applicable portions of the Contract Documents, Shop Drawings, and other submittals, and other related work. At this meeting, invitees shall review and resolve conflicts, incompatibilities, or inadequacies discovered or anticipated.
- C. Contractor shall review in detail Project conditions, schedule, requirements for performance, application, installation, and quality of completed Work, and protection of adjacent Work and property.
- D. Contractor shall review in detail means of protecting the completed Work during the remainder of the construction period.

PART 2 - PRODUCTS Not Used.

PART 3 - EXECUTION Not Used.

END OF DOCUMENT

SCHEDULING OF WORK

PART 1 – GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions;
- B. Special Conditions;
- C. Summary of Work; and
- D. Submittals.

1.02 SECTION INCLUDES

- A. Scheduling of Work under this Contract shall be performed by Contractor in accordance with requirements of this Section.
 - (1) Development of schedule, cost and resource loading of the schedule, monthly payment requests, and project status reporting requirements of the Contract shall employ computerized Critical Path Method ("CPM") scheduling ("CPM Schedule").
 - (2) CPM Schedule shall be cost loaded based on Schedule of Values as approved by District.
 - (3) Submit schedules and reports as specified in the General Conditions.
- B. Upon Award of Contract, Contractor shall immediately commence development of Initial and Original CPM Schedules to ensure compliance with CPM Schedule submittal requirements.

1.03 CONSTRUCTION SCHEDULE

- A. Within ten (10) days of issuance of the issuance Notice to Proceed and before request for first progress payment, the Contractor shall prepare and submit to the Project Manager a construction progress schedule conforming to the Milestone Schedule below.
- B. The Construction Schedule shall be continuously updated, and an updated schedule shall be submitted with each application for progress payment. Each revised schedule shall indicate the work actually accomplished during the previous period and the schedule for completion of the remaining work.

C. Milestone Schedule:

ACTIVITY DESCRIPTION

REQUIRED COMPLETION

CONSTRUCTION STARTS

05-26-2022

PHASE 1 DEMOLITION

PHASE 2 DEMOLITION

FINAL PROJECT COMPLETION

1.04 QUALIFICATIONS

- A. Contractor shall employ experienced scheduling personnel qualified to use the latest version of [i.e., Primavera Project Planner]. Experience level required is set forth below. Contractor may employ such personnel directly or may employ a consultant for this purpose.
- (1) The written statement shall identify the individual who will perform CPM scheduling.
 - (2) Capability and experience shall be verified by description of construction projects on which individual has successfully applied computerized CPM.
 - (3) Required level of experience shall include at least two (2) projects of similar nature and scope with value not less than three fourths ($\frac{3}{4}$) of the Total Bid Price of this Project. The written statement shall provide contact persons for referenced projects with current telephone and address information.
- B. District reserves the right to approve or reject Contractor's scheduler or consultant at any time. District reserves the right to refuse replacing of Contractor's scheduler or consultant, if District believes replacement will negatively affect the scheduling of Work under this Contract.

1.05 GENERAL

- A. Progress Schedule shall be based on and incorporate milestone and completion dates specified in Contract Documents.
- B. Overall time of completion and time of completion for each milestone shown on Progress Schedule shall adhere to times in the Contract, unless an earlier (advanced) time of completion is requested by Contractor and agreed to by District. Any such agreement shall be formalized by a Change Order.
- (1) District is not required to accept an early completion schedule, i.e., one that shows an earlier completion date than the Contract Time.
 - (2) Contractor shall not be entitled to extra compensation in event agreement is reached on an earlier completion schedule and Contractor completes its Work, for whatever reason, beyond completion date shown in its early completion schedule but within the Contract Time.

- (3) A schedule showing the work completed in less than the Contract Time, and that has been accepted by District, shall be considered to have Project Float. The Project Float is the time between the scheduled completion of the work and the Completion Date. Project Float is a resource available to both District and the Contractor.
- C. Ownership Project Float: Neither the District nor Contractor owns Project Float. The Project owns the Project Float. As such, liability for delay of the Completion Date rests with the party whose actions, last in time, actually cause delay to the Completion Date.
 - (1) For example, if Party A uses some, but not all of the Project Float and Party B later uses remainder of the Project Float as well as additional time beyond the Project Float, Party B shall be liable for the time that represents a delay to the Completion Date.
 - (2) Party A would not be responsible for the time since it did not consume the entire Project Float and additional Project Float remained; therefore, the Completion Date was unaffected by Party A.
- D. Progress Schedule shall be the basis for evaluating job progress, payment requests, and time extension requests. Responsibility for developing Contract CPM Schedule and monitoring actual progress as compared to Progress Schedule rests with Contractor.
- E. Failure of Progress Schedule to include any element of the Work, or any inaccuracy in Progress Schedule, will not relieve Contractor from responsibility for accomplishing the Work in accordance with the Contract. District's acceptance of schedule shall be for its use in monitoring and evaluating job progress, payment requests, and time extension requests and shall not, in any manner, impose a duty of care upon District, or act to relieve Contractor of its responsibility for means and methods of construction.
- F. Software: Use [i.e, District Project Planner for Windows, latest version]. Such software shall be compatible with Windows operating system. Contractor shall transmit contract file to District on compact disk at times requested by District.
- G. Transmit each item under the form approved by District.
 - (1) Identify Project with District Contract number and name of Contractor.
 - (2) Provide space for Contractor's approval stamp and District's review stamps.
 - (3) Submittals received from sources other than Contractor will be returned to the Contractor without District's review.

1.06 INITIAL CPM SCHEDULE

- A. Initial CPM Schedule submitted for review at the pre-construction conference shall serve as Contractor's schedule for up to ninety (90) calendar days after the Notice to Proceed.

- B. Indicate detailed plan for the Work to be completed in first ninety (90) days of the Contract; details of planned mobilization of plant and equipment; sequence of early operations; procurement of materials and equipment. Show Work beyond ninety (90) calendar days in summary form.
- C. Initial CPM Schedule shall be time scaled.
- D. Initial CPM Schedule shall be cost and resource loaded. Accepted cost and resource loaded schedule will be used as basis for monthly progress payments until acceptance of the Original CPM Schedule. Use of Initial CPM Schedule for progress payments shall not exceed ninety (90) calendar days.
- E. District and Contractor shall meet to review and discuss the Initial CPM Schedule within seven (7) calendar days after it has been submitted to District.
 - (1) District's review and comment on the schedule shall be limited to Contract conformance (with sequencing, coordination, and milestone requirements).
 - (2) Contractor shall make corrections to schedule necessary to comply with Contract requirements and shall adjust schedule to incorporate any missing information requested by District. Contractor shall resubmit Initial CPM Schedule if requested by District.
- F. If, during the first ninety (90) days after Notice to Proceed, the Contractor is of the opinion that any of the Work included on its Initial CPM Schedule has been impacted, the Contractor shall submit to District a written Time Impact Evaluation ("TIE") in accordance with Article 1.12 of this Section. The TIE shall be based on the most current update of the Initial CPM Schedule.

1.07 ORIGINAL CPM SCHEDULE

- A. Submit a detailed proposed Original CPM Schedule presenting an orderly and realistic plan for completion of the Work in conformance with requirements as specified herein.
- B. Progress Schedule shall include or comply with following requirements:
 - (1) Time scaled, cost and resource (labor and major equipment) loaded CPM schedule.
 - (2) No activity on schedule shall have duration longer than fifteen (15) work days, with exception of submittal, approval, fabrication and procurement activities, unless otherwise approved by District.
 - (a) Activity durations shall be total number of actual work days required to perform that activity.
 - (3) The start and completion dates of all items of Work, their major components, and milestone completion dates, if any.

- (4) District furnished materials and equipment, if any, identified as separate activities.
- (5) Activities for maintaining Project Record Documents.
- (6) Dependencies (or relationships) between activities.
- (7) Processing/approval of submittals and shop drawings for all material and equipment required per the Contract. Activities that are dependent on submittal acceptance or material delivery shall not be scheduled to start earlier than expected acceptance or delivery dates.
 - (a) Include time for submittals, re-submittals and reviews by District. Coordinate with accepted schedule for submission of Shop Drawings, samples, and other submittals.
 - (b) Contractor shall be responsible for all impacts resulting from re-submittal of Shop Drawings and submittals.
- (8) Procurement of major equipment, through receipt and inspection at jobsite, identified as separate activity.
 - (a) Include time for fabrication and delivery of manufactured products for the Work.
 - (b) Show dependencies between procurement and construction.
- (9) Activity description; what Work is to be accomplished and where.
- (10) The total cost of performing each activity shall be total of labor, material, and equipment, excluding overhead and profit of Contractor. Overhead and profit of the General Contractor shall be shown as a separate activity in the schedule. Sum of cost for all activities shall equal total Contract value.
- (11) Resources required (labor and major equipment) to perform each activity.
- (12) Responsibility code for each activity corresponding to Contractor or Subcontractor responsible for performing the Work.
- (13) Identify the activities which constitute the controlling operations or critical path. No more than twenty-five (25%) of the activities shall be critical or near critical. Near critical is defined as float in the range of one (1) to (10) days.
- (14) Twenty (20) workdays for developing punch list(s), completion of punch-list items, and final clean up for the Work or any designated portion thereof. No other activities shall be scheduled during this period.
- (15) Interface with the work of other contractors, District, and agencies such as, but not limited to, utility companies.

- (16) Show detailed Subcontractor Work activities. In addition, furnish copies of Subcontractor schedules upon which CPM was built.
 - (a) Also furnish for each Subcontractor, as determined by District, submitted on Subcontractor letterhead, a statement certifying that Subcontractor concurs with Contractor's Original CPM Schedule and that Subcontractor's related schedules have been incorporated, including activity duration, cost and resource loading.
 - (b) Subcontractor schedules shall be independently derived and not a copy of Contractor's schedule.
 - (c) In addition to Contractor's schedule and resource loading, obtain from electrical, mechanical, and plumbing Subcontractors, and other Subcontractors as required by District, productivity calculations common to their trades, such as units per person day, feet of pipe per day per person, feet of wiring per day per person, and similar information.
 - (d) Furnish schedule for Contractor/Subcontractor CPM schedule meetings which shall be held prior to submission of Original CPM schedule to District. District shall be permitted to attend scheduled meetings as an observer.
- (17) Activity durations shall be in Work days.
- (18) Submit with the schedule a list of anticipated non-Work days, such as weekends and holidays. The Progress Schedule shall exclude in its Work day calendar all non-Work days on which Contractor anticipates critical Work will not be performed.
- C. Original CPM Schedule Review Meeting: Contractor shall, within sixty (60) days from the Notice to Proceed date, meet with District to review the Original CPM Schedule submittal.
 - (1) Contractor shall have its Project Manager, Project Superintendent, Project Scheduler, and key Subcontractor representatives, as required by District, in attendance. The meeting will take place over a continuous one (1) day period.
 - (2) District's review will be limited to submittal's conformance to Contract requirements including, but not limited to, coordination requirements. However, review may also include:
 - (a) Clarifications of Contract Requirements.
 - (b) Directions to include activities and information missing from submittal.
 - (c) Requests to Contractor to clarify its schedule.

- (3) Within five (5) days of the Schedule Review Meeting, Contractor shall respond in writing to all questions and comments expressed by District at the Meeting.

1.08 ADJUSTMENTS TO CPM SCHEDULE

- A. Adjustments to Original CPM Schedule: Contractor shall have adjusted the Original CPM Schedule submittal to address all review comments from original CPM Schedule review meeting and resubmit network diagrams and reports for District's review.
 - (1) District, within ten (10) days from date that Contractor submitted the revised schedule, will either:
 - (a) Accept schedule and cost and resource loaded activities as submitted, or
 - (b) Advise Contractor in writing to review any part or parts of schedule which either do not meet Contract requirements or are unsatisfactory for District to monitor Project's progress, resources, and status or evaluate monthly payment request by Contractor.
 - (2) District may accept schedule with conditions that the first monthly CPM Schedule update be revised to correct deficiencies identified.
 - (3) When schedule is accepted, it shall be considered the "Original CPM Schedule" which will then be immediately updated to reflect the current status of the work.
 - (4) District reserves right to require Contractor to adjust, add to, or clarify any portion of schedule which may later be discovered to be insufficient for monitoring of Work or approval of partial payment requests. No additional compensation will be provided for such adjustments, additions, or clarifications.
- B. Acceptance of Contractor's schedule by District will be based solely upon schedule's compliance with Contract requirements.
 - (1) By way of Contractor assigning activity durations and proposing sequence of Work, Contractor agrees to utilize sufficient and necessary management and other resources to perform work in accordance with the schedule.
 - (2) Upon submittal of schedule update, updated schedule shall be considered "current" CPM Schedule.
 - (3) Submission of Contractor's schedule to District shall not relieve Contractor of total responsibility for scheduling, sequencing, and pursuing Work to comply with requirements of Contract Documents, including adverse effects such as delays resulting from ill-timed Work.

- C. Submittal of Original CPM Schedule, and subsequent schedule updates, shall be understood to be Contractor's representation that the Schedule meets requirements of Contract Documents and that Work shall be executed in sequence indicated on the schedule.
- D. Contractor shall distribute Original CPM Schedule to Subcontractors for review and written acceptance, which shall be noted on Subcontractors' letterheads to Contractor and transmitted to District for the record.

1.09 MONTHLY CPM SCHEDULE UPDATE SUBMITTALS

- A. Following acceptance of Contractor's Original CPM Schedule, Contractor shall monitor progress of Work and adjust schedule each month to reflect actual progress and any anticipated changes to planned activities.
 - (1) Each schedule update submitted shall be complete, including all information requested for the Original CPM Schedule submittal.
 - (2) Each update shall continue to show all Work activities including those already completed. These completed activities shall accurately reflect "as built" information by indicating when activities were actually started and completed.
- B. A meeting will be held on approximately the twenty-fifth (25th) of each month to review the schedule update submittal and progress payment application.
 - (1) At this meeting, at a minimum, the following items will be reviewed: Percent (%) complete of each activity; Time Impact Evaluations for Change Orders and Time Extension Request; actual and anticipated activity sequence changes; actual and anticipated duration changes; and actual and anticipated Contractor delays.
 - (2) These meetings are considered a critical component of overall monthly schedule update submittal and Contractor shall have appropriate personnel attend. At a minimum, these meetings shall be attended by Contractor's General Superintendent and Scheduler.
 - (3) Contractor shall plan on the meeting taking no less than four (4) hours.
- C. Within five (5) working days after monthly schedule update meeting, Contractor shall submit the updated CPM Schedule update.
- D. Within five (5) work days of receipt of above noted revised submittals, District will either accept or reject monthly schedule update submittal.
 - (1) If accepted, percent (%) complete shown in monthly update will be basis for Application for Payment by the Contractor. The schedule update shall be submitted as part of the Contractor's Application for Payment.

- (2) If rejected, update shall be corrected and resubmitted by Contractor before the Application for Payment is submitted.
- E. Neither updating, changing or revising of any report, curve, schedule, or narrative submitted to District by Contractor under this Contract, nor District's review or acceptance of any such report, curve, schedule or narrative shall have the effect of amending or modifying in any way the Completion Date or milestone dates or of modifying or limiting in any way Contractor's obligations under this Contract.

1.10 SCHEDULE REVISIONS

- A. Updating the Schedule to reflect actual progress shall not be considered revisions to the Schedule. Since scheduling is a dynamic process, revisions to activity durations and sequences are expected on a monthly basis.
- B. To reflect revisions to the Schedule, the Contractor shall provide District with a written narrative with a full description and reasons for each Work activity revised. For revisions affecting the sequence of work, the Contractor shall provide a schedule diagram which compares the original sequence to the revised sequence of work. The Contractor shall provide the written narrative and schedule diagram for revisions two (2) working days in advance of the monthly schedule update meeting.
- C. Schedule revisions shall not be incorporated into any schedule update until the revisions have been reviewed by District. District may request further information and justification for schedule revisions and Contractor shall, within three (3) days, provide District with a complete written narrative response to District's request.
- D. If the Contractor's revision is still not accepted by District, and the Contractor disagrees with District's position, the Contractor has seven (7) calendar days from receipt of District's letter rejecting the revision to provide a written narrative providing full justification and explanation for the revision. The Contractor's failure to respond in writing within seven (7) calendar days of District's written rejection of a schedule revision shall be contractually interpreted as acceptance of District's position, and the Contractor waives its rights to subsequently dispute or file a claim regarding District's position.
- E. At District's discretion, the Contractor can be required to provide Subcontractor certifications of performance regarding proposed schedule revisions affecting said Subcontractors.

1.11 RECOVERY SCHEDULE

- A. If the Schedule Update shows a completion date twenty-one (21) calendar days beyond the Contract Completion Date, or individual milestone completion dates, the Contractor shall submit to District the proposed revisions to recover the lost time within seven (7) calendar days. As part of this submittal, the Contractor shall provide a written narrative for each revision made to recapture the lost time. If the revisions include sequence changes, the Contractor shall provide a schedule diagram comparing the original sequence to the revised sequence of work.

- B. The revisions shall not be incorporated into any schedule update until the revisions have been reviewed by District.
- C. If the Contractor's revisions are not accepted by District, District and the Contractor shall follow the procedures in paragraph 1.09.C, 1.09.D and 1.09.E above.
- D. At District's discretion, the Contractor can be required to provide Subcontractor certifications for revisions affecting said Subcontractors.

1.12 TIME IMPACT EVALUATION ("TIE") FOR CHANGE ORDERS, AND OTHER DELAYS

- A. When Contractor is directed to proceed with changed Work, the Contractor shall prepare and submit within fourteen (14) calendar days from the Notice to Proceed a TIE which includes both a written narrative and a schedule diagram depicting how the changed Work affects other schedule activities. The schedule diagram shall show how the Contractor proposes to incorporate the changed Work in the schedule and how it impacts the current schedule-update critical path. The Contractor is also responsible for requesting time extensions based on the TIE's impact on the critical path. The diagram must be tied to the main sequence of schedule activities to enable District to evaluate the impact of changed Work to the scheduled critical path.
- B. Contractor shall be required to comply with the requirements of Paragraph 1.09.A for all types of delays such as, but not limited to, Contractor/Subcontractor delays, adverse weather delays, strikes, procurement delays, fabrication delays, etc.
- C. Contractor shall be responsible for all costs associated with the preparation of TIEs, and the process of incorporating them into the current schedule update. The Contractor shall provide District with four (4) copies of each TIE.
- D. Once agreement has been reached on a TIE, the Contract Time will be adjusted accordingly. If agreement is not reached on a TIE, the Contract Time may be extended in an amount District allows, and the Contractor may submit a claim for additional time claimed by contractor.

1.13 TIME EXTENSIONS

- A. The Contractor is responsible for requesting time extensions for time impacts that, in the opinion of the Contractor, impact the critical path of the current schedule update. Notice of time impacts shall be given in accord with the General Conditions.
- B. Where an event for which District is responsible impacts the projected Completion Date, the Contractor shall provide a written mitigation plan, including a schedule diagram, which explains how (e.g., increase crew size, overtime, etc.) the impact can be mitigated. The Contractor shall also include a detailed cost breakdown of the labor, equipment, and material the Contractor would expend to mitigate District-caused time impact. The Contractor shall submit its mitigation plan to District within fourteen (14)

calendar days from the date of discovery of the impact. The Contractor is responsible for the cost to prepare the mitigation plan.

- C. Failure to request time, provide TIE, or provide the required mitigation plan will result in Contractor waiving its right to a time extension and cost to mitigate the delay.
- D. No time will be granted under this Contract for cumulative effect of changes.
- E. District will not be obligated to consider any time extension request unless the Contractor complies with the requirements of Contract Documents.
- F. Failure of the Contractor to perform in accordance with the current schedule update shall not be excused by submittal of time extension requests.
- G. If the Contractor does not submit a TIE within the required fourteen (14) calendar days for any issue, it is mutually agreed that the Contractor does not require a time extension for said issue.

1.14 SCHEDULE REPORTS

- A. Submit four (4) copies of the following reports with the Initial CPM Schedule, the Original CPM Schedule, and each monthly update.
- B. Required Reports:
 - (1) Two activity listing reports: one sorted by activity number and one by total Project Float. These reports shall also include each activity's early/late and actual start and finish dates, original and remaining duration, Project Float, responsibility code, and the logic relationship of activities.
 - (2) Cost report sorted by activity number including each activity's associated cost, percentage of Work accomplished, earned value- to date, previous payments, and amount earned for current update period.
 - (3) Schedule plots presenting time-scaled network diagram showing activities and their relationships with the controlling operations or critical path clearly highlighted.
 - (4) Cash flow report calculated by early start, late start, and indicating actual progress. Provide an exhibit depicting this information in graphic form.
 - (5) Planned versus actual resource (i.e., labor) histogram calculated by early start and late start.
- C. Other Reports:

In addition to above reports, District may request, from month to month, any two of the following reports. Submit four (4) copies of all reports.

- (1) Activities by early start.
 - (2) Activities by late start.
 - (3) Activities grouped by Subcontractors or selected trades.
 - (4) Activities with scheduled early start dates in a given time frame, such as fifteen (15) or thirty (30) day outlook.
- D. Furnish District with report files on compact disks containing all schedule files for each report generated.

1.15 PROJECT STATUS REPORTING

- A. In addition to submittal requirements for CPM scheduling identified in this Section, Contractor shall provide a monthly project status report (i.e., written narrative report) to be submitted in conjunction with each CPM Schedule as specified herein. Status reporting shall be in form specified below.
- B. Contractor shall prepare monthly written narrative reports of status of Project for submission to District. Written status reports shall include:
- (1) Status of major Project components (percent (%) complete, amount of time ahead or behind schedule) and an explanation of how Project will be brought back on schedule if delays have occurred.
 - (2) Progress made on critical activities indicated on CPM Schedule.
 - (3) Explanations for any lack of work on critical path activities planned to be performed during last month.
 - (4) Explanations for any schedule changes, including changes to logic or to activity durations.
 - (5) List of critical activities scheduled to be performed next month.
 - (6) Status of major material and equipment procurement.
 - (7) Any delays encountered during reporting period.
 - (8) Contractor shall provide printed report indicating actual versus planned resource loading for each trade and each activity. This report shall be provided on weekly and monthly basis.
 - (a) Actual resource shall be accumulated in field by Contractor, and shall be as noted on Contractor's daily reports. These reports will be basis for information provided in computer-generated monthly and weekly printed reports.
 - (b) Contractor shall explain all variances and mitigation measures.

- (9) Contractor may include any other information pertinent to status of Project. Contractor shall include additional status information requested by District at no additional cost.
- (10) Status reports, and the information contained therein, shall not be construed as claims, notice of claims, notice of delay, or requests for changes or compensation.

1.16 WEEKLY SCHEDULE REPORT

At the Weekly Progress Meeting, the Contractor shall provide and present a time-scaled three (3) week look-ahead schedule that is based and correlated by activity number to the current schedule (i.e., Initial, Original CPM, or Schedule Update).

1.17 DAILY CONSTRUCTION REPORTS

On a daily basis, Contractor shall submit a daily activity report to District for each workday, including weekends and holidays when worked. Contractor shall develop the daily construction reports on a computer-generated database capable of sorting daily Work, manpower, and man-hours by Contractor, Subcontractor, area, sub-area, and Change Order Work. Upon request of District, furnish computer disk of this data base. Obtain District's written approval of daily construction report data base format prior to implementation. Include in report:

- A. Project name and Project number.
- B. Contractor's name and address.
- C. Weather, temperature, and any unusual site conditions.
- D. Brief description and location of the day's scheduled activities and any special problems and accidents, including Work of Subcontractors. Descriptions shall be referenced to CPM scheduled activities.
- E. Worker quantities for its own Work force and for Subcontractors of any tier.
- F. Equipment, other than hand tools, utilized by Contractor and Subcontractors.

1.18 PERIODIC VERIFIED REPORTS

Contractor shall complete and verify construction reports on a form prescribed by the Division of the State Architect and file reports on the first day of February, May, August, and November during the preceding quarter year; at the completion of the Contract; at the completion of the Work; at the suspension of Work for a period of more than one (1) month; whenever the services of Contractor or any of Contractor's Subcontractors are terminated for any reason; and at any time a special verified report is required by the Division of the State Architect. Refer to section 4-336 and section 4-343 of Part 1, Title 24 of the California Code of Regulations.

PART 2 – PRODUCTS Not Used.

PART 3 - EXECUTION Not Used.

END OF DOCUMENT

SUBMITTALS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Contractor's Submittals and Schedules, Drawings and Specifications;
- B. Special Conditions.

1.02 SECTION INCLUDES:

- A. Definitions:
 - (1) Shop Drawings and Product Data are as indicated in the General Conditions and include, but are not limited to, fabrication, erection, layout and setting drawings, formwork and falsework drawings, manufacturers' standard drawings, descriptive literature, catalogues, brochures, performance and test data, wiring and control diagrams. In addition, there are other drawings and descriptive data pertaining to materials, equipment, piping, duct and conduit systems, and methods of construction as may be required to show that the materials, equipment or systems and all positions conform to the requirement of the Contract Documents, including, without limitation, the Drawings.
 - (2) "Manufactured" applies to standard units usually mass-produced; "fabricated" means specifically assembled or made out of selected materials to meet design requirements. Shop Drawings shall establish the actual detail of manufactured or fabricated items, indicated proper relation to adjoining work and amplify design details of mechanical and electrical equipment in proper relation to physical spaces in the structure.
 - (3) Manufacturer's Instructions: Where any item of Work is required by the Contract Documents to be furnished, installed, or performed, at a minimum, in accordance with a specified product manufacturer's instructions, the Contractor shall procure and distribute copies of these to the District, the Architect, and all other concerned parties and shall furnish, install, or perform the work, at a minimum, in accordance with those instructions.
- B. Samples, Shop Drawings, Product Data, and other items as specified, in accordance with the following requirements:
 - (1) Contractor shall submit all Shop Drawings, Product Data, and Samples to the District, the Architect, the Project Inspector, and the Construction Manager.

Contractor to review section
01 3300 as well as this
document

- (2) Contractor shall comply with all time frames herein and in the General Conditions and, in any case, shall submit required information in sufficient time to permit proper consideration and action before ordering any materials or items represented by such Shop Drawings, Product Data, and/or Samples.
- (3) Contractor shall allow sufficient time so that no delay occurs due to required lead time in ordering or delivery of any item to the Site. Contractor shall be responsible for any delay in progress of Work due to its failure to observe these requirements.
- (4) Time for completion of Work shall not be extended on account of Contractor's failure to promptly submit Shop Drawings, Product Data, and/or Samples.
- (5) Reference numbers on Shop Drawings shall have Architectural and/or Engineering Contract Drawings reference numbers for details, sections, and "cuts" shown on Shop Drawings. These reference numbers shall be in addition to any numbering system that Contractor chooses to use or has adopted as standard.
- (6) When the magnitude or complexity of submittal material prevents a complete review within the stated time frame, Contractor shall make this submittal in increments to avoid extended delays.
- (7) Contractor shall certify on submittals for review that submittals conform to Contract requirements. Also certify that Contractor-furnished equipment can be installed in allocated space. In event of any variance, Contractor shall specifically state in transmittal and on Shop Drawings, portions vary and require approval of a substitute. Submittals shall not be used as a means of requesting a substitution.
- (8) Unless specified otherwise, sampling, preparation of samples, and tests shall be in accordance with the latest standard of the American Society for Testing and Materials.
- (9) Upon demand by Architect or District, Contractor shall submit samples of materials and/or articles for tests or examinations and consideration before Contractor incorporates same in Work. Contractor shall be solely responsible for delays due to sample(s) not being submitted in time to allow for tests. Acceptance or rejection will be expressed in writing. Work shall be equal to approved samples in every respect. Samples that are of value after testing will remain the property of Contractor.

C. Submittal Schedule:

- (1) Contractor shall prepare its proposed submittal schedule that is coordinated with the proposed construction schedule and submit both to the District within ten (10) days after the date of the Notice to Proceed. Contractor's proposed schedules shall become the Project Construction Schedule and the Project Submittal Schedule after each is approved by the District.

Contractor to review section
01 3300 as well as this
document

- (2) Contractor is responsible for all lost time should the initial submittal be rejected, marked "revise and resubmit", etc.
- (3) All Submittals shall be forwarded to the District by the date indicated on the approved Submittal Schedule, unless an earlier date is necessary to maintain the Construction Schedule, in which case those Submittals shall be forwarded to the District so as not to delay the Construction Schedule.
- (4) Contractor may be assessed \$100 a day for each day it is late in submitting a shop drawing or sample. No extensions of time will be granted to Trade Contractor or any Subcontractor because of its failure to have shop drawings and samples submitted in accordance with the Schedule.

1.03 SHOP DRAWINGS:

- A. Contractor shall submit one reproducible transparency and six (6) opaque reproductions. The District will review and return the reproducible copy and one (1) opaque reproduction to Contractor.
- B. Before commencing installation of any Work, the Contractor shall submit and receive approval of all drawings, descriptive data, and material list(s) as required to accomplish Work.
- C. Review of Shop Drawings is regarded as a service to assist Contractor and in all cases original Contract Documents shall take precedence as outlined under General Conditions.
- D. No claim for extra time or payment shall be based on work shown on Shop Drawings unless the claim is (1) noted on Contractor's transmittal letter accompanying Shop Drawings and (2) Contractor has complied with all applicable provisions of the General Conditions, including, without limitation, provisions regarding changes and payment, and all required written approvals.
- E. District shall not review Shop Drawings for quantities of materials or number of items supplied.
- F. District's and/or Architect's review of Shop Drawing will be general. District and/or Architect review does not relieve Contractor of responsibility for dimensions, accuracy, proper fitting, construction of Work, furnishing of materials, or Work required by Contract Documents and not indicated on Shop Drawings. The District's and/or Architect's review of Shop Drawings is not to be construed as approving departures from Contract Documents.
- G. Review of Shop Drawings and Schedules does not relieve Contractor from responsibility for any aspect of those Drawings or Schedules that is a violation of local, County, State, or Federal laws, rules, ordinances, or rules and regulations of commissions, boards, or other authorities or utilities having jurisdiction.
- H. Before submitting Shop Drawings for review, Contractor shall check Shop Drawings of its subcontractors for accuracy, and confirm that all Work

Contractor to review section
01 3300 as well as this
document

contiguous with and having bearing on other work shown on Shop Drawings is accurately drawn and in conformance with Contract Documents.

- I. Submitted drawings and details must bear stamp of approval of Contractor:
 - (1) Stamp and signature shall clearly certify that Contractor has checked Shop Drawings for compliance with Drawings.
 - (2) If Contractor submits a Shop Drawing without an executed stamp of approval, or whenever it is evident (despite stamp) that Drawings have not been checked, the District and/or Architect will not consider them and will return them to the Contractor for revision and resubmission. In that event, it will be deemed that Contractor has not complied with this provision and Contractor shall bear risk of all delays to same extent as if it had not submitted any Shop Drawings or details.
- J. Submission of Shop Drawings (in either original submission or when resubmitted with correction) constitutes evidence that Contractor has checked all information thereon and that it accepts and is willing to perform Work as shown.
- K. Contractor shall pay for cost of any changes in construction due to improper checking and coordination. Contractor shall be responsible for all additional costs, including coordination. Contractor shall be responsible for costs incurred by itself, the District, the Architect, the Project Inspector, the Construction Manager, any other Subcontractor or contractor, etc., due to improperly checked and/or coordination of submittals.
- L. Shop Drawings must clearly delineate the following information:
 - (1) Project name and address.
 - (2) Specification number and description.
 - (3) Architect's name and project number.
 - (4) Shop Drawing title, number, date, and scale.
 - (5) Names of Contractor, Subcontractor(s) and fabricator.
 - (6) Working and erection dimensions.
 - (7) Arrangements and sectional views.
 - (8) Necessary details, including complete information for making connections with other Work.
 - (9) Kinds of materials and finishes.
 - (10) Descriptive names of materials and equipment, classified item numbers, and locations at which materials or equipment are to be installed in the Work. Contractor shall use same reference identification(s) as shown on Contract Drawings.

Contractor to review section
01 3300 as well as this
document

- M. Contractor shall prepare composite drawings and installation layouts when required to solve tight field conditions.
 - (1) Shop Drawings shall consist of dimensioned plans and elevations and must give complete information, particularly as to size and location of sleeves, inserts, attachments, openings, conduits, ducts, boxes, structural interferences, etc.
 - (2) Contractor shall coordinate these composite Shop Drawings and installation layouts in the field between itself and its Subcontractor(s) for proper relationship to the Work, the work of other trades, and the field conditions. The Contractor shall check and approve all submittal(s) before submitting them for final review.

1.04 PRODUCT DATA OR NON REPRODUCIBLE SUBMITTALS:

- A. Contractor shall submit manufacturer's printed literature in original form. Any fading type of reproduction will not be accepted. Contractor must submit a minimum of six (6) each, to the District. District shall return one (1) to the Contractor, who shall reproduce whatever additional copies it requires for distribution.
- B. Contractor shall submit six (6) copies of a complete list of all major items of mechanical, plumbing, and electrical equipment and materials in accordance with the approved Submittal Schedule, except as required earlier to comply with the approved Construction Schedule. Other items specified are to be submitted prior to commencing Work. Contractor shall submit items of like kind at one time in a neat and orderly manner. Partial lists will not be acceptable.
- C. Submittals shall include manufacturer's specifications, physical dimensions, and ratings of all equipment. Contractor shall furnish performance curves for all pumps and fans. Where printed literature describes items in addition to that item being submitted, submitted item shall be clearly marked on sheet and superfluous information shall be crossed out. If highlighting is used, Contractor shall mark all copies.
- D. Equipment submittals shall be complete and include space requirements, weight, electrical and mechanical requirements, performance data, and supplemental information that may be requested.
- E. Imported Materials Certification must be submitted at least ten (10) days before material is delivered.

1.05 SAMPLES:

- A. Contractor shall submit for approval Samples as required and within the time frame in the Contract Documents. Materials such as concrete, mortar, etc., which require on-site testing will be obtained from Project Site.
- B. Contractor shall submit four (4) samples except where greater or lesser number is specifically required by Contract Documents including, without limitation, the Specifications.

Contractor to review section
01 3300 as well as this
document

- (1) Samples must be of sufficient size and quality to clearly illustrate functional characteristics, with integrally related parts and attachment devices.
 - (2) Samples must show full range of texture, color, and pattern.
- C. Contractor shall make all Submittals, unless it has authorized Subcontractor(s) to submit and Contractor has notified the District in writing to this effect.
- D. Samples to be shipped prepaid or hand-delivered to the District.
- E. Contractor shall mark samples to show name of Project, name of Contractor submitting, Contract number and segment of Work where representative Sample will be used, all applicable Specifications Sections and documents, Contract Drawing Number and detail, and ASTM or FS reference, if applicable.
- F. Contractor shall not deliver any material to Site prior to receipt of District's and/or Architect's completed written review and approval. Contractor shall furnish materials equal in every respect to approved Samples and execute Work in conformance therewith.
- G. District's and/or Architect's review, acceptance, and/or approval of Sample(s) will not preclude rejections of any material upon discovery of defects in same prior to final acceptance of completed Work.
- H. After a material has been approved, no change in brand or make will be permitted.
- I. Contractor shall prepare its Submittal Schedule and submit Samples of materials requiring laboratory tests to specified laboratory for testing not less than ninety (90) days before such materials are required to be used in Work.
- J. Samples which are rejected must be resubmitted promptly after notification of rejection and be marked "Resubmitted Sample" in addition to other information required.
- K. Field Samples and Mock-Ups are to be removed by Contractor at District's direction:
 - (1) Size: As Specified.
 - (2) Furnish catalog numbers and similar data, as requested.

1.06 REVIEW AND RESUBMISSION REQUIREMENTS:

- A. The District will arrange for review of Sample(s), Shop Drawing(s), Product Data, and other submittal(s) by appropriate reviewer and return to Contractor as provided below within twenty-one (21) days after receipt or within twenty-one (21) days after receipt of all related information necessary for such review, whichever is later.
- B. One (1) copy of product or materials data will be returned to Contractor with the review status.

Contractor to review section
01 3300 as well as this
document

- C. Samples to be incorporated into the Work will be returned to Contractor, together with a written notice designating the Sample with the appropriate review status and indicating errors discovered on review, if any. Other Samples will not be returned, but the same notice will be given with respect thereto, and that notice shall be considered a return of the Sample.
- D. Contractor shall revise and resubmit any Sample(s), Shop Drawing(s), Product Data, and other submittal(s) as required by the reviewer. Such resubmittals will be reviewed and returned in the same manner as original Sample(s), Shop Drawing(s), Product Data, and other submittal(s), within fourteen (14) days after receipt thereof or within fourteen (14) days after receipt of all related information necessary for such review. Such resubmittal shall not delay the Work.
- E. Contractor may proceed with any of the Work covered by Sample(s), Shop Drawing(s), Product Data, and other submittal(s) upon its return if designated as no exception taken, or revise as noted, provided the Contractor proceeds in accordance with the District and/or the Architect's notes and comments.
- F. Contractor shall not begin any of the work covered by a Sample(s), Shop Drawing(s), Product Data, and other submittal(s), designated as revise and resubmit or rejected, until a revision or correction thereof has been reviewed and returned to Contractor.
- G. Sample(s), Shop Drawing(s), Product Data, and other submittal(s) designated as revise and resubmit or rejected and requiring resubmittal, shall be revised or corrected and resubmitted to the District no later than fourteen (14) days or a shorter period as required to comply with the approved Construction Schedule, after its return to Contractor.
- H. Neither the review nor the lack of review of any Sample(s), Shop Drawing(s), Product Data, and other submittal(s) shall waive any of the requirements of the Contract Documents, or relieve Contractor of any obligation thereunder.
- I. District's and/or Architect's review of Shop Drawings does not relieve the Contractor of responsibility for any errors that may exist. Contractor is responsible for the dimensions and design of adequate connections and details and for satisfactory construction of all the Work.

PART 2 – PRODUCTS Not Used.

PART 3 - EXECUTION Not Used.

END OF DOCUMENT

Art Freiler Elementary School Shade Structures
Tracy Unified School District

SUBMITTAL NO.:

Architect's Project # 3595001

DATE: _____

DSA File/Appl. # XX-XX/XX-XXXXXX

Re-Submittal of Original No.: _____

1. SUBMITTAL TRANSMITTAL

Attention: Affifa Kadhim

Contractor: Company

Contact: Name _____

Sub Contractor:

Contact: _____

HMC
Architects

Please submit only one trade per submittal! Description of submitted materials:

Quantity submitted	Specification Section		Description of contents (e.g. product data, shop drawings, samples)
	Section #	Section Title	

Contractor Statement: (read and acknowledge)

This submittal has been reviewed and approved with respect to the means, methods, techniques, and procedures of construction, safety precautions, and program incidentals thereto. This submittal complies with the contract documents and comprises no variations thereto, unless accompanied by a substitution request.

By: _____
Name

Date: _____

2. RE-TRANSMITTAL TO CONTRACTOR:

Distribution: Contractor, Owner, Project Inspector, HMC, Other

- ☐ NO EXCEPTIONS TAKEN
☐ SUBMIT SPECIFIED ITEM

- ☐ REJECTED
☐ REVISE AND RESUBMIT

- ☐ FURNISH AS CORRECTED
☐ NO ACTION REQUIRED

Corrections or comments made on the shop drawings during this review do not relieve the Contractor from compliance with requirements of the Drawings and Specifications. This general check is only for the review of conformance with the design concept of the project and general compliance with the information given in the Contract Documents. The Contractor is responsible for confirming and correlating all quantities and dimensions, selecting fabrication processes and techniques of construction, coordinating his work with that of all the other trades, and performing his work in a safe and satisfactory manner.

HMC ARCHITECTS

By: _____

Date: _____

Additional Comments:

See Specification Section 01 3300 for use of this form

Art Freiler Elementary School Shade Structures
Tracy Unified School District

**SUBSTITUTION
REQUEST NO.:**

Architect's Project # 3595001
DSA File/Appl. # XX-XX/XX-XXXXXX

Date: _____

1. SUBSTITUTION REQUEST

Attention: Affifa Kadhim

HMC
Architects

Contractor: Company _____

Contact: Name _____

Please submit only one product per request!

Sub Contractor: _____

Include with a specified product Submittal

Contact: _____

2. PROPOSED SUBSTITUTIONS: The undersigned requests consideration of the following substitution:

Specified Item: _____ Page No.: _____ Paragraph No.: _____

Proposed Item: _____

3. REASON FOR REQUEST:

4. REQUIREMENTS FOR SUBSTITUTIONS:

Attached data includes product description, specifications, drawings, photographs, performance and test data adequate for evaluation of request; applicable portions of data are clearly identified. Attached data also includes a description of changes to Contract Documents, which proposed substitution will require for its proper installation.

The undersigned certifies that the following paragraphs, unless modified by attachments, are correct:

1. The proposed substitution does not affect dimensions shown on drawings and does not require design changes in the Contract Documents.
2. The undersigned will pay for changes to the building design, including engineering design, detailing and construction costs caused by the requested substitution.
3. The proposed substitution will have no adverse effect on the work, the schedule or specified warranty requirements.
4. Maintenance and service parts will be readily available for the proposed substitution.

The undersigned further states that the function, appearance and quality of the proposed substitution are equivalent or superior to the specified item.

Signature - Contractor/Subcontractor

Date

5. TRANSMITTAL TO CONTRACTOR:

Distribution: Contractor, Owner, Project Inspector, RGA, Other

☐ ACCEPTED

☐ ACCEPTED AS NOTED

☐ REJECTED

HMC ARCHITECTS

By: _____

Date: _____

Comments:

Art Freiler Elementary School Shade Structures
Tracy Unified School District

RFI NO.:

Architect's Project # 3595001
DSA File/Apl. # XX-XX/XX-XXXXXX

Date: _____

1. REQUEST FOR INFORMATION

Attention: Affifa Kadhim

From:

Contractor:

Company

Contact:

Name

Sub Contractor:

Contact:

HMC
Architects

Identify related specific references within the Contract Documents and supporting information:

Dwg./Document No.: _____

Building/Site Location: _____

2. Existing Condition (source / reason for the request):

3. Recommended Contractor Action(s) for resolution:

4. Project Inspector Acknowledgment:

Date Reviewed: _____

5. Owner / A/E Resolution(s):

Date of Response: _____ By: _____

Attachments: _____

Extra Work Involved in the Above Described Change?

Yes ☐

No ☐

Distribution: Contractor, Owner, Project Inspector, HMC, Other
See Specification Section 01300 for use of this form

HMC, Other

Art Freiler Elementary School Shade Structures
Tracy Unified School District

**E-DATA
REQUEST NO.:**

Architect's Project # 3595001
DSA File/Appl. # XX-XX/XX-XXXXXX

Date: _____

1. ELECTRONIC DATA REQUEST

Attention: Affifa Kadhim

From: Contractor: Company

Contact: Name

Sub Contractor:

Contact: _____

HMC
Architects

2. DATA REQUESTED - Provide list of specific drawings requested (include sheet numbers):

3. REASON FOR REQUEST - Provide clear explanation of why information is desired and for what purpose it will be utilized:

4. ACKNOWLEDGEMENT OF RESPONSIBILITY:

The electronic data files requested are distributed for reference only. Transferring such files can alter, delete or change original information. Accuracy of the data cannot be guaranteed as correct or complete and the Contractor accepts full responsibility for any and all inaccuracies, regardless of cause.

The hard copy documents, including addenda and subsequent written changes to the documents, represent the complete work of the contract and all electronic files should be cross-referenced and verified from that information as electronic files may not contain all contract information. It is the Contractor's responsibility to make any changes or revisions necessary.

This electronic data is furnished without guarantee of compatibility with your hardware or software. It is the Contractor's responsibility to notify the Architect in the event a compatibility problem or disk defect is encountered and a replacement disk is necessary.

This electronic data, in its present form, remains the property of HMC Architects and shall not be used for any other purpose than to provide background information for the project noted above. It is not to be released to any other party without the written consent of HMC Architects.

Accepted by: _____
Signature - Contractor/Subcontractor

Representing: _____
Contractor/Subcontractor Company Name

CERTIFICATION OF COMPLIANCE FOR BUILDING MATERIALS

This is to certify, in accordance with the Environmental Protection Agency requirements, that the materials and equipment used in the construction of the [project name] for the [district name] School District of [name of county] County, California, are asbestos free and are, therefore, not subject to monitoring for asbestos contamination.

Project Name: _____

Address: _____

Contractor: _____

Address: _____

Signature: _____

Title: _____

Date: _____

SEPARATE CERTIFICATE IS REQUIRED FOR EACH SITE

ROOFING CERTIFICATION

This is to certify that a representative of the manufacturer has visited the site prior to installation, inspected the surfaces which the roofing is applied and accepted those surfaces.

In addition, a representative of the manufacturer has inspected the materials and methods used, verified they are in accordance with the manufacturer's recommendations, and accepts the final installation.

A guarantee for materials and workmanship is to be provided separately.

Project name: _____

Address: _____

General Contractor: _____

Roofing Contractor: _____

Scope of Work/Roofing Type: _____

Roofing Manufacturer: _____

Manufacturer's Representative: _____

Representative's Signature: _____

Date: _____

A SEPARATE CERTIFICATE IS REQUIRED FOR EACH SITE
AND FOR EACH ROOFING TYPE

SITE STANDARDS

PART 1 – GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including without limitation, Site Access, Conditions, and Regulations;
- B. Special Conditions;
- C. Drug-Free Workplace Certification;
- D. Tobacco-Free Environment Certification;
- E. Criminal Background Investigation/Fingerprinting Certification;
- F. Temporary Facilities and Controls.

1.02 REQUIREMENTS OF THE DISTRICT:

- A. Drug-Free Schools and Safety Requirements:
 - (1) All school sites and other District Facilities have been declared "Drug-Free Zones." No drugs, alcohol and/or smoking are allowed at any time in any buildings and/or grounds on District property. No students, staff, visitors, or contractors are to use drugs on these sites.
 - (2) Smoking and the use of tobacco products by all persons is prohibited on or in District property. District property includes school buildings, school grounds, school-owned vehicles and vehicles owned by others while on District property. Contractor shall post: "Non-Smoking Area" in a highly visible location in each work area, staging area, and parking area. Contractor may designate a smoking area outside of District property within the public right-of-way, provided that this area remains quiet and unobtrusive to adjacent neighbors. This smoking area is to be kept clean at all times.
 - (3) Contractor shall ensure that no alcohol, firearms, weapons, or controlled substances enter or are used at the Site. Contractor shall immediately remove from the Site and terminate the employment of any employee(s) found in violation of this provision.
- B. Language: Profanity or other unacceptable and/or loud language will not be tolerated, "Cat calls" or other derogatory language toward students, staff, volunteers, parents or public will not be allowed.

C. Disturbing the Peace (Noise and Lighting):

- (1) Contractor shall observe the noise ordinance of the Site at all times including, without limitation, all applicable local, city, and/or state laws, ordinances, and/or regulations regarding noise and allowable noise levels.
- (2) The use of radios, etc., shall be controlled to keep all sound at a level that cannot be heard beyond the immediate area of use. District reserves the right to prohibit the use of radios at the Site, except for mobile phones or other handheld communication radios.
- (3) If portable lights are used after dark, all light must be located so as not to direct light into neighboring property.

D. Traffic:

- (1) Driving on the Premises shall be limited to periods when students and public are not present. If driving or deliveries must be made during the school hours, two (2) or more ground guides shall lead the vehicle across the area of travel. In no case shall driving take place across playgrounds or other pedestrian paths during recess, lunch, and/or class period changes. The speed limit on-the Premises shall be five (5) miles per hour (maximum) or less if conditions require.
- (2) All paths of travel for deliveries, including without limitation, material, equipment, and supply deliveries, shall be reviewed and approved by District in advance. Any damage will be repaired to the pre-damaged condition by the Contractor.
- (3) District shall designate a construction entry to the Site. If Contractor requests, District determines it is required, and to the extent possible, District shall designate a staging area so as not to interfere with the normal functioning of school facilities. Location of gates and fencing shall be approved in advance with District and at Contractor's expense.
- (4) Parking areas shall be reviewed and approved by District in advance. No parking is to occur under the drip line of trees or in softscape areas that could otherwise be damaged.

- E. All of the above shall be observed and complied with by the Contractor and all workers on the Site. Failure to follow these directives could result in individual(s) being suspended or removed from the work force at the discretion of the District. The same rules and regulations shall apply equally to delivery personnel, inspectors, consultants, and other visitors to the Site.

PART 2 - PRODUCTS Not Used.

PART 3 - EXECUTION Not Used.

END OF DOCUMENT

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Alteration requirements for modernizations, remodels, and additions.

1.2 RELATED REQUIREMENTS

- A. Section 01 1100, Summary of Work.
- B. Section 01 5000, Temporary Facilities and Controls.
- C. Section 01 7329, Cutting and Patching.

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CALGreen), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Coordination:
 - 1. Contractor to coordinate and conduct a meeting with the demolition contractor to verify which systems, if any, are to be protected and maintained. Such systems shall be clearly identified and marked to avoid unnecessary damage or removal.
 - 2. Coordinate work of alterations and renovations to expedite completion sequentially and to accommodate Owner occupancy.

1.5 QUALITY ASSURANCE

- A. Manufacturer and Installer Qualifications: As specified in the product specifications.
- B. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.
- C. Single Source Responsibility: Use materials and products of one manufacturer whenever possible.
- D. All materials, components, assemblies, workmanship and installation are to be observed by the Owner's Inspector of Record. Work not so inspected is subject to uncovering and replacement.

ALTERATION PROJECT PROCEDURES
SECTION 01 3516
3595001

1.6 FIELD CONDITIONS

- A. Make and be responsible for all field dimensions necessary for proper fitting and completion of work. Report discrepancies to Architect before proceeding.

PART 2 - PRODUCTS

2.1 PRODUCTS FOR PATCHING AND EXTENDING WORK

- A. New Materials: As specified in product Sections; match existing products and work for patching and extending work.
- B. Type and Quality of Existing Products: Determine by inspection and testing products where necessary, referring to existing work as a standard.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that demolition is complete and areas are ready for installation of new work.
- B. Inspect conditions of uncovered work affecting installation of products or performance work.
- C. Verify that specified items may be installed in accordance with the approved design.
- D. Beginning of restoration work means acceptance of existing conditions.
- E. In event of discrepancy, immediately notify Architect. Do not proceed in discrepant areas until discrepancies have been fully resolved.

3.2 PREPARATION

- A. Close openings in exterior surfaces to protect existing work and salvage items for weather and extremes of temperature and humidity. Insulate ductwork and piping to prevent condensation in exposed areas.
- B. Cut, move or remove items as necessary for access to alterations and renovation work.
- C. Remove debris and abandoned items from area and from concealed spaces.
- D. Remove unsuitable material not marked for salvage, such as rotted wood, corroded metals, and deteriorated masonry and concrete.
- E. Prepare surface, and remove surface finishes to provide for proper installation of new work and finishes including blocking, framing, insulation, etc.
- F. Replace materials as specified for finished work.

3.3 INSTALLATION

- A. Complete Project in all respects.
- B. Remove, cut and patch work in a manner to minimize damage and to provide a means of restoring products and finishes to original condition, and installation of concealed work, as specified in Section 01 7329, Cutting and Patching,
- C. Install products as specified in individual specifications Sections.
- D. Where materials or equipment are removed, but no new finish is scheduled, patch and repair any damage to match existing wall surface.

3.4 TRANSITIONS

- A. Where new work abuts or aligns with existing, perform a smooth and even transition. Patched work is to match existing adjacent work in texture and appearance.
- B. When finished surfaces are cut so that a smooth transition with new work is not possible, terminate existing surface along a straight line at a natural point of division and make recommendation to Architect.

3.5 ADJUSTMENTS

- A. Where removal of partitions or walls results in adjacent spaces becoming one, rework floors, walls and ceilings to a smooth plane without breaks, steps or bulkheads.
- B. Where a change of plane of 1/8" or more occurs, submit recommendation for providing a smooth transition for Architect review.
- C. Fit work at penetrations of surfaces as specified in Section 01 7329.

3.6 FINISHES

- A. Finish surfaces as specified in individual Product Sections.
- B. Finish patches to produce uniform finish and texture over entire area. When finish cannot be matched, refinish entire surface to nearest intersections.

3.7 REPAIR OF DAMAGED SURFACES

- A. Patch or replace portions of existing surfaces which are damaged, lifted, discolored, or showing other imperfections.
- B. Repair substrate prior to patching finish.
- C. In the event of damage, make all repairs and replacements necessary to the approval of the Architect at no additional cost to the Owner.

ALTERATION PROJECT PROCEDURES
SECTION 01 3516
3595001

3.8 CLEANING

- A. Upon completion of installation, remove manufacturer's temporary labels and marks of identification. Thoroughly clean surfaces and remove foreign material. Leave entire work in neat, orderly, clean and acceptable condition.

3.9 PROTECTION

- A. Protect work and materials of this Section prior to and during installation, and protect the installed work and materials of other trades.
- B. Exposed finishes shall be free from scratches, dents, permanent discolorations and other defects in workmanship or material.

END OF SECTION

p:\sacramento\3595 tracy unified school district\001-000_villalovoz es new shade structures\08 specifications\06 spec\04 final\freiler - shade struct\01 3516 _alteration project procedures.docx
Last Updated: December 16, 2021

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Special environmental, sustainable, and “green” building practices related to indoor air quality, resource efficiency supplementing the Pollutant Control requirements specified under Section 01 8113.10, Sustainable Design Requirements, and to ensure healthy indoor air quality in final Project.
- B. Contractor is required to comply with sustainable building practices during construction and when considering materials for substitutions. Refer to Article “Design Requirements.”

1.2 RELATED REQUIREMENTS

- A. Section 01 6116, Volatile Organic Compound (VOC) Restrictions.
- B. Section 01 7419, Construction Waste Management and Disposal.
- C. Section 01 8113, Sustainable Design Requirements.

1.3 ADMINISTRATIVE REQUIREMENTS

- A. Submittal Procedures:
 - 1. Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
 - 2. Sustainable Design Submittals shall comply with the additional requirement of Section 01 8113, Sustainable Design Requirements.
 - 3. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.

1.4 DESIGN REQUIREMENTS

- A. Owner has established general environmental goals for design and for construction of the Project.
 - 1. In addition to the Contractor, the Contractor’s construction team, including subcontractors, suppliers, and manufacturers, are encouraged to participate where possible to realize the Owner’s environmental goals.
 - 2. Intent is for environmental goals to be achieved in a manner which ultimately provides a safe and healthy environment for building occupants with minimal impact on the local, regional and global environment.
- B. Environmental Goals:
 - 1. Refer to specific Specifications Sections for more detailed construction requirements related to specific materials and systems.

ENVIRONMENTAL PROCEDURES
SECTION 01 3543
3595001

1.5 INFORMATIONAL SUBMITTALS

A. Indoor Air Quality (IAQ) Data:

1. Environmental Issues: Submit emission test data produced by acceptable testing laboratory, listed in this Specification Article "Quality Assurance," for materials as required in each specific Specification Section.
 - a. Laboratory reports shall contain emissions test data on Volatile Organic Compounds (VOCs) including Total Volatile Organic Compounds (TVOC), specific individual VOCs, formaldehyde and other aldehydes as described in this Section.
 - b. Identify VOCs emitted by each material as required in these Specifications, and demonstrate compliance with the California Green Building Standards Code, edition current as of the date of this Contract.
 - c. Specific test conditions and requirements are set forth in the Specifications. For required tests, submit documentation of sample acquisition, handling, and test specimen preparation, as well as test conditions, methods, and procedures. The tests consist of a 10-day conditioning period followed by a 96-hour test period.
 - 1) Samples collected during the test period at 24, 48, and 96-hours shall be analyzed for TVOC and formaldehyde.
 - 2) VOC samples collected at 96 hours shall be identified and quantified for compounds that are found on the list of Chemicals of Concern. The Chemicals of Concern list is based on the California OEHHA list as of September 2002 (The most recent list shall be used for this Specification as published at:
 - a) http://www.oehha.org/air/chronic_rels/allChrels.html.
2. Cleaning and Maintenance Products: Provide data on manufacturers' recommended maintenance, cleaning, refinishing and disposal procedures for materials and products. These procedures are for final Contractor cleaning of the project prior to Substantial Completion and for provided materials and products as required by the specific Specification Sections.
 - a. Where chemical products are recommended for these procedures, provide documentation to indicate that no component present in the cleaning product at more than 1 percent of the total mass of the cleaning product is a carcinogen or reproductive toxicant as identified in the Chemicals of Concern list referenced above.
 - b. Avoid cleaning products containing alpha-pinene, d-limonene or other unsaturated carbon double bond alkenes due to chemical reactions with ozone to form aldehydes, acidic aerosols, and ultra-fine particulate matter in indoor air.

B. Certificates:

1. Prior to Final Completion, submit a certificate signed by corporate office holder of Contractor, subcontractor, supplier, vendor, installer or manufacturer primarily responsible for the manufacturing of the product, indicating materials provided are

essentially the same, and contain essentially the same components as products and materials tested.

2. Comply with requirements specified in Specification Section 01 7700, Closeout Procedures.

1.6 CLOSEOUT SUBMITTALS

- A. Submit data relating to Environmental Issues.
 1. Submit environmental product certifications, in two forms:
 - a. Two CD-ROMs organized by CSI Division Format.
 - b. Three three-ring binders organized by CSI Division Format with Table of Contents and with dividers for each Division.

1.7 QUALITY ASSURANCE

- A. Environmental Project Management and Coordination: Contractor to identify one person on Contractor's staff to be responsible for environmental issues compliance and coordination.
 1. Experience: Environmental project manager shall have experience relating to sustainable building construction.
 2. Responsibilities: Carefully review the Contract Documents for environmental issues, coordinate work of trades, subcontractors, and suppliers; instruct workers relating to environmental issues; and oversee Project Environmental Goals.
 3. Meetings: Discuss Environmental Goals at following meetings.
 - a. Pre-construction meeting.
 - b. Pre-installation meetings.
 - c. Regularly scheduled job-site meetings.
 - d. Special sustainability issues meetings.
- B. Environmental Issues Criteria: Comply with requirements listed in the Specification Sections.
- C. Acceptable Indoor Air Emissions Testing Laboratories:
 1. Selection of testing laboratories shall include assessment of prior experience in conducting indoor source emissions tests.
 2. The proposed laboratory shall be an independent company or organization not related to the manufacturer of the products to be tested.
 3. Submit documentation on proposed laboratory for review and approval by Owner.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Packaging: Deliver materials in recyclable or in reusable packaging such as cardboard, wood, paper, or reusable blankets, which will be reclaimed by supplier or manufacturer for recycling.

ENVIRONMENTAL PROCEDURES

SECTION 01 3543

3595001

1. Minimize packaging materials to maximum extent possible while still ensuring protection of materials during delivery, storage, and handling.
 2. Unacceptable Packaging Materials: Polyurethane, polyisocyanate, polystyrene, polyethylene, and similar plastic materials such as “foam” plastics and “shrink-fit” plastics.
 3. Reusable Blankets: Deliver and store materials in reusable blankets and mats reclaimed by the manufacturers or suppliers for reuse where the reclamation program exists or where a program can be developed for such reuse.
 4. Pallets: Where pallets are used, suppliers shall be responsible to ensure pallets are removed from site for reuse or for recycling.
 5. Corrugated Cardboard and Paper: Where paper products are used, recycle as part of the construction waste management recycling program, or return to the material’s manufacturer for use by the manufacturer or supplier.
 6. Sealants, Paint, Primers, Adhesives, and Coating Containers: Return to the supplier or manufacturer for reuse where such program is available.
- B. Comply with the additional requirements specified in Section 01 7419, Construction Waste Management and Disposal.

1.9 FIELD CONDITIONS

- A. No smoking will be permitted in indoor Project site locations, in accordance with California Labor Code (Section 400-6413.5).
- B. Environmental Product Certification:
1. Include certification that indicates cleaning materials comply with requirements of these Specifications.
- C. Construction Ventilation and Preconditioning:
1. Temporary Construction Ventilation: Maintain sufficient temporary ventilation of areas where materials are being used that emit VOCs. Maintain ventilation continuously during installation, and until emissions dissipate following installation. If continuous ventilation is not possible utilizing the building’s HVAC system(s) then ventilation shall be supplied using open windows and temporary fans, sufficient to provide no less than three air changes per hour.
 - a. Period after installation shall be sufficient to dissipate odors and elevated concentrations of VOCs. Where no specific period is stated in these Specifications, a time period of 72 hours shall be used.
 - b. Ventilate areas directly to outside; ventilation to other enclosed areas is not acceptable.
 2. During dust producing activities, including drywall installation and finishing, turn ventilation system off, and openings in supply and return HVAC system shall be protected from dust infiltration. Provide temporary ventilation as required.
 3. Preconditioning: Prior to installation, allow products which have odors and significant VOC emissions to off-gas in dry, well-ventilated space for 14 calendar days to allow for reasonable dissipation of odors and emissions prior to delivery to Project site and installation.

- a. Condition products without containers and packaging to maximize off-gassing of VOCs
 - b. Condition products in ventilated warehouse or other building. Comply with substitution requirements for consideration of other locations.
- D. Protection:
 - 1. Moisture Stains: Materials with evidence of moisture damage, including stains, are not acceptable, including both stored and installed materials; immediately remove from site and properly dispose.
 - a. Take special care to prevent an accumulation of moisture on installed materials and within packaging during delivery, storage, and handling to prevent development of molds and mildew on packaging and on products
 - b. Immediately remove from site and properly dispose of materials showing signs of mold and signs of mildew, including materials with moisture stains.
 - c. Replace moldy materials with new, undamaged materials.
 - 2. Ducts: Seal ducts during transportation, delivery, and construction to prevent accumulation of construction dust and construction debris inside of ducts.

PART 2 - PRODUCTS

2.1 SUBSTITUTIONS

- A. Requests for substitutions shall comply with requirements specified in Specification Section 01 3300, Submittals, and with the following additional information required where environmental issues are specified:
 - 1. Indicate how each proposed substitution complies with requirements for VOCs.
 - 2. Owner, in consultation with Architect reserve the right to reject proposed substitutions where data for VOCs is not provided or where emissions of individual VOCs are higher than for the specified materials.
 - 3. Comply with the specified recycled content and other environmental requirements.

PART 3 - EXECUTION

3.1 FIELD QUALITY CONTROL

- A. Sequencing:
 - 1. On-Site Application: Where odorous and/or high VOC emitting products are applied on-site, apply prior to installation of porous and fibrous materials. Where this is not possible, protect porous materials with polyethylene vapor retarders.
 - 2. Complete interior finish material installation no less than 14 days prior to Substantial Completion to allow for Building Flush Out as described in Paragraph 3.1B.

ENVIRONMENTAL PROCEDURES

SECTION 01 3543

3595001

- B. Building Flush Out: Just prior to Substantial Completion, flush out building air continuously using maximum tempered outside air, or maximum amount of outside air while achieving reasonable indoor temperature, for at least 14 calendar days. Continuously is defined as 24 hours per day, 7 days a week. If interruptions of more than a few hours are required for testing and balancing purposes, extend flush out period accordingly in order to achieve the minimum 14 calendar day building flush out period.
 - 1. When Contractor is required to perform touch-up work, provide temporary construction ventilation during installation and extend building flush-out by a minimum of 4 calendar days after touch-up installation is complete with maximum tempered outside air for 24 hours per day.
 - 2. If construction schedule permits, extend flush-out period beyond minimum building flush out period for an additional 15 days.
 - 3. Return ventilation system to normal operation following flush-out period to minimize energy consumption.

3.2 CLEANING

- A. Clean interior and exterior surfaces exposed to view; remove temporary labels, stains, and foreign substances; polish transparent and glossy surfaces using cleaning and maintenance products that conform to standards as described in Part 1 of this Section.
- B. Clean equipment and fixtures to sanitary condition using cleaning and maintenance products that conform to standards as described in Part 1 of this Section.
- C. Products used for cleaning shall comply with Proposition 65 and the additional restrictions for volatile organic compounds specified in Section 01 6116.
- D. Vacuum carpeted and soft surfaces with high efficiency particulate arrestor (HEPA) vacuum.
- E. If ducts were not sealed during construction, and contain dust or dirt, clean ducts using HEPA vacuum immediately prior to Substantial Completion and prior to using ducts to circulate air. Oil film on sheet metal shall be removed before shipment to site. Ducts shall be inspected to confirm that no oil film is present. Remove oil film.
- F. Replace air filters, both pre and final filters, just prior to Substantial Completion.
- G. Remove and properly dispose of recyclable materials using construction waste management program described in Section 01 7419, Construction Waste Management and Disposal.

3.3 PROTECTION

- A. Protect interior materials from water intrusion or penetration where interior products are not intended for wet applications and are exposed to moisture.
- B. Protect installed products using methods that do not support growth of mold and mildew.

ENVIRONMENTAL PROCEDURES
SECTION 01 3543
3595001

1. Immediately remove from site materials with mold or mildew.

END OF SECTION

*p:\sacramento\3595 tracy unified school district\001-000_villalovoz es new shade structures\08 specifications\06 spec\04 final\freiler
- shade struct\01 3543_environmental procedures.docx*

REGULATORY REQUIREMENTS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Obtaining of Permits, Licenses and Registrations and Work to Comply with All Applicable Laws and Regulations;
- B. Special Conditions; and
- C. Quality Control.

1.02 DESCRIPTION:

This section covers the general requirements for regulatory requirements pertaining to the Work and is supplementary to all other regulatory requirements mentioned or referenced elsewhere in the Contract Documents.

1.03 REQUIREMENTS OF REGULATORY AGENCIES:

- A. All statutes, ordinances, laws, rules, codes, regulations, standards, and the lawful orders of all public authorities having jurisdiction over the Work, are hereby incorporated into these Contract Documents as if repeated in full herein and are intended to be included in any reference to Code or Building Code, unless otherwise specified, including, without limitation, the references in the list below. Contractor shall make available at the Site copies of all the listed documents applicable to the Work as the District and/or Architect may request, including, without limitation, applicable portions of the California Code of Regulations ("CCR").
 - (1) California Building Standards Administrative Code, Part 1, Title 24, CCR.
 - (2) California Building Code (CBC), Part 2, Title 24, CCR; (International Building Code volumes 1-2 and California Amendments).
 - (3) California Electrical Code (CEC), Part 3, Title 24, CCR; (National Electrical Code and California Amendments).
 - (4) California Mechanical Code (CMC), Part 4, Title 24, CCR; (Uniform Mechanical Code and California Amendments).
 - (5) California Plumbing Code (CPC), Part 5, Title 24, CCR; (Uniform Plumbing Code and California Amendments).

- (6) California Fire Code (CFC), Part 9, Title 24, CCR; (International Fire Code and California Amendments).
- (7) California Green Building Standards Code (CALGreen), Part 11, Title 24, CCR.
- (8) California Referenced Standards Code, Part 12, Title 24, CCR.
- (9) State Fire Marshal Regulations, Public Safety, Title 19, CCR.
- (10) Partial List of Applicable National Fire Protection Association (NFPA) Standards:
 - (a) NFPA 13 - Automatic Sprinkler System.
 - (b) NFPA 14 - Standpipes Systems.
 - (c) NFPA 17A - Wet Chemical System
 - (d) NFPA 24 - Private Fire Mains.
 - (e) (California Amended) NFPA 72 - National Fire Alarm Codes.
 - (f) NFPA 253 - Critical Radiant Flux of Floor Covering System.
 - (g) NFPA 2001 - Clean Agent Fire Extinguishing Systems.
- (11) California Division of the State Architect interpretation of Regulations ("DSA IR"), including, without limitation:
 - (a) DSA IR A-6 — Construction Change Document Submittal and Approval Processes.
 - (b) DSA IR A-7 — Project Inspector Certification and Approval.
 - (c) DSA IR A-8 — Project Inspector and Assistant Inspector Duties and Performance.
 - (d) DSA IR A-12 — Assistant Inspector Approval.
- (12) DSA Procedures ("DSA PR")
 - (a) DSA PR 13-01 – Construction Oversight Process
 - (b) DSA PR 13-02 – Project Certification Process

B. This Project shall be governed by applicable regulations, including, without limitation, the State of California's Administrative Regulations for the Division of the State Architect-Structural Safety (DSA/SS), Chapter 4, Part 1, Title 24, CCR, and the most current version on the date the bids are opened and as it pertains to school construction including, without limitation:

- (1) Test and testing laboratory per Section 4-335. District shall pay for the testing laboratory.
- (2) Special inspections per Section 4-333(c).
- (3) Deferred Approvals per section 4-317(g).
- (4) Verified reports per Sections 4-336 & 4-343(c).
- (5) Duties of the Architect & Engineers shall be per Sections 4-333(a) and 4-341.
- (6) Duties of the Contractor shall be per Section 4-343.
- (7) Duties of Project Inspector shall be per Section 4-334.
- (8) Addenda and Construction Change Documents per Section 4-338.

Contractor shall keep and make available all applicable parts of the most current version of Title 24 referred to in the plans and specifications at the Site during construction.

C. Items of deferred approval shall be clearly marked on the first sheet of the Architect's and/or Engineer's approved Drawings. All items later submitted for approval shall be per Title 24 requirements to the DSA.

- (1) Contractor shall submit the following to Architect for review and endorsement:
 - (a) Product information on proposed material/system supplier.
 - (b) Drawings, specifications, and calculations prepared, signed, and stamped by an architect or engineer licensed in the State of California for that portion of the Work.
 - (c) All other requirements as may be required by DSA.
- (2) Cost of preparing and submitting documentation per DSA Deferred Approval requirements including required modifications to Drawings and Specifications, whether or not indicated in the Contract Documents, shall be borne by Contractor.
- (3) Contractor shall not begin fabrication and installation of deferred approval items without first obtaining DSA approval of Drawings and Specifications.
- (4) Schedule of Work Subject to DSA Deferred Approval: Window wall systems exceeding 10 feet in span.

PART 2 – PRODUCTS Not Used.

PART 3 – EXECUTION Not Used.

END OF DOCUMENT

ABBREVIATIONS AND ACRONYMS

PART 1 – GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions including without limitation, Definitions;
- B. Special Conditions.

1.02 DOCUMENT INCLUDES:

- A. Abbreviations used throughout the Contract Documents.
- B. Reference to a technical society, organization, or body is by abbreviation, as follows:

1.	AA	The Aluminum Association
2.	AASHTO	American Association of State Highway and Transportation Officials
3.	ABPA	Acoustical and Board Products Association
4.	ACI	American Concrete Institute
5.	AGA	American Gas Association
6.	AGC	Associated General Contractors of America
7.	AHC	Architectural Hardware Consultant
8.	AHRI	Air Conditioning, Heating, Refrigeration Institute
9.	AI	Asphalt Institute
10.	AIA	American Institute of Architects
11.	AISC	American Institute of Steel Construction
12.	AISI	American Iron and Steel Institute
13.	AMCA	Air Movement and Control Association
14.	ANSI	American National Standards Institute
15.	APA	APA – The Engineered Wood Association
16.	ASCE	American Society of Civil Engineers
17.	ASHRAE	American Society of Heating, Refrigeration and Air Conditioning Engineers
18.	ASME	American Society of Mechanical Engineers
19.	ASTM	American Society of Testing and Materials International
20.	AWPA	American Wood Protection Association
21.	AWPI	American Wood Preservers Institute
22.	AWS	American Welding Society
23.	AWSC	American Welding Society Code
24.	AWI	Architectural Woodwork Institute
25.	AWWA	American Water Works Association
26.	BIA	The Brick Industry Association

27.	CCR	California Code of Regulations
28.	CLFMI	Chain Link Fence Manufacturers Institute
29.	CRA	California Redwood Association
30.	CRSI	Concrete Reinforcing Steel Institute
31.	CS	Commercial Standards
32.	CSI	Construction Specifications Institute
33.	CTI	Cooling Technology Institute
34.	FGIA	Fenestration and Glazing Industry Alliance
35.	FGMA	Flat Glass Manufacturers' Association
36.	FIA	Factory Insurance Association
37.	FM	Factory Mutual Global
38.	FS/FED SPEC	Federal Specification
39.	FTI	Facing Title Institute
40.	GA	Gypsum Association
41.	IAPMO	International Association of Plumbing and Mechanical Officials
42.	ICC	International Code Council
43.	IEEE	Institute of Electrical and Electronics Engineers
44.	IES	Illuminating Engineering Society
45.	MCAC	Mason Contractors Association of California
46.	MIMA	Mineral Wool Insulation Manufacturers Association
47.	MLMA	Metal Lath Manufacturers Association
48.	MS/MIL SPEC	Military Specifications
49.	NAAMM	National Association of Architectural Metal Manufacturers
50.	NBHA	National Builders Hardware Association
51.	NCMA	National Concrete Masonry Association
52.	NCSEA	National Council of Structural Engineers Associations
53.	NEC	National Electrical Code
54.	NEMA	National Electrical Manufacturers Association
55.	NIST	National Institute of Standards and Technology
56.	NSI	Natural Stone Institute
57.	NTMA	National Terrazzo and Mosaic Association, Inc.
58.	ORS	Office of Regulatory Services (California)
59.	OSHA	Occupational Safety and Health Act
60.	PCI	Precast/Prestressed Concrete Institute
61.	PCA	Portland Cement Association
62.	PCA	Painting Contractors Association
63.	PDI	Plumbing Drainage Institute
64.	PEI	Porcelain Enamel Institute, Inc.
65.	PG&E	Pacific Gas & Electric Company
66.	PS	Product Standards
67.	SDI	Steel Door Institute; Steel Deck Institute
68.	SJI	Steel Joist Institute
69.	SSPC	Society for Protective Coatings
70.	TCNA	Tile Council of North America, Inc.
71.	TPI	Truss Plate Institute
72.	UBC	Uniform Building Code
73.	UL	Underwriters Laboratories Code

74.	UMC	Uniform Mechanical Code
75.	USDA	United States Department of Agriculture
76.	VI	Vermiculite Institute
77.	WCLIB	West Coast Lumber Inspection Bureau
78.	WDMA	Window and Door Manufacturers Association
79.	WEUSER	Western Electric Utilities Service Engineering Requirements
80.	WIC	Woodwork Institute of California

PART 2 - PRODUCTS Not Used.

PART 3 - EXECUTION Not Used.

END OF DOCUMENT

DEFINITIONS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions including without limitation, Definitions;
- B. Special Conditions.

1.02 QUALITY ASSURANCE

- A. For products or workmanship specified by association, trade, or Federal Standards, Contractor shall comply with requirements of the standard, except when more rigid requirements are specified in the Contract Documents, or are required by applicable codes.
- B. Contractor shall conform to current reference standard publication date in effect on the date of bid opening.
- C. Contractor shall obtain copies of standards unless specifically required not to by the Contract Documents.
- D. Contractor shall maintain a copy of all standards at jobsite during submittals, planning, and progress of the specific Work, until final completion, unless specifically required not to by the Contract Documents.
- E. Should specified reference standards conflict with Contract Documents, Contractor shall request clarification from the District and/or the Architect before proceeding.
- F. The contractual relationship of the parties to the Contract shall not be altered from the contractual relationship as indicated in the Contract Documents by mention or inference otherwise in any referenced document.
- G. Governing Codes shall be as shown in the Contract Documents including, without limitation, the Specifications.

END OF DOCUMENT

REFERENCES**PART 1 - GENERAL****1.01 SCHEDULE OF REFERENCES:**

The following information is intended only for the general assistance of the Contractor, and the District does not represent that all of the information is current. It is the Contractor's responsibility to verify the correct information for each of the entities listed.

AA	The Aluminum Association 1400 Crystal Drive, Suite 430 Arlington, VA 22202 www.aluminum.org	703/358-2960
AABC	Associated Air Balance Council 2401 Pennsylvania Avenue NW, Suite 330 Washington, DC 20037 www.aabc.com	202/737-0202
AASHTO	American Association of State Highway and Transportation Officials 555 12th St. NW - Suite 1000 Washington, DC 20004 www.transportation.org	202/624-5800
AATCC	American Association of Textile Chemists and Colorists P.O. Box 12215 Research Triangle Park, NC 27709-2215 www.aatcc.org	919/549-8141
ACA	American Coatings Association 901 New York Ave., NW, Suite 300 West Washington, DC 20001 www.paint.org	202/462-6272
ACI	American Concrete Institute 38800 Country Club Dr. Farmington Hills, MI 48331-3439 www.concrete.org	248/848-3800
ACPA	American Concrete Pipe Association 5605 N. MacArthur Blvd., Suite 340 Irving, TX 75038 www.concrete-pipe.org	972/506-7216

ADC	Air Duct Council 1901 N. Roselle Road, Suite 800 Schaumburg, IL 60195 www.flexibleduct.org	847/706-6750
AF&PA	American Forest and Paper Association 1101 K Street, NW, Suite 700 Washington, DC 20005 www.afandpa.org	202/463-2700
AGA	American Gas Association 400 North Capitol Street, NW, Suite 450 Washington, DC 20001 www.aga.org	202/824-7000
AGC	Associate General Contractors of America 2300 Wilson Blvd., Suite 300 Arlington, VA 22201 www.agc.org	703/548-3118
AHA	American Hardboard Association 1210 West Northwest Highway Palatine, IL 60067 http://domensino.com/AHA/default.htm	847/934-8800
AI	Asphalt Institute 2696 Research Park Drive Lexington, KY 40511-8480 www.asphaltinstitute.org	859/288-4960
AIA	The American Institute of Architects 1735 New York Ave., NW Washington, DC 20006-5292 www.aia.org	202/626-7300
AISC	American Institute of Steel Construction 130 East Randolph Street, Suite 2000 Chicago, IL 60601 www.aisc.org	312.670.2400
AISI	American Iron and Steel Institute 25 Massachusetts Ave., NW, Suite 800 Washington, DC 20001 www.steel.org	202/452-7100
AITC	American Institute of Timber Construction 1010 South 336th Street, #210 Federal Way, WA 98003-7394 https://www.plib.org/aitc/	253/835-3344

ALI	Associated Laboratories, Inc. P.O. Box 152837 Dallas, TX 75315 www.assoc-labs.com	214/565-0593
ALSC	American Lumber Standards Committee, Inc. 7470 New Technology Way, Suite F Frederick, MD 21703 www.alsc.org	301/972-1700
AMCA	Air Movement and Control Association International, Inc. 30 W. University Drive Arlington Heights, IL 60004 www.amca.org	847/394-0150
AMPP (formerly SSPC)	Association for Materials Protection and Performance (merger of Society for Protective Coatings and National Association of Corrosion Engineers International) (formerly Steel Structures Painting Council) 800 Trumbull Drive Pittsburgh, PA 15205 www.sspc.org	412/281-2331 877/281-7772
ANLA	AmericanHort (merger of American Nursery & Landscape Association and OFA – The Association of Horticultural Professionals) 2130 Stella Court Columbus, OH 43215 www.americanhort.org	614/487-1117
ANSI	American National Standards Institute 1899 L Street, NW, 11th Floor Washington, DC 20036 www.ansi.org	202/293-8020
APA	APA-The Engineered Wood Association 7011 S. 19th Street Tacoma, WA 98466-5333 www.apawood.org	253/565-6600

APA	Architectural Precast Association 325 John Knox Rd, Suite L-103 Tallahassee, FL 32303 www.archprecast.org	850/205-5637
APCIA	American Property Casualty Insurance Association (merger of American Insurance Association (formerly the National Board of Fire Underwriters) with the Property Casualty Insurers Association of America) 555 12th St, NW, Suite 550 Washington DC 20004 www.apci.org	202/828-7100
AHRI	Air Conditioning and Refrigeration Institute (now Air-Conditioning, Heating, & Refrigeration Institute) 2311 Wilson Blvd, Suite 400 Arlington, VA 22201 www.ahrinet.org	703/524-8800
ARMA	Asphalt Roofing Manufacturers Association 2331 Rock Spring Road Forest Hill, MD 21050 www.asphaltroofing.org	443/640-1075
ASA	The Acoustical Society of America Suite 300 1305 Walt Whitman Road Melville, NY 11747-4300 https://acousticalsociety.org/	516/576-2360
ASCE	American Society of Civil Engineers 1801 Alexander Bell Drive Reston, VA 20191 www.asce.org	800/548-2723 703/295-6300
ASHRAE	American Society of Heating, Refrigerating and Air Conditioning Engineers 180 Technology Parkway Peachtree Corners, GA 30092 www.ashrae.org	800/527-4723 404/636-8400
ASLA	American Society of Landscape Architects 636 Eye Street, NW Washington, DC 20001-3736 www.asla.org	202/898-2444
ASME	American Society of Mechanical Engineers Two Park Avenue New York, NY 10016-5990 www.asme.org	800/834-2763

ASPE	American Society of Plumbing Engineers 6400 Shafer Court, Suite 350 Rosemont, IL 60018 http://aspe.org	847/296-0002
ASQ	American Society for Quality P.O. Box 3005 Milwaukee, WI 53201-3005 or 600 North Plankinton Avenue Milwaukee, WI 53203 http://asq.org	800/248-1946 414/272-8575
ASSE	American Society of Sanitary Engineering 18927 Hickory Creek Dr., Suite 220 Mokena, IL 60448 www.asse-plumbing.org	708/995-3019
ASTM	ASTM International 100 Barr Harbor Drive PO Box C700 West Conshohocken, PA, 19428-2959 www.astm.org	610/832-9500
AWCI	Association of the Wall and Ceiling Industry 513 West Broad Street, Suite 210 Falls Church, VA 22046 www.awci.org	703/538-1600
AWPA	American Wood Protection Association (formerly American Wood Preservers Institute) P.O. Box 361784 Birmingham, AL 35236-1784 www.awpa.com	205/733-4077
AWS	American Welding Society 8669 NW 36 Street, Suite 130 Miami, FL 33166 www.aws.org	800/443-9353 305/443-9353
AWI	Architectural Woodwork Institute 46179 Westlake Drive, Suite 120 Potomac Falls, VA 20165-5874 www.awinet.org	571/323-3636
AWWA	American Water Works Association 6666 West Quincy Avenue Denver, CO 80235 www.awwa.org	800/926-7337 303/794-7711

BHMA	Builders Hardware Manufacturers Association 355 Lexington Avenue, 15th Floor New York, NY 10017 www.buildershardware.com	212/297-2122
BIA	The Brick Industry Association 12007 Sunrise Valley Drive, Suite 430 Reston, VA 20191 www.gobrick.com	703/620-0010
CGA	Compressed Gas Association 8484 Westpark Drive, Suite 220 McLean, VA 22102 www.cganet.com	703/788-2700
CISCA	Ceilings & Interior Systems Construction Association 1010 Jorie Blvd, Suite 30 Oak Brook, IL 60523 www.cisca.org	630/584-1919
CISPI	Cast Iron Soil Pipe Institute 2401 Fieldcrest Dr. Mundelein, IL 60060 www.cispi.org	224/864-2910
CLFMI	Chain Link Fence Manufacturers Institute 10015 Old Columbia Road, Suite B-215 Columbia, MD 21046 chainlinkinfo.org	301/596-2583
CPA	Composite Panel Association 19465 Deerfield Avenue, Suite 306 Leesburg, VA 20176 www.compositepanel.org	703/724-1128
CPSC	Consumer Product Safety Commission 4330 East-West Highway Bethesda, MD 20814 www.cpsc.gov	800/638-2772
CRA	California Redwood Association 818 Grayson Road, Suite 201 Pleasant Hill, CA 94523 www.calredwood.org	925/935-1499

CRI	Carpet and Rug Institute 100 S. Hamilton Street Dalton, GA 30722-2048 www.carpet-rug.org	706/278-3176
CRSI	Concrete Reinforcing Steel Institute 933 N. Plum Grove Road Schaumburg, IL 60173-4758 www.crsi.org	847/517-1200
CSI	The Construction Specifications Institute 123 North Pitt St, Suite 450 Alexandria, VA 22314 www.csinet.org	800/689-2900
CTIOA	Ceramic Tile Institute of America 12061 Jefferson Blvd. Culver City, CA 90230-6219 www.ctioa.org	310/574-7800
DHA	Decorative Hardwoods Association (formerly Hardwood Plywood & Veneer Association) 42777 Trade West Dr. Sterling, VA 20166 https://www.decorativehardwoods.org/	703/435-2900
DHI	Door and Hardware Institute (formerly National Builders Hardware Association) 2001 K Street NW, 3rd Floor North Washington, DC 20006 www.dhi.org	202/367-1134
DIPRA	Ductile Iron Pipe Research Association P.O. Box 190306 Birmingham, AL 35219 www.dipra.org	205/402-8700
DOC	U.S. Department of Commerce 1401 Constitution Ave., NW Washington, DC 20230 www.commerce.gov	202/482-2000
DOT	U.S. Department of Transportation 1200 New Jersey Avenue, SE Washington, DC 20590 www.dot.gov	855/368-4200
EJMA	Expansion Joint Manufacturers Association, Inc. 25 North Broadway Tarrytown, NY 10591 www.ejma.org	914/332-0040

EPA	Environmental Protection Agency Ariel Rios Building 1200 Pennsylvania Avenue, N.W. Washington, DC 20460 www.epa.gov	202/272-0167
FCICA	Floor Covering Installation Contractors Association 800 Roosevelt Rd., Bldg. C, Suite 312 Glen Ellyn, IL 60137 www.fcica.com	630/672-3702
FGIA	Fenestration and Glazing Industry Alliance 1900 E Golf Rd, Suite 1250 Schaumburg, IL 60173 https://fgiaonline.org/	847/303-5664
FM Global	Factory Mutual Insurance Company Amy Daley Global Practice Leader – Education, Public Entities, Health Care FM Global 270 Central Avenue Johnston, RI 02919-4949 www.fmglobal.com	401/275-3000 401/275-3029
FS	General Services Administration (GSA) Index of Federal Specifications, Standards and Commercial Item Descriptions 470 East L'Enfant Plaza, SW, Suite 8100 Washington, DC 20407 www.gsa.gov	202/619-8925
GA	The Gypsum Association 962 Wayne Ave., Suite 620 Silver Spring, MD 20910 www.gypsum.org	301/277-8686
HMA	Hardwood Manufacturers Association One Williamsburg Place, Suite 108 Warrendale, PA 15086 http://hmamembers.org	412/244-0440

IAPMO	International Association of Plumbing and Mechanical Officials (formerly the Western Plumbing Officials Association) 4755 E. Philadelphia St. Ontario, CA 91761 www.iapmo.org	909/472-4100
ICC	International Code Council 500 New Jersey Avenue, NW, 6th Floor Washington, DC 20001 www.iccsafe.org	888/422-7233
IEEE	Institute of Electrical and Electronics Engineers 3 Park Avenue, 17th Floor New York, NY 10016-5997 www.ieee.org	212/419-7900
IES	Illuminating Engineering Society 120 Wall Street, Floor 17 New York, NY 10005-4001 www.ies.org	212/248-5000
ITRK	Intertek Testing Services 3933 US Route 11 Cortland, NY 13045 www.intertek.com	607/753-6711
MCAA	Mechanical Contractors Association of America 1385 Piccard Drive Rockville, MD 20850 www.mcaa.org	301/869-5800
MMPA (formerly WMMPA)	Moulding & Millwork Producers Association (formerly Wood Moulding & Millwork Producers Association) 507 First Street Woodland, CA 95695 www.wmmpa.com	530/661-9591 800/550-7889
MSS	Manufacturers Standardization Society (MSS) of the Valve and Fittings Industry, Inc. 127 Park Street, NE Vienna, VA 22180-4602 http://mss-hq.org	703/281-6613
NAAMM	National Association of Architectural Metal Manufacturers 800 Roosevelt Rd. Bldg. C, Suite 312 Glen Ellyn, IL 60137 www.naamm.org	630/942-6591

NAIMA	North American Insulation Manufacturers Association P.O. Box 1906 Alexandria, VA 22313 https://insulationinstitute.org/	703/684-0084
NALP	National Association of Landscape Professionals (formerly Professional Landcare Network) 12500 Fair Lakes Circle, Suite 200 Fairfax, VA 22033 https://www.landscapeprofessionals.org/	703/736-9666
NAPA	National Asphalt Pavement Association 6406 Ivy Lane, Suite 350 Greenbelt, MD 20770-1441 www.asphaltpavement.org	888/468-6499 301/731-4748
NCSPA	National Corrugated Steel Pipe Association 14070 Proton Road, Suite 100 Dallas, TX 75244 www.ncspa.org	972/850-1907
NCMA	National Concrete Masonry Association 13750 Sunrise Valley Drive Herndon, VA 20171-4662 www.ncma.org	703/713-1900
NEBB	National Environmental Balancing Bureau 8575 Grovemont Circle Gaithersburg, MD 20877 www.nebb.org	301/977-3698
NECA	National Electrical Contractors Association 1201 Pennsylvania Ave. NW Washington, D.C., 20004 www.necanet.org	202/991-6300
NEMA	National Electrical Manufacturers Association 1300 North 17th Street N, Suite 900 Rosslyn, VA 22209 www.nema.org	703/841-3200
NEII	National Elevator Industry, Inc. 5537 SW Urish Road Topeka, KS 66610 https://nationalelevatorindustry.org/	703/589-9985
NFPA	National Fire Protection Association 1 Batterymarch Park Quincy, MA 02169-7471 www.nfpa.org	800/344-3555 855/274-8525

NGA (formerly GANA)	National Glass Association (merged with Glass Association of North America) 1945 Old Gallows Road Suite 750 Vienna, VA 22182 www.glass.org	866/342-5642 Ext 127
NHLA	National Hardwood Lumber Association PO Box 34518 Memphis, TN 38184 www.nhla.com	901/377-1818
NIA	National Insulation Association 516 Herndon Pkwy., Ste. D Herndon, VA 20170 www.insulation.org	703/464-6422
NRCA	National Roofing Contractors Association 10255 W. Higgins Road, Suite 600 Rosemont, IL 60018-5607 www.nrca.net	847/299-9070
NSF	NSF International 789 N. Dixboro Road Ann Arbor, MI 48113-0140 www.nsf.org	800/673-6275 734/769-8010
NSI	Natural Stone Institute (formerly Marble Institute of America) 380 E. Lorain St. Oberlin, OH 44074 https://www.naturalstoneinstitute.org/	440/250-9222
NTMA	National Terrazzo and Mosaic Association 209 N. Crockett Street, Suite 2 PO Box 2605 Fredericksburg, TX 78624 www.ntma.com	800/323-9736
OSHA	Occupational Safety and Health Act U.S. Department of Labor Occupational Safety & Health Administration 200 Constitution Ave., NW Washington, DC 20210 www.osha.gov	800/321-OSHA (6742)

PCA	Portland Cement Association 5420 Old Orchard Road Skokie, IL 60077 or 200 Massachusetts Ave NW, Suite 200 Washington, DC 20001 www.cement.org	847/966-6200 202/408-9494
PCA	Painting Contractors Association (formerly Painting and Decorating Contractors of America) 2316 Millpark Drive Maryland Heights, MO 63043 https://www.pcapainted.org/	800/322-7322
PCI	Precast/Prestressed Concrete Institute 8770 W. Bryn Mawr Ave., Suite 1150 Chicago, IL 60631 www.pci.org	312/786-0300
PDI	Plumbing & Drainage Institute 800 Turnpike Street, Suite 300 North Andover, MA 01845 http://pdionline.org	978/557-0720 800/589-8956
PEI	Porcelain Enamel Institute, Inc. P.O. Box 920220 Norcross, GA 30010 www.porcelainenamel.com	770/676-9366
PG&E	Pacific Gas & Electric Company P.O. Box 997300 Sacramento, CA 95899-7300 www.pge.com	800/743-5000
PLIB	Pacific Lumber Inspection Bureau (formerly West Coast Lumber Inspection Bureau) 1010 South 336th Street, Suite 210 Federal Way, WA 98003-7394 https://www.plib.org/	253/835-3344
RFCI	Resilient Floor Covering Institute 115 Broad Street, Suite 201 La Grange, GA 30240 www.rfci.com	706/882-3833
SDI	Steel Deck Institute P.O. Box 426 Glenshaw, PA 15116 www.sdi.org	412/487-3325

SDI	Steel Door Institute 30200 Detroit Road Westlake, OH 44145 www.steeldoor.org	440/899-0010
SJI	Steel Joist Institute 140 West Evans Street, Suite 203 Florence, SC 29501 http://steeljoist.org	843/407-4091
SMA	Stucco Manufacturers Association 5753 E Santa Ana Cyn Rd, #G-156 Anaheim, CA 92807 www.stuccomfgassoc.com	714/473-9579
SMACNA	Sheet Metal and Air Conditioning Contractors' National Association 4201 Lafayette Center Drive Chantilly, VA 20151-1219 www.smacna.org	703/803-2980
SPI	SPI: The Plastics Industry Trade Association, Inc. 1425 K St. NW, Suite 500 Washington, DC 20005 www.plasticsindustry.org	202/974-5200
TCA	The Tile Council of North America 100 Clemson Research Blvd. Anderson, SC 29625 www.tcnatile.com	864/646-8453
TPI	Truss Plate Institute 2670 Crain Highway, Suite 203 Waldorf, MD 20601 www.tpinst.org	240/587-5582
TPI	Turfgrass Producers International 444 E. Roosevelt Road #346 Lombard, IL 60148 www.turfgrasssod.org	800/405-8873 847/649-5555
TCIA	Tree Care Industry Association (formerly the National Arborist Association) 670 N Commercial Street, Suite 201 Manchester, NH 03101 www.tcia.org	603/314-5380 800/733-2622

TVI	The Vermiculite Institute c/o The Schundler Company 10 Central Street Nahant, MA 01908 www.vermiculiteinstitute.org	732/287-2244
UL	Underwriters Laboratories Inc. 333 Pfingsten Road Northbrook, IL 60062-2096 www.ul.com	847/272-8800 877/854-3577
UNI	Uni-Bell PVC Pipe Association 201 E. John Carpenter Freeway, Suite 750 Irving, TX 75062 www.uni-bell.org	972/243-3902
USDA	U.S. Department of Agriculture 1400 Independence Ave., S.W. Washington, DC 20250 www.usda.gov	202/720-2791
WA	Wallcoverings Association 35 E Wacker Dr., Suite 850 Chicago, IL 60601 www.wallcoverings.org	312/224-2574
WCMA	Window Covering Manufacturers Association 355 Lexington Avenue 15th Floor New York, NY 10017 www.wcmanet.org	212/297-2122
WDMA	Window & Door Manufacturers Association 2001 K Street NW, 3rd Floor North Washington, D.C. 20006 www.wdma.com	202/367-1157
WI	Woodwork Institute 1455 Response Road, Suite 110 Sacramento, CA 95815 www.wicnet.org	916/372-9943
WRI	Wire Reinforcement Institute 942 Main Street, Suite 300 Hartford, CT 06103 www.wirereinforcementinstitute.org	860/240-9545
WWCA	Western Wall & Ceiling Contractors Association 1910 N. Lime St. Orange, CA 92865 www.wwcca.org	714/221-5520

WWPA	Western Wood Products Association (formerly Redwood Inspection Service) 1500 SW First Ave., Suite 870 Portland, OR 97201 www.wwpa.org	503/224-3930
------	--	--------------

PART 2 - PRODUCTS Not Used.

PART 3 - EXECUTION Not Used.

END OF DOCUMENT

MATERIALS AND EQUIPMENT

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Purchase of Materials and Equipment;
- B. Special Conditions;
- C. Imported Materials Certification.

1.02 MATERIAL AND EQUIPMENT

- A. Only items approved by the District and/or Design Professional shall be used.
- B. Contractor shall submit lists of products and other product information in accordance with the Contract Documents, including, without limitation, the provisions regarding the submittals.

1.03 MATERIAL AND EQUIPMENT COLORS

- A. The District and/or Architect will provide a schedule of colors.
- B. No individual color selections will be made until after approval of all pertinent materials and equipment and after receipt of appropriate samples in accordance with the Contract Documents, including, without limitation, the provisions regarding the submittals.
- C. Contractor shall request priority in writing for any item requiring advance ordering to maintain the approved Construction Schedule.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. Contractor shall deliver manufactured materials in original packages, containers, or bundles (with seals unbroken), bearing name or identification mark of manufacturer.
- B. Contractor shall deliver fabrications in as large assemblies as practicable; where specified as shop-primed or shop-finished, package or crate as required to preserve such priming or finish intact and free from abrasion.
- C. Contractor shall store materials in such a manner as necessary to properly protect them from damage. Materials or equipment damaged by handling, weather, dirt, or from any other cause will not be accepted.

- D. Materials are not acceptable that have been warehoused for long periods of time, stored or transported in improper environment, improperly packaged, inadequately labeled, poorly protected, excessively shipped, deviated from normal distribution pattern, or reassembled.
- E. Contractor shall store material so as to cause no obstructions of sidewalks, roadways, access to the Site or buildings, and underground services. Contractor shall protect material and equipment furnished under Contract.
- F. Contractor may store materials on Site with prior written approval by the District, all material shall remain under Contractor's control and Contractor shall remain liable for any damage to the materials. Should the Project Site not have storage area available, the Contractor shall provide for off-site storage at a bonded warehouse and with appropriate insurance coverage at no cost to District.
- G. When any room in Project is used as a shop or storeroom, the Contractor shall be responsible for any repairs, patching, or cleaning necessary due to that use. Location of storage space shall be subject to prior written approval by District.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Manufacturers listed in various sections of Contract Documents are names of those manufacturers that are believed to be capable of supplying one or more of items specified therein.
- B. The listing of a manufacturer does not imply that every product of that manufacturer is acceptable as meeting the requirements of the Contract Documents.

2.02 FACILITIES AND EQUIPMENT

Contractor shall provide, install, maintain, and operate a complete and adequate facility for handling, the execution, disposal, and distribution of material and equipment as required for proper and timely performance of Work connected with Contract.

2.03 MATERIAL REFERENCE STANDARDS

Where material is specified solely by reference to "standard specifications" and if requested by District, Contractor shall submit for review data on actual material proposed to be incorporated into Work of Contract listing name and address of vendor, manufacturer, or producer, and trade or brand names of those materials, and data substantiating compliance with standard specifications.

PART 3 - EXECUTION

3.01 WORKMANSHIP

- A. Where not more specifically described in any other Contract Documents, workmanship shall conform to methods and operations of best standards and accepted practices of trade or trades involved and shall include items of fabrication, construction, or installation regularly furnished or required for completion (including finish and for successful operation, as intended).
- B. Work shall be executed by tradespersons skilled in their respective lines of Work. When completed, parts shall have been durably and substantially built and present a neat appearance.

3.02 COORDINATION

- A. Contractor shall coordinate installation of Work so as to not interfere with installation of others. Adjustment or rework because of Contractor's failure to coordinate will be at no additional cost to District.
- B. Contractor shall examine in-place work for readiness, completeness, fitness to be concealed or to receive other work, and in compliance with Contract Documents. Concealing or covering Work constitutes acceptance of additional cost which will result should in-place Work be found unsuitable for receiving other Work or otherwise deviating from the requirements of the Contract Documents.

3.03 COMPLETENESS

Contractor shall provide all portions of the Work, unless clearly stated otherwise, installed complete and operational with all elements, accessories, anchorages, utility connections, etc., in manner to assure well-balanced performance, in accordance with manufacturer's recommendations and by Contract Documents. Terms such as "installed complete," "operable condition," "for use intended," "connected to all utilities," "terminate with proper cap," "adequately anchored," "patch and refinish," "to match similar," should be assumed to apply in all cases, except where completeness of functional or operable condition is specifically stated as not required.

3.04 APPROVED INSTALLER OR APPLICATOR

Installation by a manufacturer's approved installer or applicator is an understood part of Specifications and only approved installer or applicator is to provide on-site Work where specified manufacturer has on-going program of approving (i.e. certifying, bonding, re-warranting) installers or applicators. Newly established relationships between a manufacturer and an installer or applicator who does not have other approved applicator work in progress or completed is not approved for this Project.

3.05 MANUFACTURER'S RECOMMENDATIONS

All installations shall be in accordance with manufacturer's published recommendations and specific written directions of manufacturer's representative.

Should Contract Documents differ from recommendations of manufacturer or directions of his representative, Contractor shall analyze differences, make recommendations to the District and the Architect in writing, and shall not proceed until interpretation or clarification has been issued by the District and/or the Architect.

END OF DOCUMENT

QUALITY CONTROL

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Inspector, Inspections and Tests, Uncovering of Work and Non-conforming of Work and Correction of Work;
- B. Special Conditions.

1.02 RELATED CODES:

- A. The Work is governed by requirements of Title 24, California Code of Regulations ("CCR"), and the Contractor shall keep a copy of these available at the job Site for ready reference during construction.
- B. The Division of the State Architect ("DSA") shall be notified at or before the start of construction.

1.03 OBSERVATION AND SUPERVISION:

- A. The District and Architect or their appointed representatives will review the Work and the Contractor shall provide facilities and access to the Work at all times as required to facilitate this review. Administration by the Architect and any consulting Structural Engineer will be in accordance with applicable regulations, including, without limitation, CCR, Part 1, Title 24, Section 4-341.
- B. One or more Project Inspector(s) approved by DSA and employed by or in contract with the District, referred to hereinafter as the "Project Inspector", will observe the work in accordance with CCR, Part 1, Title 24, Sections 4-333(b) and 4-342:
 - (1) The Project Inspector and Special Inspector(s) shall have access to the Work wherever it is in preparation or progress for ascertaining that the Work is in accordance with the Contract Documents and all applicable code sections. The Contractor shall provide facilities and operation of equipment as needed, and access as required and shall provide assistance for sampling or measuring materials.
 - (2) The Project Inspector will notify the District and Architect and call the attention of the Contractor to any observed failure of Work or material to conform to Contract Documents.

The Contractor shall conform with all applicable laws as indicated in the Contract Documents, including, without limitation, to CCR, Part 1, Title 24, Section 4-343.

The Contractor shall supervise and direct the Work and maintain a competent superintendent on the job who is authorized to act in all matters pertaining to the Work. The Contractor's superintendent shall also inspect all materials, as they arrive, for compliance with the Contract Documents. Contractor shall reject defective Work or materials immediately upon delivery or failure of the Work or material to comply with the Contract Documents. The Contractor shall submit verified reports as indicated in the Contract Documents, including, without limitation, the Specifications and as required by Part 1, Title 24, Section 4-336.

1.04 TESTING AGENCIES:

- A. Testing agencies and tests shall be in conformance with the General Documents and the requirements of Part 1, Title 24, Section 4- 335.
- B. Testing and inspection in connection with earthwork shall be under the direction of the District's consulting soils engineer, if any, referred to hereinafter as the "Soils Engineer."
- C. Testing and inspection of construction materials and workmanship shall be performed by a qualified laboratory, referred to hereinafter as the "Testing Laboratory." The Testing Laboratory shall be under direction of an engineer registered in the State of California, shall conform to requirements of ASTM E329, and shall be employed by or in contract with the District.
- D. Testing laboratory shall be approved by the Architect and the Division of the State Architect.
- E. Owner will employ and pay for services of an independent testing labatory to perform specified inspection and testing. Retesting cost for failed test will be Contractors responsibilityand will be back-charged against the contract.

1.05 TESTS AND INSPECTIONS:

- A. The Contractor shall be responsible for notifying the District and Project Inspector of all required tests and inspections. Contractor shall notify the District and Project Inspector at least seventy-two hours (72) hours in advance of performing any Work requiring testing or inspection.
- B. The Contractor shall provide access to Work to be tested and furnish incidental labor, equipment, and facilities to facilitate all inspections and tests.
- C. The District will pay for first inspections and tests required by the "CCR", and other inspections or tests that the District and/or the Architect may direct to have made, including the following principal items:
 - (1) Tests and observations for earthwork and paving.
 - (2) Tests for concrete mix designs, including tests of trial batches.
 - (3) Tests and inspections for structural steel work.
 - (4) Field tests for framing lumber moisture content.

- (5) Additional tests directed by the District that establish that materials and installation comply with the Contract Documents.
 - (6) Tests and observations of welding and expansion anchors.
- D. The District may at its discretion, pay and then back charge the Contractor for:
 - (1) Retests or reinspections, if required, and tests or inspections required due to Contractor error or lack of required identifications of material.
 - (2) Uncovering of work in accordance with Contract Documents.
 - (3) Testing done on weekends, holidays, and overtime will be chargeable to the Contractor for the overtime portion.
 - (4) Testing done off Site.
- E. Testing and inspection reports and certifications:
 - (1) If initially received by Contractor, Contractor shall provide to each of the following a copy of the agency or laboratory report of each test or inspection or certification.
 - (a) The District;
 - (b) The Construction Manager, if any;
 - (c) The Architect;
 - (d) The Consulting Engineer, if any;
 - (e) Other engineers on the Project, as appropriate;
 - (f) The Project Inspector; and
 - (g) The Contractor.
 - (2) When the test or inspection is one required by the CCR, a copy of the report shall also be provided to the DSA.

1.06 LABORATORY REPORTS

- A. After each inspection and test, promptly submit two copies of laboratory report to Owner, Architect, Contractor and DSA.
- B. Include:
 - (1) Date of issue,
 - (2) DSA Application and File numbers,
 - (3) Project title and number,

- (4) Name of inspector,
- (5) Date and time of sampling or inspection,
- (6) Identification of product and Specification Section,
- (7) Location in the Project,
- (8) Type of inspection or test,
- (9) Date of test,
- (10) Results of test,
- (11) Conformance with Contract Documents.

C. When requested by Architect, provide interpretation of test results.

1.07 LIMITS ON TESTING LABORATORY AUTHORITY

- A. Laboratory may not release, revoke, alter or enlarge on requirements of Contract Documents.
- B. Laboratory may not approve or accept any portion of the work.
- C. Laboratory may not assume any duties of Contractor.
- D. Laboratory has no authority to stop the work.

PART 2 - PRODUCTS

2.01 TYPE OF TEST AND INSPECTIONS

- A. Testing and inspection shall be in accordance with DSA Form 103 (or current version)
- B. Slump Test
ASTM C 143
- C. Concrete Tests

Testing agency shall test concrete used in the work per the following paragraphs:

- (1) Compressive Strength:
 - (a) Minimum number of tests required: One (1) set of three (3) cylinders for each 100 cubic yards (Sec. 2604(h) 01) of concrete or major fraction thereof, placed in one (1) day. See Title 24, Section 2605(g).

- (b) Two cylinders of each set shall be tested at twenty-eight (28) days. One (1) cylinder shall be held in reserve and tested only when directed by the Architect or District.
- (c) Concrete shall test the minimum ultimate compressive strength in twenty-eight 28 days, as specified on the structural drawings.
- (d) In the event that the twenty-eight (28) day test falls below the minimum specified strength, the effective concrete in place shall be tested by taking cores in accordance with UBC Standard No. 26-13 and tested as required for cylinders.
- (e) In the event that the test on core specimens falls below the minimum specified strength, the concrete will be deemed defective and shall be removed and replaced upon such direction of the Architect, and in a manner acceptable to the Division of the State Architect.

D. Reinforcing, Steel

PART 3 - EXECUTION Not Used.

END OF DOCUMENT

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Administrative and procedural requirements related to inspections, tests, and related quality control procedures required to be performed by the Contractor and that facilitate the Contractor's compliance with the Contract Documents.

1.2 RELATED REQUIREMENTS

- A. Section 01 3300, Submittal Procedures; submission of manufacturers' instructions and certificates.
- B. Section 01 4523, Testing and Inspecting Services, and DSA 103; Special Tests and Inspections required by authorities having jurisdiction and are the responsibility of Owner.
- C. Section 01 7700, Closeout Procedures.
- D. Specific requirements for testing, inspections, mockups, and other quality control requirements as described in the various Sections of the Specifications.

1.3 DEFINITIONS

- A. Experienced: When used with an entity or individual, and unless otherwise specified, means having successfully completed a minimum of three previous projects similar in nature, size, and extent to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.
- B. Field Quality-Control Tests: Tests and inspections that are performed on-site for installation of the Work and for completed Work.
- C. Installer/Applicator/Erector: Contractor or another entity engaged by Contractor as an employee, subcontractor, or sub-subcontractor, to perform a particular construction operation, including installation, erection, application, assembly, and similar operations.
- D. Mockups: Full-size, physical assemblies that are constructed on-site and in-place mockups to demonstrate aesthetic effects and, where indicated, qualities of materials and execution, and to review construction, coordination, interface, testing, and operation of various building components. Mockups are not samples.
- E. Tests: Procedures intended to establish the quality, performance, or reliability of a product or system conducted by a qualified Testing Agency.
- F. Source Quality-Control Tests: Tests and inspections related to materials manufactured or fabricated away from the jobsite that will be incorporated into the work.

FIELD QUALITY CONTROL PROCEDURES
SECTION 01 4516
3595001

- G. Testing Agency: An independent entity engaged to perform specific tests, inspections, or both, is qualified to operate in California, and meets the additional requirements specified.
 - 1. Testing laboratory shall mean the same as Testing Agency.
- H. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.
- I. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that actual products incorporated into the Work and completed construction comply with requirements. Contractor's quality-control services do not include Contract administration activities performed by Architect.

1.4 REFERENCES AND STANDARD SPECIFICATIONS

- A. General:
 - 1. The Contract Documents contain references to various standard specifications, codes, practices, and requirements for materials, work quality, installation, inspections, and tests published and issued by the organizations, societies, and associations.
 - 2. Contractor shall obtain its own copies of required specified referenced publications.
 - 3. The specification or standard referred to shall have full force and effect as though printed in these Specifications.
 - 4. When the effective date of a reference standard is not specified, it shall be understood that the current edition or latest revision thereof and any amendments or supplements thereto in effect on the date of the DSA approval, shall govern the Work.
 - 5. The contractual relationships, duties, and responsibilities of the parties in Contract or those of the Architect shall not be altered from the Contract Documents by mention or inference otherwise in any reference document.
- B. Products or workmanship specified by association, trade, or other consensus standards shall comply with requirements of the referenced standard or specification except when more rigid requirements are specified or are required by applicable codes.
- C. Conflicting Requirements:
 - 1. If compliance with two or more standards or requirements are specified and the standards or requirements establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement.
 - 2. Refer conflicting requirements that are different, but apparently equal, to Architect for direction before proceeding.

1.5 ADMINISTRATIVE REQUIREMENTS

- A. Submittal Procedures:
 - 1. Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
 - 2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.

1.6 INFORMATIONAL SUBMITTALS

- A. Schedule of Tests and Inspections.
- B. Field Superintendent's Quality Control Responsibilities
- C. Procedures for inspection prior to subsequent Work or cover up.
- D. Qualifications of Contractor's Testing Agencies.
- E. Certified copies of Reports and Documents.

1.7 CLOSEOUT SUBMITTALS

- A. Permits, Licenses, and Certificates: Copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents established for compliance with standards and regulations bearing on performance of the Work.
- B. Test and Inspection Log including final record for each test and inspection as specified in Part 3 and in accordance with Section 01 7839, Project Record Documents.

1.8 REPORTS AND DOCUMENTS

- A. Test and Inspection Reports: Prepare and submit certified written reports where specified in the Specification Sections. Include the following:
 - 1. Date of issue.
 - 2. Project title and number.
 - 3. Name, address, and telephone number of testing agency.
 - 4. Dates and locations of samples and tests or inspections.
 - 5. Names of individuals making tests and inspections.
 - 6. Description of the Work and test and inspection method.
 - 7. Identification of product and Specification Section.
 - 8. Complete test or inspection data.
 - 9. Test and inspection results and an interpretation of test results.
 - 10. Record of temperature and weather conditions at time of sample taking and testing and inspecting.

FIELD QUALITY CONTROL PROCEDURES
SECTION 01 4516
3595001

11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
12. Name and signature of laboratory inspector.
13. Recommendations on retesting and re-inspecting.

1.9 QUALITY ASSURANCE

- A. Minimum Quantity or Quality Levels:
1. The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements.
 2. Refer uncertainties to Architect for a decision before proceeding.
- B. Use of trade-specific terminology in referring to a trade or entity does not require that certain construction activities be performed by accredited or unionized individuals, or that requirements specified apply exclusively to specific trade(s).
- C. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce Work of specified quality.
- D. Correct conditions or workmanship not in conformance with specified standards or quality. Do so immediately after non-conformance item is discovered or within a reasonable time frame agreed upon with Construction Manager.
- E. Comply with manufacturers' instructions, including each step in sequence. Should manufacturers' instructions conflict with Contract Documents, request clarification from the Architect before proceeding.
- F. Comply with specified standards as minimum quality for the Work, except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.
- G. Perform Work by persons qualified to produce required and specified quality.
- H. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, or disfigurement.
- I. Upon delivery to the jobsite, materials and products shall be inspected for compliance with the Project Specifications.
1. Nonconforming materials, products, equipment, hardware, tools and/or safety devices shall be removed immediately from the general work area and stored within a secured area approved by the Owner as "NON CONFORMING MATERIALS AREA" to ensure that defective or nonconforming materials are not incorporated into or used on the project
 2. Materials or products shall not be removed from the designated area until they are deemed by the Architect to be in compliance, or until they are modified or fixed to

meet the project specifications, or until they are removed from the jobsite for the purposes of disposal or shipment back to the manufacturer.

1.10 CONTRACTORS TESTING AGENCY

- A. Qualifications: At Contractor's expense, provide an independent testing laboratory nationally recognized according to 29 CFR 1910.7 and accredited according to NIST's National Voluntary Laboratory Accreditation Program (NVLAP,) or other independent agency with the experience and capability to conduct testing and inspecting indicated, documented according to ASTM E329; with additional qualifications specified in individual Sections; and, where required, that is acceptable to authorities having jurisdiction.
- B. Testing Agency shall cooperate with Architect, Construction Manager, Owner's Project Inspector, and Contractor in performance of duties.
- C. Testing Agency shall provide qualified personnel to perform required tests and inspections.
- D. Testing Agency shall not be authorized to release, revoke, alter, or increase the Contract Document requirements, approve or accept any portion of the Work, or perform any duties of Contractor.

1.11 TESTS AND INSPECTIONS

- A. Preconstruction Testing: Where preconstruction testing is specified to verify performance requirements, comply with the following as applicable:
 - 1. Contractor Responsibilities:
 - a. Provide test specimens representative of proposed products and construction.
 - b. Submit specimens in a timely manner with sufficient time for testing and analyzing results to prevent delaying the Work.
 - c. Provide sizes and configurations of test assemblies, mockups, and laboratory mockups to adequately demonstrate capability of products to comply with performance requirements.
 - d. Build site-assembled test assemblies and mockups using installers who will perform same tasks for Project.
 - e. Build laboratory mockups at testing facility using personnel, products, and methods of construction indicated for the completed Work.
 - f. When testing is complete, remove test specimens, assemblies, and mockups; do not reuse products on Project unless approved by Architect in writing.
- B. Tests and Inspections indicated in individual Specification Sections shall be conducted by a qualified Testing Agency. The responsibilities of the Testing Agency shall be as follows:

FIELD QUALITY CONTROL PROCEDURES
SECTION 01 4516
3595001

1. Verifying that manufacturer maintains detailed fabrication and quality-control procedures and reviews the completeness and adequacy of those procedures to perform the Work.
 2. Notifying Architect, Construction Manager, Owner's Project Inspector, and Contractor promptly of irregularities and deficiencies observed in the Work during performance of its services.
 3. Submit a certified written report of each test, inspection, and similar quality-control service to Architect, Construction Manager, and Owner's Project Inspector with copy to Contractor and to DSA.
 4. Submit a final report of tests and inspections at Substantial Completion which includes a list of unresolved deficiencies.
 5. Interpret tests and inspections and stating in each report whether tested and inspected work complies with or deviates from the Contract Documents.
 6. Retest and reinspect corrected work.
- C. Monitoring and Documentation: Contractor shall maintain testing and inspection reports including log of approved and rejected results as specified in Part 3.
1. Include work Architect has indicated as nonconforming or defective.
 2. Indicate corrective actions taken to bring nonconforming work into compliance with requirements.
 3. Comply with requirements of the California Division of the State Architect (DSA).

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 NOTIFICATIONS

- A. Contractor shall provide the following notifications;
1. Owner's Project Inspector writing:
 - a. 24 hours in advance of starting new Work
 - b. 24 hours in advance of each test or inspection
 2. 48 hours' prior notice, minimum, to the Testing Agency for required tests and inspections.

3.2 TEST AND INSPECTION FIELD BINDER

- A. Contractor shall maintain in the Field Office a Test and Inspection Field Binder that includes a hard copy of the following documents:
1. Approved Quality Control Plan.
 2. Specification Sections that apply to the respective portions of work.
 3. RFI's, CCD's or other approved document that changes the work.

4. Manufacturer's Installation Instructions (MII).
5. Specific details of the Work as requested by the Inspector.
6. Test and Inspection Log.

3.3 TEST AND INSPECTION LOG

- A. Prepare and maintain a record of tests and inspections using an electronic spreadsheet.
- B. Include the following information:
 1. Date test or inspection was conducted.
 2. Description of the Work tested or inspected.
 3. List pertinent detail/sheet number.
 4. List pertinent Specification Section.
 5. Attach manufacturer's installation inspections if applicable.
 6. List and attach RFI's, ASI's or CCD's affecting the Work.
 7. Date Inspector verified work is acceptable.
- C. Final record for each test and inspection shall be submitted on Contractors letterhead and include the name of the responsible person to verify Work was in accordance with the approved Contract Documents.

3.4 MANUFACTURERS' FIELD SERVICES

- A. When specified in respective Specification Sections, Contractor shall require supplier or manufacturer to provide qualified personnel to observe field conditions, conditions of surfaces and installation, quality of workmanship, start-up of equipment, testing, adjusting and balancing of equipment as applicable, and to make appropriate recommendations. Contractor is responsible for proper notification of manufacturer's representative before installation of applicable work and for obtaining necessary inspection certificate stating that installation was observed and approved.
- B. Product Performance Verification: The supplier of products specified based on performance criteria shall, at the request of the Agency, inspect the installed product and certify conformance of the product to specified criteria under the installed conditions.
- C. Manufacturer's representative shall submit written report to the Architect listing observations and recommendations.

3.5 TOLERANCES - GENERAL

- A. Monitor tolerance control of installed products or portions to produce acceptable Work. Do not permit tolerances to accumulate.
- B. Comply with manufacturers' tolerances. Should manufacturers' tolerances conflict with Contract Documents, request clarification from Architect before proceeding.
- C. Adjust products to appropriate dimensions; position before securing products in place.

FIELD QUALITY CONTROL PROCEDURES
SECTION 01 4516
3595001

3.6 DIMENSIONING AND TOLERANCES FOR ACCESSIBILITY

- A. While it is recognized that construction practices generally permit a level of reasonable dimensional tolerance, the installation of items subject to compliance with the Americans with Disabilities Act Accessibility Guidelines and Chapter 11B of the California Building Code, typically does not allow such tolerances. Therefore, these dimensions are to be considered absolute and will be strictly enforced. Items found to be out of tolerance may require modification and/or replacement at Contractor's expense.

3.7 REPAIR AND PROTECTION

- A. On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.
 - 1. Provide materials and comply with installation requirements specified in other Specification Sections or matching existing substrates and finishes.
 - 2. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible. Comply with the Contract Document requirements for cutting and patching in Section 01 7329, Cutting and Patching.
- B. Protect construction exposed by or for quality-control service activities.
- C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

END OF SECTION

p:\sacramento\3595 tracy unified school district\001-000_villalovoz es new shade structures\08 specifications\06 spec\04 final\freiler - shade struct\01 4516_field quality control procedures.docx
Last Updated: August 28, 2020

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Requirements for Testing Laboratory.
 - 2. Contractor's responsibilities for facilitation of Testing and Inspections.

1.2 RELATED SECTIONS AND DOCUMENTS

- A. Geologic Hazards & Soils Report.
- B. DSA 103 - Structural Test & Inspections List.
- C. Section 13 3423, Relocatable Buildings.
- D. Division 23, Mechanical Work - Testing, adjusting, and balancing of systems.
- E. Section 31 0000, Earthwork.
- F. Individual Specification Sections: Inspections and tests required, and standards for testing.

1.3 REFERENCES

- A. California Administrative Code (CAC), edition as noted on the drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Building Code (CBC), edition as noted on the drawings, as adopted by the California Division of the State Architect (DSA).

1.4 SELECTION AND PAYMENT

- A. Testing laboratory shall be approved by both the Architect and the Division of the State Architect.
- B. Owner will employ and pay for services of an independent testing laboratory to perform specified inspection and testing. Retesting costs for failed tests will be the Contractors responsibility and will be back-charged against the contract.
- C. Under provisions for Relocatable Building construction, Owner limits his exposure to in-plant inspection and testing costs. Refer to other Specification Sections related to such specific construction.
- D. Employment of testing laboratory shall in no way relieve Contractor of obligation to perform work in accordance with requirements of Contract Documents.

TESTING AND INSPECTION SERVICES

SECTION 01 4523

3595001

1.5 LABORATORY REPORTS

- A. After each inspection and test, promptly submit two copies of laboratory report to Owner, Architect, Contractor and DSA.
- B. Include:
 - 1. Date of issue,
 - 2. DSA Application and File numbers,
 - 3. Project title and number,
 - 4. Name of inspector,
 - 5. Date and time of sampling or inspection,
 - 6. Identification of product and Specification Section,
 - 7. Location in the Project,
 - 8. Type of inspection or test,
 - 9. Date of test,
 - 10. Results of test,
 - 11. Conformance with Contract Documents.
- C. When requested by Architect, provide interpretation of test results.

1.6 LIMITS ON TESTING LABORATORY AUTHORITY

- A. Laboratory may not release, revoke, alter or enlarge on requirements of Contract Documents.
- B. Laboratory may not approve or accept any portion of the work.
- C. Laboratory may not assume any duties of Contractor.
- D. Laboratory has no authority to stop the work.

1.7 CONTRACTOR RESPONSIBILITIES

- A. Deliver to laboratory at designated location, adequate samples of materials proposed to be used which require testing, along with proposed mix designs. Allow reasonable time for review and testing.
- B. Arrange for, and coordinate with, laboratory for all required testing and inspection. Provide adequate notice, in advance, for proper scheduling and processing of testing. The Inspector will not be responsible for scheduling or arranging for testing and inspection services.
- C. Cooperate with laboratory personnel, and provide access to the work and to manufacturer's facilities.
- D. Provide incidental labor and facilities to provide access to work to be tested, to obtain and handle samples at the site or at the source of products to be tested, to facilitate tests and inspections, storage and curing of test samples.

TESTING AND INSPECTION SERVICES
SECTION 01 4523
3595001

- E. Notify Architect, Inspector, Structural Engineer (when applicable) and laboratory 24 hours prior to expected time for operations requiring inspection and testing services.

END OF SECTION

*p:\sacramento\3595 tracy unified school district\001-000_villalovo es new shade structures\08 specifications\06 spec\04 final\freiler
- shade struct\01 4523_testing and inspection services.docx
Last Updated: December 16, 2021*

TEMPORARY FACILITIES AND CONTROLS

PART 1 – GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions;
- B. Special Conditions;
- C. Site Standards; and
- D. Construction Waste Management and Disposal.

1.02 TEMPORARY UTILITIES:

A. Electric Power and Lighting:

- (1) Contractor will pay for power during the course of the Work. To the extent power is available in the building(s) or on the Site, Contractor may use the District's existing utilities by making prearranged payments to the District for the utilities used by Contractor and all Subcontractors. Contractor shall be responsible for providing temporary facilities required to deliver that power service from its existing location in the building(s) or on the Site to point of intended use.
- (2) Contractor shall verify characteristics of power available in building(s) or on the Site. Contractor shall take all actions required to make modifications where power of higher voltage or different phases of current are required. Contractor shall be fully responsible for providing that service and shall pay all costs required therefor.
- (3) Contractor shall furnish, wire for, install, and maintain temporary electrical lights wherever it is necessary to provide illumination for the proper performance and/or observation of the Work: a minimum of 20 foot-candles for rough work and 50 foot-candles for finish work.
- (4) Contractor shall be responsible for maintaining existing lighting levels in the project vicinity should temporary outages or service interruptions occur.

B. Water:

- (1) Contractor shall pay for water used during the course of the Work. Contractor shall coordinate and pay for installation or use of water meter in compliance with local water agency requirements. To the

extent water is then available in the building(s) or on the Site, Contractor may use the District's existing utilities by making prearranged payments to the District for the utilities used by Contractor and all Subcontractors. Contractor shall be responsible for providing temporary facilities required to deliver such utility service from its existing location in the building(s), on the Site, or other location approved by the local water agency, to point of intended use.

- (2) Contractor shall use backflow preventers on water lines at point of connection to District's water supply. Backflow preventers shall comply with requirements of Uniform Plumbing Code.
- (3) Contractor shall make potable water available for human consumption.

C. Sanitary Facilities:

- (1) Contractor shall provide sanitary temporary facilities in no fewer numbers than required by law and such additional facilities as may be directed by the Inspector for the use of all workers. The facilities shall be maintained in a sanitary condition at all times and shall be left at the Site until removal is directed by the Inspector or Contractor completes all other work at the Site.
- (2) Use of toilet facilities in the Work under construction shall not be permitted except by consent of the Inspector and the District.

D. Fire Protection:

- (1) Contractor shall provide and maintain fire extinguishers and other equipment for fire protection. Such equipment shall be designated for use for fire protection only and shall comply with all requirements of the California Fire, State Fire Marshall and/or its designee.
- (2) Where on-site welding and burning of steel is unavoidable, Contractor shall provide protection for adjacent surfaces.

E. Trash Removal:

- (1) Contractor shall provide trash removal on a timely basis. Under no circumstance shall Contractor use District trash service.

F. Field Office:

- (1) If Contractor chooses to provide a field office, it shall be an acceptable construction trailer that is well-lit and ventilated. The construction trailer shall be equipped with shelves, desks, filing cabinet, chairs, and such other items of equipment needed. Trailer and equipment are the property of the Contractor and must be removed from the Site upon completion of the Work.
- (2) Contractor shall provide any additional electric lighting and power required for the trailer. Contractor shall make adequate provisions for heating and cooling as required.

1.03 CONSTRUCTION AIDS:

- A. Plant and Equipment:
 - (1) Contractor shall furnish, operate, and maintain a complete plant for fabricating, handling, conveying, installing, and erecting materials and equipment; and for conveyances for transporting workers. Include elevators, hoists, debris chutes, and other equipment, tools, and appliances necessary for performance of the Work.
 - (2) Contractor shall maintain plant and equipment in safe and efficient operating condition. Damages due to defective plant and equipment, and uses made thereof, shall be repaired by Contractor at no expense to the District.
- B. None of the District's tools and equipment shall be used by Contractor for the performance of the Work.

1.04 BARRIERS AND ENCLOSURES:

- A. Contractor shall obtain the District's written permission for locations and types of temporary barriers and enclosures, including fire-rated materials proposed for use, prior to their installation.
- B. Contractor shall provide and maintain temporary enclosures to prevent public entry and to protect persons using other buildings and portions of the Site and/or Premises, the public, and workers. Contractor shall also protect the Work and existing facilities from the elements, and adjacent construction and improvements, persons, and trees and plants from damage and injury from demolition and construction operations.
- C. Contractor shall provide site access to existing facilities for persons using other buildings and portions of the Site, the public, and for deliveries and other services and activities.
- D. Tree and Plant Protection:
 - (1) Contractor shall preserve and protect existing trees and plants on the Premises that are not designated or required to be removed, and those adjacent to the Premises.
 - (2) Contractor shall provide barriers to a minimum height of 4'-0" around drip line of each tree and plant, around each group of trees and plants, as applicable, in the proximity of demolition and construction operations, or as denoted on the Plans.
 - (3) Contractor shall not park trucks, store materials, perform Work or cross over landscaped areas. Contractor shall not dispose of paint thinners, water from cleaning, plastering or concrete operations, or other deleterious materials in landscaped areas, storm drain systems, or sewers. Plant materials damaged as a result of the performance of the Work shall, at the option of the District and at Contractor's expense, either be replaced with new plant materials equal in size to

those damaged or by payment of an amount representing the value of the damaged materials as determined by the District.

- (4) Contractor shall remove soil that has been contaminated during the performance of the Work by oil, solvents, and other materials which could be harmful to trees and plants, and replace with good soil, at Contractor's expense.
- (5) Excavation around Trees:
 - (a) Excavation within drip lines of trees shall be done only where absolutely necessary and with written permission from the District.
 - (b) Where trenching for utilities is required within drip lines, tunneling under and around roots shall be by hand digging and shall be approved by the District. Main lateral roots and taproots shall not be cut. All roots 2 inches in diameter and larger shall be tunneled under and heavily wrapped with wet burlap so as to prevent scarring or excessive drying. Smaller roots that interfere with installation of new work may be cut with prior approval by the District. Roots must first be cut with a Vermeer, or equivalent, root cutter prior to any trenching.
 - (c) Where excavation for new construction is required within drip line of trees, hand excavation shall be employed to minimize damage to root system. Roots shall be relocated in backfill areas wherever possible. If encountered immediately adjacent to location of new construction, roots shall be cut approximately 6 inches back from new construction.
 - (d) Approved excavations shall be carefully backfilled with the excavated materials approved for backfilling. Backfill shall conform to adjacent grades without dips, sunken areas, humps, or other surface irregularities. Do not use mechanical equipment to compact backfill. Tamp carefully using hand tools, refilling and tamping until Final Acceptance as necessary to offset settlement.
 - (e) Exposed roots shall not be allowed to dry out before permanent backfill is placed. Temporary earth cover shall be provided, or roots shall be wrapped with four layers of wet, untreated burlap and temporarily supported and protected from damage until permanently relocated and covered with backfill.
 - (f) Accidentally broken roots should be sawed cleanly 3 inches behind ragged end.

1.05 SECURITY:

The Contractor shall be responsible for project security for materials, tools, equipment, supplies, and completed and partially completed Work.

1.06 TEMPORARY CONTROLS:

A. Noise Control:

- (1) Contractor acknowledges that adjacent facilities may remain in operation during all or a portion of the Work period, and it shall take all reasonable precautions to minimize noise as required by applicable laws and the Contract Documents.
- (2) Notice of proposed noisy operations, including without limitation, operation of pneumatic demolition tools, concrete saws, and other equipment, shall be submitted to the District a minimum of forty-eight (48) hours in advance of their performance.

B. Noise and Vibration:

- (1) Equipment and impact tools shall have intake and exhaust mufflers.
- (2) Contractor shall cooperate with District to minimize and/or cease the use of noisy and vibratory equipment if that equipment becomes objectionable by its longevity.

C. Dust and Dirt:

- (1) Contractor shall conduct demolition and construction operations to minimize the generation of dust and dirt, and prevent dust and dirt from interfering with the progress of the Work and from accumulating in the Work and adjacent areas including, without limitation, occupied facilities.
- (2) Contractor shall periodically water exterior demolition and construction areas to minimize the generation of dust and dirt.
- (3) Contractor shall ensure that all hauling equipment and trucks carrying loads of soil and debris shall have their loads sprayed with water or covered with tarpaulins, and as otherwise required by local and state ordinance.
- (4) Contractor shall prevent dust and dirt from accumulating on walks, roadways, parking areas, and planting, and from washing into sewer and storm drain lines.

D. Water:

- (1) Contractor shall not permit surface and subsurface water, and other liquids, to accumulate in or about the vicinity of the Premises. Should accumulation develop, Contractor shall control the water or other liquid, and suitably dispose of it by means of temporary pumps, piping, drainage lines, troughs, ditches, dams, or other methods.

E. Pollution:

- (1) No burning of refuse, debris, or other materials shall be permitted on or in the vicinity of the Premises.
- (2) Contractor shall comply with applicable regulatory requirements and anti-pollution ordinances during the conduct of the Work including, without limitation, demolition, construction, and disposal operations.

F. Lighting:

- (1) If portable lights are used after dark, all light must be located so as not to direct light into neighboring property.

1.07 PUBLICITY RELEASES:

- A. Contractor shall not release any information, story, photograph, plan, or drawing relating information about the Project to anyone, including press and other public communications medium, including, without limitation, on website(s) without the written permission of the District.

PART 2 – PRODUCTS Not used.

PART 3 – EXECUTION Not used.

END OF DOCUMENT

CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions;
- B. Special Conditions; and
- C. Temporary Facilities and Controls.

1.02 SECTION INCLUDES:

- A. Administrative and procedural requirements for the following:
 - (1) Salvaging non-hazardous construction waste.
 - (2) Recycling non-hazardous construction waste.
 - (3) Disposing of non-hazardous construction waste.

1.03 DEFINITIONS:

- A. Construction Waste: Building and site improvement materials and other solid waste resulting from construction, remodeling, renovation, or repair operations. Construction waste includes packaging.
- B. Demolition Waste: Building and site improvement materials resulting from demolition or selective demolition operations.
- C. Disposal: Removal off-site of demolition and construction waste and subsequent sale, recycling, reuse, or deposit in landfill or incinerator acceptable to authorities having jurisdiction.
- D. Recycle: Recovery of demolition or construction waste for subsequent processing in preparation for reuse.
- E. Salvage: Recovery of demolition or construction waste and subsequent sale or reuse in another facility.
- F. Salvage and Reuse: Recovery of demolition or construction waste and subsequent incorporation into the Work.

1.04 PERFORMANCE REQUIREMENTS:

- A. General: Develop waste management plan that results in end-of Project rates for salvage/recycling of sixty-five percent (65%) by weight (or by volume, but not a combination) of total waste generated by the Work.

1.05 SUBMITTALS:

- A. Waste Management Plan: Submit waste management plan within 30 days of date established for commencement of the Work.
- B. Waste Reduction Progress Reports: Concurrent with each Application for Payment, submit copies of report. Include the following information:
 - (1) Material category.
 - (2) Generation point of waste.
 - (3) Total quantity of waste in tons or cubic yards.
 - (4) Quantity of waste salvaged, both estimated and actual in tons or cubic yards.
 - (5) Quantity of waste recycled, both estimated and actual in tons or cubic yards.
 - (6) Total quantity of waste recovered (salvaged plus recycled) in tons or cubic yards.
 - (7) Total quantity of waste recovered (salvaged plus recycled) as a percentage of total waste.
- C. Waste Reduction Calculations: Before request for final payment, submit copies of calculated end-of-Project rates for salvage, recycling, and disposal as a percentage of total waste generated by the Work.
- D. Records of Donations: Indicate receipt and acceptance of salvageable waste donated to individuals and organizations. Indicate whether organization is tax exempt.
- E. Records of Sales: Indicate receipt and acceptance of salvageable waste sold to individuals and organizations. Indicate whether organization is tax exempt.
- F. Recycling and Processing Facility Records: Indicate receipt and acceptance of recyclable waste by recycling and processing facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.
- G. Landfill and Incinerator Disposal Records: Indicate receipt and acceptance of waste by landfills and incinerator facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.

- H. Qualification Data: For Waste Management Coordinator.
- I. Submittal procedures and quantities are specified in Document 01 33 00.

1.06 QUALITY ASSURANCE:

- A. Waste Management Coordinator Qualifications: LEED Accredited Professional by U.S. Green Building Council.
- B. Regulatory Requirements: Comply with hauling and disposal regulations of authorities having jurisdiction.
- C. Waste Management Conference: Conduct conference at Project site to comply with requirements. Review methods and procedures related to waste management including, but not limited to, the following:
 - (1) Review and discuss waste management plan including responsibilities of Waste Management Coordinator.
 - (2) Review requirements for documenting quantities of each type of waste and its disposition.
 - (3) Review and finalize procedures for materials separation and verify availability of containers and bins needed to avoid delays.
 - (4) Review procedures for periodic waste collection and transportation to recycling and disposal facilities.
 - (5) Review waste management requirements for each trade.

1.07 WASTE MANAGEMENT PLAN:

- A. General: Develop plan consisting of waste identification, waste reduction work plan, and cost/revenue analysis. Indicate quantities by weight or volume, but use same units of measurement throughout waste management plan.
- B. Waste Identification: Indicate anticipated types and quantities of site-clearing and construction waste generated by the Work. Include estimated quantities and assumptions for estimates.
- C. Waste Reduction Work Plan: List each type of waste and whether it will be salvaged, recycled, or disposed of in landfill or incinerator. Include points of waste generation, total quantity of each type of waste, quantity for each means of recovery, and handling and transportation procedures.
 - (1) Salvaged Materials for Reuse: For materials that will be salvaged and reused in this Project, describe methods for preparing salvaged materials before incorporation into the Work.

- (2) Salvaged Materials for Sale: For materials that will be sold to individuals and organizations, include list of their names, addresses, and telephone numbers.
- (3) Salvaged Materials for Donation: For materials that will be donated to individuals and organizations, include list of their names, addresses, and telephone numbers.
- (4) Recycled Materials: Include list of local receivers and processors and type of recycled materials each will accept. Include names, addresses, and telephone numbers.
- (5) Disposed Materials: Indicate how and where materials will be disposed of. Include name, address, and telephone number of each landfill and incinerator facility.
- (6) Handling and Transportation Procedures: Include method that will be used for separating recyclable waste including sizes of containers, container labeling, and designated location on Project site where materials separation will be located.

PART 2 - PRODUCTS Not Used.

PART 3 - EXECUTION

3.01 PLAN IMPLEMENTATION:

- A. General: Implement approved waste management plan. Provide handling, containers, storage, signage, transportation, and other items as required to implement waste management plan during the entire duration of the Contract.
 - (1) Comply with Document 01 50 00 for operation, termination, and removal requirements.
- B. Training: Train workers, subcontractors, and suppliers on proper waste management procedures, as appropriate for the Work occurring at Project site.
 - (1) Distribute waste management plan to everyone concerned within 3 days of submittal return.
 - (2) Distribute waste management plan to entities when they first begin work on site. Review plan procedures and locations established for salvage, recycling, and disposal.
- C. Site Access and Temporary Controls: Conduct waste management operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.

- (1) Designate and label specific areas of Project site necessary for separating materials that are to be salvaged, recycled, reused, donated, and sold.
- (2) Comply with Document 01 50 00 for controlling dust and dirt, environmental protection, and noise control.

3.02 RECYCLING CONSTRUCTION WASTE:

- A. General: Recycle paper and beverage containers used by on-site workers.
- B. Recycling Incentives: Revenues, savings, rebates, tax credits, and other incentives received for recycling waste materials shall accrue to the Contractor.
- C. Procedures: Separate recyclable waste from other waste materials, trash, and debris. Separate recyclable waste by type at Project site to the maximum extent practical.
 - (1) Provide appropriately marked containers or bins for controlling recyclable waste until they are removed from Project Site. Include list of acceptable and unacceptable materials at each container and bin.
 - (a) Inspect containers and bins for contamination and remove contaminated materials if found.
 - (2) Stockpile processed materials on site without intermixing with other materials. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
 - (3) Stockpile materials away from construction area. Do not store within drip line of remaining trees.
 - (4) Store components off the ground and protect from the weather.
 - (5) Remove recyclable waste off District property and transport to recycling receiver or processor.
- D. Packaging:
 - (1) Cardboard and Boxes: Break down packaging into flat sheets. Bundle and store in a dry location.
 - (2) Polystyrene Packaging: Separate and bag material.
 - (3) Pallets: As much as possible, require deliveries using pallets to remove pallets from Project Site. For pallets that remain on Site, break down pallets into component wood pieces and comply with requirements for recycling wood.
 - (4) Crates: Break down crates into component wood pieces and comply with requirements for recycling wood.

- E. Site-Clearing Wastes: Chip brush, branches, and trees on site.
- F. Wood Materials:
 - (1) Clean Cut-Offs of Lumber: Grind or chip into small pieces.
 - (2) Clean Sawdust: Bag sawdust that does not contain painted or treated wood.

3.03 DISPOSAL OF WASTE:

- A. General: Except for items or materials to be salvaged, recycled, or otherwise reused, remove waste materials from Project Site and legally dispose of them in a landfill or incinerator acceptable to authorities having jurisdiction.
 - (1) Except as otherwise specified, do not allow waste materials that are to be disposed of accumulate on site.
 - (2) Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
- B. Burning: Do not burn waste materials.
- C. Disposal: Transport waste materials off District property and legally dispose of them.

END OF DOCUMENT

FIELD OFFICES

PART 1 – GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions;
- B. Special Conditions; and
- C. Temporary Facilities and Controls.

1.02 SECTION INCLUDES:

- A. Requirements for Field Offices and Field Office Trailers.

1.03 SUMMARY:

- A. General: Contractor shall provide District's Field Office Trailer and contents, for District's use exclusively, during the term of the Contract.
- B. Property: Trailer, furniture, furnishings, equipment, and the like, supplied by the Contractor with the Office Trailer shall remain the property of the Contractor; District property items installed, delivered, and the like by District within the Office Trailer will remain District's property.
- C. Modifications: District reserves the right to modify the trailer or contents, or both, as may be deemed proper by District.
- D. Condition: Trailer and contents shall be clean, neat, substantially finished, in good, proper, and safe condition for use, operation, and the like; the trailer and contents shall not be required to be new.
- E. Installation Timing: Provide safe, fully furnished, functional, proper, complete, and finished trailer properly ready for entire use, within fourteen (14) calendar days of District's notification of the issuance of Notice to Proceed.

1.04 SUBMITTALS:

- A. General: Submit submittals to District in quantity, format, type, and the like, as specified herein.
- B. Office Trailer Data: One (1) copy of manufacturer's descriptive data, technical descriptions, regulatory compliance, industry standards, installation, removal, and maintenance instructions.

- C. Equipment Data: Two (2) copies of manufacturer data for each type of equipment, if directed by District.
- D. Furniture and Furnishings Data: Two (2) copies of manufacturer data for each type of equipment, if directed by District.
- E. Plans: One (1) reproducible copy of appropriately scaled plans of trailer layout. Plans shall include, but not be limited to: lighting; furniture; equipment; telephone and electrical outlets; and the like.
- F. Product Samples: One (1) complete and entire unit of each type, if directed by District.

1.05 QUALITY ASSURANCE

- A. Standards: In the event that provisions of codes, regulations, safety orders, Contract Documents, referenced manufacturer's specifications, manufacturer's instructions, industry standards, and the like, are in conflict, the more restrictive and higher quality shall govern.
- B. Installer: Installer or Installers engaged by Contractor must have a minimum of five (5) years of documented and properly authenticated successful experience of specialization in the installation of the items or systems, or both, specified herein.
- C. Manufacturer: Contractor shall obtain products from nationally and industry recognized Manufacturer with five (5) years minimum, of immediately recent, continuous, documented and properly authenticated successful experience of specialization in the manufacture of the product specified herein.
- D. State Personnel Training: Provide proper training for maintenance and operations, including emergency procedures, and the like, as directed by District.
- E. Units: Shall be sound and free of defects, and shall not include any damage or defect that will impair the safety, installation, performance, or the durability of the entire Office Trailer and appurtenant systems.

1.06 REGULATORY REQUIREMENTS

- A. General: Work shall be executed in accordance with applicable Codes, Regulations, Statutes, Enactments, Rulings, Laws, each authority having jurisdiction, and including, but not limited to, Regulatory Requirements specified herein.
- B. California Building Standards Code ("CBSC").
- C. California Code of Regulations, Title 25, Chapter 3, Sub Chapter 2, Article 3 ("CCR").
- D. Coach Insignia: Trailer shall display California Commercial Coach Insignia; such insignia shall be deemed to show that the trailer is in accordance with the Construction and Fire Safety requirements of CCR.

PART 2 – PRODUCTS

2.01 FIELD OFFICE TRAILER

- A. General: Provide entire Field Office Trailer of type, function, operation, capacity, size, complete with controls, safety devices, accessories, and the like, for proper and durable installation. Partitions, walls, ceiling, and other interior and exterior surfaces shall be appropriately finished, including, but not limited to, trim, painting, wall base, floor covering, suspended or similar ceiling, and the like; provide systems, components, units, nuts, bolts, screws, anchoring devices, fastening devices, washers, accessories, adhesives, sealants, and other items of type, grade, and class required for the particular use, not identified but required for a complete, weather-tight, appropriately operating, and finished installation.
- B. Manufacturers: General Electric Capital Modular Space; The Space Place, Inc.; or equal.
- C. Program: Provide a wheel-mounted trailer with stairs, landings, platforms, ramps, and the like, in good, proper, safe, clean, and properly finished condition; with proper heavy duty locks, and other proper and effective security at all doors, windows, and the like. Trailer shall be maintained in good, proper, safe, clean, and properly finished condition during the Contract.
 - (1) Nominal Trailer Size: Four hundred eighty (480) square feet, minimum.
 - (2) Stairs, Platform: Properly finished stairs, platforms, and ramps.
 - (3) Doors: Two (2), three (3) foot wide exterior doors with locksets; finished ramp, steps, and entry platform at each exterior door.
 - (4) Keys: Submit five (5) keys for each door, window, furniture unit, and the like. There shall be no other key copies or originals available; each key shall be identified for District; and shall be labeled, or tagged
 - (5) Lighting: Sixty-five (65) foot-candles illumination minimum at any point, at thirty (30) inches above finished floor throughout from fluorescent light source, exclusively, or as directed by District.
 - (6) Electrical Outlets: One (1) duplex outlet evenly spaced every twelve (12) linear horizontal feet of wall face, and electrical service ready for use.

2.02 FIELD OFFICE TRAILER ITEMS

- A. General: Provide the Field Office Trailer with the following arranged into two (2) workstations:
 - (1) Desks: Two (2) desks: thirty-six (36) inches by sixty (60) inches; steel, laminated plastic top; locking, one (1) or two (2) file drawers single pedestal; steel; provide five (5) keys to District.

- (2) Tables: Two (2) tables; thirty-six (36) inches by sixty (60) inches; twenty-nine (29) inches high; steel, laminated plastic top tables; one (1) at each desk.
 - (3) Chairs: Two (2) chairs: swivel; steel; with seat cushion and arms; one (1) at each desk.
 - (4) Waste Baskets: Two (2) waste baskets, one at each desk.
- B. Furniture and Equipment: Provide in the space located to effect efficient and logical use.
- (1) File cabinet: One (1); four (4) drawer; lateral; steel locking.
 - (2) Plan Table: One (1) plan table: thirty-six (36) inches deep by seventy-two (72) inches wide by forty-two (42) inches high; adjustable; wood or steel; with lockable plan and pencil drawers.
 - (3) Drafting Stool: One (1) drafting stool; swiveling; steel; padded; adjustable; with footrest and casters.
 - (4) Bookshelf: One (1) bookshelf: thirty-six (36) inches deep by seventy-two (72) inches wide by forty-two (42) inches high; adjustable; wood or steel; with lockable plan and pencil drawer.
 - (5) Plan Rack: One (1) wheel mounted plan rack.
 - (6) Waste Baskets: One (1) large waste basket.
 - (7) Coat/Hat Hanger: Wall mounted with minimum capacity for four (4) garments and ten (10) hats.
 - (8) Document Management System: Shall include an integrated high-volume printer, copier, and facsimile machine, including stand, base, and storage cabinet; and shall include the following features:
 - (a) Type: Laser, dry electrostatic transfer, plain paper, digital, multi-function imaging system.
 - (b) Network: Ethernet or Token Ring network ready, Plug-and-Play.
 - (c) Print, send/receive facsimile from any connected workstation.
 - (d) Resolution: Six hundred (600) dots per inch by six hundred (600) dots per inch, minimum.
 - (e) Print Speed: Twenty (20) pages per minute, minimum.
 - (f) Copies: Twenty (20) copies per minute, minimum.
 - (g) Document Handler: Forty (40) sheet, minimum

- (h) Collator: Forty (40) bin, minimum, with stapling.
- (i) Duplexing: Capable.
- (j) Paper Size: Capable of handling paper sizes to eleven (11) inches by seventeen (17) inches.
- (k) Paper Cassettes: One (1) each for eight and one half (8.5) inches by eleven (11) inches, eight and one half (8.5) inches by fourteen (14) inches, and eleven (11) inches by seventeen (17) inches paper sizes; minimum two hundred fifty (250) sheets per cassette.
- (l) Reduction/Enlargement: Capable of reduction to twenty-five percent (25%) and enlargement to two hundred percent (200%).
- (m) Facsimile Electronic Storage: Capable of storing minimum of fifty (50) speed dial numbers, group faxing and broadcast faxing.
- (n) Facsimile Scanning: Capable of scanning into memory a minimum of one hundred (100) pages with maximum scan time of three (3) seconds per page.
- (o) Halftone: Sixty-four (64) levels.
- (p) Redial: Automatic and Manual.
- (9) Maintenance: Contractor shall purchase service agreements for each unit of equipment for the duration of the project plus two (2) months, and shall maintain all equipment in proper working condition. Service agreements shall include provision for replacement of toner cartridges and other items required to effect proper unit use. Service agreements shall also provide for:
 - (a) Unlimited Service Calls.
 - (b) Same Day Response.
 - (c) All parts, labor, preventative maintenance and mileage.
 - (d) All chemicals, such as toner, fixing agent, and the like.
 - (e) System training and setup.
- (10) Portable Toilets: Two (2); each shall include a urinal; each unit shall be a properly enclosed chemical unit conforming to ANSI Z4.3.
 - (a) Location: As directed by District.
 - (b) Maintenance: Maintain each unit and surrounding areas in a clean, hygienic and orderly manner, at all time. Empty, clean,

and sanitize each unit each day at a location and time as directed by District.

- (c) Removal: Relocate, or remove from the site, each Portable Toilet. Upon such directive by District, the Contractor shall forthwith relocate or remove each Portable Toilet and submit the affected areas to a condition which existed prior to the installation of each Portable Toilet, within three (3) calendar days, or as directed by District in writing, at no cost to District.

2.03 UTILITY AND SERVICES

- A. Telephone Service: Contractor shall provide and interface the entire telephone service, and shall properly and timely pay for telephone service for District's non-long-distance use.
- B. Electrical Service: Provide all proper connections and continuously pay for service for the duration of the Work.

2.04 FINISHES

- A. General: Manufacturer standard finish system over surfaces properly cleaned, pretreated, and prepared to obtain proper bond; all visible surfaces shall be coated.
- B. Finish: Color as selected by District from manufacturer standard palette.

PART 3 – EXECUTION

3.01 INSTALLATION

- A. General: Properly prepare area and affected items to receive the Work. Set Work accurately in location, alignment, and elevation; rigidly, securely, and firmly anchor to appropriate structure; install plumb, straight, square, level, true, without racking, rigidly anchored to proper solid blocking, substrate, and the like; provide appropriate type and quantity of reinforcements, fasteners, adhesives, self-adhesive and other tapes; lubricants, coatings, accessories, and the like, as required for a complete, structurally rigid, stable, sound, and appropriately finished installation, in accordance with manufacturer's published instructions, and as indicated. The more restrictive and higher quality requirement shall govern. Moving parts shall be properly secured, without binding, looseness, noise, and the like.
- B. Installation: Install in accordance with 25 CCR 3.2.3 and as directed by District; jack up trailer and level both ways; mount on proper concrete piers with all load off wheels; provide required tie down and accessories per Section 4368 of referenced CCR, and as directed by District.
- C. Rejected Work: Work, materials, unit, items, systems, and the like, not accepted by District shall be deemed rejected, and shall forthwith be removed and replaced with proper and new Work, materials, unit, items, systems, and the like at no cost to District.

- D. Standard: Comply with manufacturer's published instructions, or with instructions as shown or indicated; the more restrictive and higher quality requirement shall govern.
- E. Location: As directed by District.
- F. Fire Resistance: Construct and install in accordance with UL requirements.
- G. Maintenance: Contractor shall maintain trailer and adjacent areas in a safe, clean and hygienic condition throughout the duration of the Work, and as directed by District. Properly repair or replace furniture or other items, as directed by District. Properly remove unsafe, damaged, or broken furniture, or similar items, and replace with safe and proper items. Contractor shall pay cost of all services, repair, and maintenance, or replacement of each item.
- H. Janitorial Service: Provide professional janitorial services, including, but not limited to, trash, waste paper baskets, fill paper dispensers; clean and dust all furniture, files, and the like; sweep and mop resilient and similar flooring; and vacuum carpeting and similar flooring.
 - (1) Frequency: Two (2) times per week, minimum.
- I. Removal: Properly remove the Office Trailer and contents from the Site upon completion of the Contract, or as directed by District in writing. Forthwith properly patch and repair affected areas; replace damaged items with new items. Carefully and properly inventory, clean, pack, store, and protect District property; submit District property to District at a date, time and location as directed by District.

END OF DOCUMENT

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Protection for existing trees.
 - 2. Repair and replacement of damaged trees.

1.2 RELATED REQUIREMENTS

- A. Section 32 8000, Irrigation.
- B. Section 32 9000, Landscaping.

1.3 REFERENCES AND STANDARDS

- A. American National Standard Institute (ANSI) A300 Pruning Standards.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Submittal Procedures:
 - 1. Action Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
 - 2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.

1.5 ACTION SUBMITTALS

- A. Fenced Tree Protection Area Plan: Submit plan outlining trees listed by number to be protected and their groupings. Trees shall be grouped in their own Fenced Tree Protection Areas as shown in Drawings.
- B. Schedule of Activities Inside Tree Protection Area: Submit in writing a schedule, including any and all activity inside Fenced Tree Protection Areas. This schedule to include but not limited to the dates fences are initially installed, altered and dates of fence replacement. Intent of these provisions is that the Tree Protection Zones (TPZ) are fenced for the entire duration with only exceptions of short intervals or specifically defined construction activity needs. Revise schedule as directed.
- C. Mediation Plan: Submit mediation plan to keep existing trees and planting irrigated during construction.

1.6 CLOSEOUT SUBMITTALS

- A. Maintenance Plan: For replaced trees.

TEMPORARY TREE PROTECTION
SECTION 01 5639
3595001

PART 2 - PRODUCTS

2.1 GENERAL

- A. Use materials as specified; any deviation from the Specifications must first be approved by the Owner's Representative in writing.

2.2 MATERIALS

- A. Trunk Protection constructed of:
 - 1. 20-foot long 2x6 wood boards or length needed to protect the trunk if tree trunk is shorter than 20 feet in height.
 - 2. Metal wire. Gauge strong enough to tie the boards around the trunk of the tree.
- B. Tree Protection Zone Fencing:
 - 1. 6-foot-tall metal chain link construction fencing.
- C. Bark Mulch: Untreated, shredded cedar.

PART 3 - EXECUTION

3.1 GENERAL REQUIREMENTS FOR TREES BE RETAINED

- A. Maintain pre-existing moisture levels.
- B. Maintain areas inside the fenced tree protection area including lawn mowing, leaf removal, operation and repair of irrigation.
- C. Protect root systems from flooding, erosion, excessive watering and drying resulting from dewatering or other operations:
- D. Operations not Allowed:
 - 1. Run off or spillage of damaging materials in vicinity of root systems.
 - 2. Rinsing of tools or equipment under trees.
 - 3. Storage of materials, stockpile soil, park or drive vehicles within drip lines.
 - 4. Cutting, breaking skin or bark, or bruising roots or branches.
 - 5. Fires under and adjacent trees.
 - 6. Discharge exhaust under foliage.
 - 7. Securing cable, chain, or rope to trees.
 - 8. Change of grade within drip line of trees without Landscape Architect's approval.
 - 9. The use of lime.

3.2 TREE TRUNK PROTECTION

- A. Conform to requirements for trees to be retained, in accordance with article GENERAL REQUIREMENTS FOR TREES TO BE RETAINED.
- B. Install boards vertically around tree and bind together with wire to protect the bark 360 degrees around the entire tree prior to start of any demolition and construction. Boards are not to dig into bark.
- C. Major scaffold limbs may require plastic fencing to be wrapped around them for protection.

3.3 TREE DRIPLINE PROTECTION

- A. The Tree Protection Zone (TPZ) is a restricted area around the base of the tree with a radius of one foot (1') for every inch of tree trunk diameter or ten feet, which ever is greater, enclosed by 6' tall chain link fence unless otherwise directed.
- B. Signage designating the protection zone and penalties for violations shall be secured in prominent location on each protection fence.

3.4 TREE PROTECTION

- A. Duration: Tree protection shall be erected before demolition, grading, or any construction begins and remain in place until final inspection of the project.
- B. Conform to requirements for trees and plants to be retained, in accordance with article GENERAL REQUIREMENTS FOR TREES TO BE RETAINED.
- C. Construction shall not commence until approval of the Fenced Tree Protection Area Plan and Schedule of Activities Inside Tree Protection Area have been obtained from the Architect.
- D. Vehicle movement within the TPZ will only be allowed for construction equipment.
 - 1. Within dripline, apply 10-inch layer of mulch over geotextile fabric.
- E. Perform trenching operations within the TPZ of the tree so that:
 - 1. Digging shall be by hand using narrow trenching shovel.
 - 2. No roots larger than 2" diameter are cut and utilities are routed around or below them.
 - 3. Roots smaller than 2" diameter are cut with sharp tools, saws, loppers; not torn, chopped or broken.
- F. Where roots are exposed:
 - 1. Do not allow the roots to dry out.
 - 2. On the same day the excavation is made, provide temporary backfill to original grade at tree roots,

TEMPORARY TREE PROTECTION
SECTION 01 5639
3595001

- 3. Or cover roots with 4 layers of wet untreated burlap, made wet each day, including weekends.
- G. Roots larger than 3" in diameter are not to be cut without review and approval by an Arborist provided by Owner.

3.5 REPAIR AND REPLACEMENT OF TREES

- A. Repair or replace damaged trees as required or directed.
- B. Repair trees damaged by operations:
 - 1. within 24 hours of damage,
 - 2. to satisfaction of Landscape Architect,
 - 3. to ANSI A300 Pruning Standards.
- C. Replace repaired trees where repair has not restored them to health or aesthetics:
 - 1. within 6 months of request to replace,
 - 2. to the satisfaction of Landscape Architect,
 - 3. with replacement trees of a size and variety matching those that were removed,
- D. Replaced trees shall be maintained in good health and aesthetics for the duration of the project from installation.
 - 1. Submit comprehensive maintenance plan for replacement trees, including but not limited to provisions for irrigation system independent of existing system.
- E. Where suitable replacement of trees is not available:
 - 1. Submit affidavit to Landscape Architect that they are not available.
 - 2. Provide compensation to Owner at the following rates:
 - a. \$2000 for each caliper inch of tree removed under 12 inches.
 - b. \$4000 for each caliper inch of tree removed 12 inches or greater.
 - c. Caliper of trees measured at 6 inches above grade.
 - d. Caliper defined here as thickness of diameter, measured in inches.

3.6 SOIL CONTAMINATION

- A. Remove soil that has been contaminated during the performance of the Work by oil, solvents, and other materials which could be harmful to trees and plants.

TEMPORARY TREE PROTECTION
SECTION 01 5639
3595001

1. Replace with good soil in conformance with Section 31 0000, Earthwork, at Contractor's expense.

END OF SECTION

*p:\sacramento\3595 tracy unified school district\001-000_villalovoz es new shade structures\08 specifications\06 spec\04 final\freiler
- shade struct\01 5639_temporary tree protection.docx
New File: January 6, 2022*

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Requirements for preparing Storm Water Pollution Prevention Plan.

1.2 SCOPE OF WORK

A. General: Provide all materials, equipment and labor necessary to furnish and install straw wattles or silt fence barriers at locations shown on the Drawings and as required during construction.

B. The Contractor shall as a minimum address:

1. Cut and fill operations.
2. Temporary stockpiles.
3. Vehicle and equipment storage, maintenance and fueling operations.
4. Concrete, plaster, mortar and paint disposal.
5. Dust control.
6. Tracking of dirt, mud on off-site streets.
7. Pipe flushing.

1.3 ADMINISTRATIVE REQUIREMENTS

A. Submittal Procedures:

B. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures

1.4 QUALITY ASSURANCE

A. General: Comply with governing codes and regulations.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Straw Wattles: New manufactured straw roles in compliance with state requirements for sediment control.

B. Silt Fences: New manufactured silt fence in compliance with state requirements for sediment control.

C. Filter Bag: As required by local jurisdiction.

**EROSION CONTROL
SECTION 01 5713.10
3595001**

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Straw Wattles: Install per the drawings and/or as required.
- B. Silt Fences: Install per the Drawings and/or as required. Silt Fences shall not be used around inlets.
- C. Filter Bags: Installed as required by manufacturer's requirements.

3.2 MAINTENANCE AND REMOVAL:

- A. General: Maintain and repair existing and new erosion control facilities throughout the construction period. Remove silt build up at straw wattles and/or silt fences as needed. Repair damage to earth slopes and banks. Erosion control measures shall be left in place until final paving and landscaping are complete.
- B. Monitoring: Provide monitoring of erosion control measures before and after storm events.
- C. Cleaning: Keep area clean of debris.
- D. Remove erosion control measures prior to placing finish landscaping.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: VOC restrictions for product categories listed below under Article "DEFINITIONS" and in compliance with the following.
 - 1. California Code of Regulations, Title 24, Part 11 California Green Building Standards Code.
 - 2. Local Agency Division of the State Architect.
 - 3. No Rating System is applicable.
- B. Products of each category that are installed in the project must comply; applicable laws and ordinances do not allow for partial compliance.
- C. Listing of a product in these Specifications shall not be construed as a solicitation or requirement to use any product or combination of products in violation of the requirements of South Coast Air Quality Management District Rule No.1168, as described in Rule 1168(g).
 - 1. If a listed product does not meet the requirements of this rule, request approval for use of an alternate product by the same or another manufacturer meeting the requirements of this rule.
 - 2. Do not use products which do not meet the requirements of this rule.

1.2 RELATED REQUIREMENTS

- A. Divisions 01 through 33 contain related requirements specific to the work of each of these Sections. Requirements may or may not include reference to this Section.
- B. Section 01 8113, Sustainable Design Requirements, for CAL-Green general requirements and procedures.

1.3 REFERENCES

- A. California Green Building Standards Code (CALGreen), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. Low-Emitting Materials Product List; California Collaborative for High Performance Schools (CHPS); current edition at www.chps.net/.
- C. CRI (GLCC) - Green Label Testing Program - Approved Product Categories for Carpet Cushion; Carpet and Rug Institute; current edition.
- D. CRI (GLP) - Green Label Plus Carpet Testing Program - Approved Products; Carpet and Rug Institute; current edition.
- E. GEI (SCH) - GREENGUARD "Children and Schools" Certified Products; GREENGUARD Environmental Institute; current listings at www.greenguard.org.

VOLATILE ORGANIC COMPOUND (VOC) RESTRICTIONS

SECTION 01 6116.10

3595001

- F. GreenSeal GS-36 - Commercial Adhesives; Green Seal, Inc.
- G. SCAQMD 1168 - South Coast Air Quality Management District Rule No.1168; current edition; www.aqmd.gov.
- H. SCS (CPD) - SCS Certified Products; Scientific Certification Systems; current listings at www.scs-certified.com.

1.4 DEFINITIONS

- A. VOC-Restricted Products: Products of each of the following categories when installed or applied on-site:
 - 1. Adhesives, sealants, and sealer coatings, regardless of specification Section or Division.
 - 2. Paints and coatings.
 - 3. Carpet and resilient flooring.
 - 4. Composite wood products; plywood, particleboard, wood fiberboard.
- B. Adhesives: Gunnable, trowelable, liquid-applied, and aerosol adhesives, whether specified or not; including flooring adhesives, resilient base adhesives, and pipe jointing adhesives.
- C. Sealants: Gunnable, trowelable, and liquid-applied joint sealants and sealant primers, whether specified or not; including firestopping sealants and duct joint sealers.

1.5 SUBMITTAL REQUIREMENTS

- A. Product Data: For each VOC-restricted product used in the project, submit product data showing compliance, except when another type of evidence of compliance is required.
- B. Verification of Compliance: Submit for each different product in each applicable category.
 - 1. Identify evidence submittals with the words "CALGreen VOC Compliance Report".
- C. Installer Certifications for Accessory Materials:
 - 1. Require each installer of any type of product, not just the products for which VOC restrictions are specified, to certify that either 1) no adhesives, joint sealants, paints, coatings, or composite wood or agrifiber products have been used in the installation of their products, or 2) that such products used comply with these requirements.
 - 2. Use the form following at the end of Part 3 in this Section for Installer certifications.

1.6 QUALITY ASSURANCE

- A. Manufacturer's Testing Agency Qualifications: Independent firm specializing in performing testing and inspections of the type specified in this Section.

PART 2 - PRODUCTS

2.1 MATERIALS

A. General:

1. Provide products conforming to local, State and Federal government requirements limiting the amount of volatile organic compounds contained in the product, for its intended application. If specified product exceeds current requirement, provide conforming product at no additional cost.
2. Provide only products having volatile organic compound (VOC) content not greater than required by South Coast Air Quality Management District Rule No.1168 and less where required by code.
3. Products are specified in multiple Sections throughout these Specifications.

B. Adhesives, Including Carpet and Cushion Adhesives: Comply with CALGreen Section 5.504 and Table 5.504.4.1.

1. Verification of Compliance: Acceptable types are:
 - a. Report of laboratory testing performed in accordance with requirements.
 - b. Published product data showing compliance with requirements.
 - c. Certification by manufacturer that product complies with requirements.
2. Aerosol Adhesives: Comply with Table 5.504.4.1 of CalGreen Section 5.504, and California Code of Regulations Title 17, Section 94507.
 - a. Verification of Compliance: Acceptable types are:
 - 1) Current GreenSeal Certification.
 - 2) Report of laboratory testing performed in accordance with GreenSeal GS-36 requirements.
 - 3) Published product data showing compliance with requirements.
3. Products used shall comply with the following limits.

Table 5.504.4.1 ADHESIVE VOC LIMIT	
Architectural Applications	Current VOC Limit
Indoor Carpet Adhesives	50
Carpet Pad Adhesives	50
Outdoor Carpet Adhesives	150
Wood Flooring Adhesive	100
Rubber Floor Adhesives	60
Subfloor Adhesives	50
Ceramic Tile Adhesives	65
VCT and Asphalt Tile Adhesives	50
Dry Wall and Panel Adhesives	50
Cove Base Adhesives	50
Multipurpose Construction Adhesives	70
Structural Glazing Adhesives	100

VOLATILE ORGANIC COMPOUND (VOC) RESTRICTIONS
SECTION 01 6116.10
3595001

Table 5.504.4.1 ADHESIVE VOC LIMIT	
Single Ply Roof Membrane Adhesives	250
Other adhesives not specifically listed	250
VOC Limits and Effective Dates**	
Specialty Applications	Current VOC Limit
PVC Welding	510
CPVC Welding	490
ABS Welding	325
Plastic Cement Welding	250
Adhesive Primer for Plastic	550
Contact Adhesive	80
Special Purpose Contact Adhesive	250
Structural Wood Member Adhesive	140
Top and Trim Adhesive	250
** The specified limits remain in effect unless revised limits are listed in the current governing edition of CalGreen.	
For adhesives, adhesive bonding primers, or any other primer not regulated by the above two Tables and applied to the following substrates, the following limits shall apply:	
Substrate Specific Applications	Current VOC Limit
Metal to Metal	30
Plastic Foams	50
Porous Material (except wood)	50
Wood	30
Fiberglass 80	80
Note: If an adhesive is used to bond dissimilar substrates together the adhesive with the highest VOC content shall be allowed.	

C. Joint Sealants: Comply with CALGreen Section 5.504 and Table 5.504.4.2.

1. Verification of Compliance: Acceptable types are:
 - a. Report of laboratory testing performed in accordance with requirements.
 - b. Published product data showing compliance with requirements.
 - c. Certification by manufacturer that product complies with requirements.
2. Products used shall comply with the following limits.

Table 5.504.4.2 SEALANT VOC LIMIT	
Less Water and Less Exempt Compounds in Grams per Liter	
Sealant	Current VOC Limit
Architectural	250
Marine Deck	760
Non-Membrane Roof	300
Roadway	250
Single-Ply Roof Membrane	450

VOLATILE ORGANIC COMPOUND (VOC) RESTRICTIONS**SECTION 01 6116.10****3595001**

Table 5.504.4.2 SEALANT VOC LIMIT	
Less Water and Less Exempt Compounds in Grams per Liter	
Other	420
Sealant Primers	Current VOC Limit
Architectural	
Non-Porous	250
Porous	775
Modified Bituminous	500
Marine Deck	760
Other	750
For low-solid adhesives or sealants the VOC limit is expressed in grams per liter of material; for all other adhesives and sealants, VOC limits are expressed as grams of VOC per liter of adhesive or sealant less water and less exempt compounds.	

- D. Paints and Coatings: Comply with CALGreen Section 5.504 and Table 5.504.4.3 based on the California Air Resources Board, Architectural Coatings Suggested Control Measure.
1. Determination of VOC Content: Testing and calculation in accordance with 40 CFR 59, Subpart D (EPA Method 24), exclusive of colorants added to a tint base and water added at Project site; or other method acceptable to authorities having jurisdiction.
 - a. Verification of Compliance: Acceptable types are:
 - 1) Report of laboratory testing performed in accordance with requirements.
 - 2) Published product data showing compliance with requirements.
 - 3) Certification by manufacturer that product complies with requirements.
 2. Provide coatings that comply with the most stringent requirements specified in the following:
 - a. 40 CFR 59, Subpart D--National Volatile Organic Compound Emission Standards for Architectural Coatings.
 - b. South Coast Air Quality Management District Rule No.1168.
 3. Aerosol Paints and Coatings: Comply with CALGreen 5.504.4.3.1 and, for projects in the jurisdiction of BAAQMD, comply with VOC by weight of product limits of regulation 8, Rule 49.
 4. Products used shall comply with the following limits.

Table 5.504.4.3 VOC CONTENT LIMITS FOR ARCHITECTURAL COATINGS	
(See Notes 2 & 3 below)	
Grams of VOC per Liter of Coating, less water and less exempt compounds	
Coating Category	Current VOC Limit 1/1/2012
Flat Coatings	50

VOLATILE ORGANIC COMPOUND (VOC) RESTRICTIONS
SECTION 01 6116.10
3595001

Table 5.504.4.3 VOC CONTENT LIMITS FOR ARCHITECTURAL COATINGS (See Notes 2 & 3 below)	
Grams of VOC per Liter of Coating, less water and less exempt compounds	
Coating Category	Current VOC Limit 1/1/2012
Non-Flat Coatings	100
Non-Flat High Gloss Coatings	150
Specialty Coatings	
Aluminum Roof Coatings	400
Basement Specialty Coatings	400
Bituminous Roof Coatings	50
Bituminous Roof Primers	350
Bond Breakers	350
Concrete Curing Compounds	350
Concrete / Masonry Sealers	100
Driveway Sealers	50
Dry Fog Coatings	150
Faux Finishing Coatings	350
Fire Resistive Coatings	350
Floor Coatings	100
Form-Release Compounds	250
Graphic Arts Coatings (Sign Paints)	500
High-Temperature Coatings	420
Industrial Maintenance Coatings	250
Low Solids Coatings (See Note 1 below)	120
Magnesite Cement Coatings	450
Mastic Texture Coatings	100
Metallic Pigmented Coatings	500
Multicolor Coatings	250
Pretreatment Wash Primers	420
Primers, Sealers and Undercoaters	100
Reactive Penetrating Sealers	350
Recycled Coatings	250
Roof Coatings	50
Rust Preventative Coatings	250
Shellacs:	
Clear	730
Opaque	550
Specialty Primers, Sealers and Undercoaters	100
Stains	250
Stone Consolidants	450
Swimming Pool Coatings	340
Traffic Marking Coatings	100
Waterproofing Membranes	250
Wood Coatings	275
Wood Preservatives	350

VOLATILE ORGANIC COMPOUND (VOC) RESTRICTIONS
SECTION 01 6116.10
3595001

Table 5.504.4.3 VOC CONTENT LIMITS FOR ARCHITECTURAL COATINGS (See Notes 2 & 3 below)	
Grams of VOC per Liter of Coating, less water and less exempt compounds	
Coating Category	Current VOC Limit 1/1/2012
Zinc Rich Primers	340
Note 1: Grams of VOC per liter of coating including water and including exempt compounds	
Note 2: Not Applicable	
Note 3: Values in this table are derived from those specified by the California Air Resources Board, Architectural Coatings Suggested Control Measure, February 1, 2008. More information is available from the Air Resources Board.	

5. Restricted Components: In addition to the specified VOC limits, paints and coatings shall not contain any of the following:
- a. Acrolein.
 - b. Acrylonitrile.
 - c. Antimony.
 - d. Benzene.
 - e. Butyl benzyl phthalate.
 - f. Cadmium.
 - g. Di (2-ethylhexyl) phthalate.
 - h. Di-n-butyl phthalate.
 - i. Di-n-octyl phthalate.
 - j. 1,2-dichlorobenzene.
 - k. Diethyl phthalate.
 - l. Dimethyl phthalate.
 - m. Ethylbenzene.
 - n. Formaldehyde.
 - o. Hexavalent chromium.
 - p. Isophorone.
 - q. Lead.
 - r. Mercury.
 - s. Methyl ethyl ketone.
 - t. Methyl isobutyl ketone.
 - u. Methylene chloride.
 - v. Naphthalene.
 - w. Toluene (methylbenzene).
 - x. 1,1,1-trichloroethane.
 - y. Vinyl chloride.

VOLATILE ORGANIC COMPOUND (VOC) RESTRICTIONS
SECTION 01 6116.10
3595001

PART 3 - EXECUTION

3.1 FIELD QUALITY CONTROL

- A. Owner reserves the right to reject non-compliant products, whether installed or not, and require their removal and replacement with compliant products at no extra cost to Owner.
- B. Additional costs to restore indoor air quality, including fines by authorities, due to installation of non-compliant products shall be borne by Contractor.

3.2 CERTIFICATION FORM

- A. Use of this Form:
 - 1. Because installers are allowed and directed to choose accessory materials suitable for the applicable installation, there is a possibility that such accessory materials might contain VOC content in excess of that permitted, especially where such materials have not been explicitly specified.
 - 2. Contractor is required to obtain and submit this Form from each installer of work on this project.
 - 3. For each product category listed, circle the correct words in brackets: either [HAS] or [HAS NOT].
 - 4. If these accessory materials have been used, attach to this form product data and MSDS sheet for each such product.

(The Remainder of this Page is Intentionally Left Blank)

ACCESSORY MATERIAL VOC CONTENT CERTIFICATION FORM

IDENTIFICATION:

Project Name: _____

Project No.: _____

Architect: _____

PRODUCT CERTIFICATION: I certify that the installation work of my firm on this project:

1. [HAS] [HAS NOT] required the use of any ADHESIVES.
2. [HAS] [HAS NOT] required the use of any JOINT SEALANTS.
3. [HAS] [HAS NOT] required the use of any PAINTS OR COATINGS.
4. [HAS] [HAS NOT] required the use of any COMPOSITE WOOD or AGRIFIBER PRODUCTS.

Product data and MSDS sheets are attached.

CERTIFIED BY (Installer/Manufacturer/Supplier Firm):

Firm Name: _____

Print Name: _____

Signature: _____

Title: _____ (officer of company)

Date: _____

VOLATILE ORGANIC COMPOUND (VOC) RESTRICTIONS
SECTION 01 6116.10
3595001

END OF SECTION

*p:\sacramento\3595 tracy unified school district\001-000_villalovoz es new shade structures\08 specifications\06 spec\04 final\freiler
- shade struct\01 6116.10_volatile organic compound (voc) restrictions.docx
Last Updated: January 18, 2022*

SECTION 01 66 00

PRODUCT DELIVERY, STORAGE AND HANDLING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Site Access, Conditions and Requirements;
- B. Special Conditions.

1.02 PRODUCTS

- A. Products are as defined in the General Conditions.
- B. Contractor shall not use and/or reuse materials and/or equipment removed from existing Premises, except as specifically permitted by the Contract Documents.
- C. Contractor shall provide interchangeable components of the same manufacturer, for similar components.

1.03 TRANSPORTATION AND HANDLING

- A. Contractor shall transport and handle Products in accordance with manufacturer's instructions.
- B. Contractor shall promptly inspect shipments to confirm that Products comply with requirements, quantities are correct, and products are undamaged.
- C. Contractor shall provide equipment and personnel to handle Products by methods to prevent soiling, disfigurement, or damage.

1.04 STORAGE AND PROTECTION

- A. Contractor shall store and protect Products in accordance with manufacturer's instructions, with seals and labels intact and legible. Contractor shall store sensitive products in weather-tight, climate controlled enclosures.
- B. For exterior storage of fabricated Products, Contractor shall place on sloped supports, above ground.
- C. Contractor shall provide off-site storage and protection when Site does not permit on-site storage or protection.

- D. Contractor shall cover products subject to deterioration with impervious sheet covering and provide ventilation to avoid condensation.
- E. Contractor shall store loose granular materials on solid flat surfaces in a well-drained area and prevent mixing with foreign matter.
- F. Contractor shall provide equipment and personnel to store Products by methods to prevent soiling, disfigurement, or damage.
- G. Contractor shall arrange storage of Products to permit access for inspection and periodically inspect to assure Products are undamaged and are maintained under specified conditions.

PART 2 – PRODUCTS Not Used.

PART 3 - EXECUTION Not Used.

END OF DOCUMENT

FIELD ENGINEERING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Site Investigation, and Soils Investigation Report;
- B. Special Conditions;
- C. Site-Visit Certification.

1.02 REQUIREMENTS INCLUDED:

- A. Contractor shall provide and pay for field engineering services by a California-registered engineer, required for the project, including, without limitations:
 - (1) Survey work required in execution of the Project.
 - (2) Civil or other professional engineering services specified, or required to execute Contractor's construction methods.

1.03 QUALIFICATIONS OF SURVEYOR OR ENGINEERS:

Contractor shall only use a qualified licensed engineer or registered land surveyor, to whom District makes no objection.

1.04 SURVEY REFERENCE POINTS:

- A. Existing basic horizontal and vertical control points for the Project are those designated on the Drawings.
- B. Contractor shall locate and protect control points prior to starting Site Work and preserve all permanent reference points during construction. In addition Contractor shall:
 - (1) Make no changes or relocation without prior written notice to District and Architect.
 - (2) Report to District and Architect when any reference point is lost or destroyed, or requires relocation because of necessary changes in grades or locations.
 - (3) Require surveyor to replace Project control points based on original survey control that may be lost or destroyed.

1.05 RECORDS:

Contractor shall maintain a complete, accurate log of all control and survey work as it progresses.

1.06 SUBMITTALS:

- A. Contractor shall submit name and address of Surveyor and Professional Engineer to District and Architect prior to its/their work on the Project.
- B. On request of District and Architect, Contractor shall submit documentation to verify accuracy of field engineering work, at no additional cost to the District.
- C. Contractor shall submit a certificate signed by registered engineer or surveyor certifying that elevations and locations of improvements are in conformance or nonconformance with Contract Documents.

PART 2 – PRODUCTS Not Used.

PART 3 - EXECUTION

3.01 COMPLIANCE WITH LAWS:

Contractor is responsible for meeting all applicable codes, OSHA, safety and shoring requirements.

3.02 NONCONFORMING WORK:

Contractor is responsible for any re-surveying required by correction of nonconforming work.

END OF DOCUMENT

CUTTING AND PATCHING

PART 1 – GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Inspector, Inspections, and Tests, Integration of Work, Nonconforming Work, and Correction of Work, and Uncovering Work;
- B. Special Conditions;
- C. Imported Materials Certification.

1.02 CUTTING AND PATCHING:

- A. Contractor shall be responsible for all cutting, fitting, and patching, including associated excavation and backfill, required to complete the Work or to:
 - (1) Make several parts fit together properly.
 - (2) Uncover portions of Work to provide for installation of ill-timed Work.
 - (3) Remove and replace defective Work.
 - (4) Remove and replace Work not conforming to requirements of Contract Documents.
 - (5) Remove Samples of installed Work as specified for testing.
 - (6) Provide routine penetrations of non-structural surfaces for installation of piping and electrical conduit.
 - (7) Attaching new materials to existing remodeling areas – including painting (or other finishes) to match existing conditions.
- B. In addition to Contract requirements, upon written instructions from the District, Contractor shall uncover Work to provide for observations of covered Work in accordance with the Contract Documents; remove samples of installed materials for testing as directed by District; and remove Work to provide for alteration of existing Work.
- C. Contractor shall not cut or alter Work, or any part of it, in such a way that endangers or compromises the integrity of the Work, the Project, or work of others.

1.03 SUBMITTALS:

- A. Prior to any cutting or alterations that may affect the structural safety of Project, or work of others, and well in advance of executing such cutting or alterations, Contractor shall submit written notice to District pursuant to the applicable notice provisions of the Contract Documents, requesting consent to proceed with the cutting or alteration, including the following:
 - (1) The work of the District or other trades.
 - (2) Structural value or integrity of any element of Project.
 - (3) Integrity or effectiveness of weather-exposed or weather-resistant elements or systems.
 - (4) Efficiency, operational life, maintenance or safety of operational elements.
 - (5) Visual qualities of sight-exposed elements.
- B. Contractor's Request shall also include:
 - (1) Identification of Project.
 - (2) Description of affected Work.
 - (3) Necessity for cutting, alteration, or excavations.
 - (4) Effects of Work on District, other trades, or structural or weatherproof integrity of Project.
 - (5) Description of proposed Work:
 - (a) Scope of cutting, patching, alteration, or excavation.
 - (b) Trades that will execute Work.
 - (c) Products proposed to be used.
 - (d) Extent of refinishing to be done.
 - (6) Alternates to cutting and patching.
 - (7) Cost proposal, when applicable.
 - (8) The scheduled date the Contractor intends to perform the Work and the duration of time to complete the Work.
 - (9) Written permission of District or other District contractor(s) whose work will be affected.

1.04 QUALITY ASSURANCE:

- A. Contractor shall ensure that cutting, fitting, and patching shall achieve security, strength, weather protection, appearance for aesthetic match, efficiency, operational life, maintenance, safety of operational elements, and the continuity of existing fire ratings.
- B. Contractor shall ensure that cutting, fitting, and patching shall successfully duplicate undisturbed adjacent profiles, materials, textures, finishes, colors, and that materials shall match existing construction. Where there is dispute as to whether duplication is successful or has been achieved to a reasonable degree, the District's decision shall be final.

1.05 PAYMENT FOR COSTS:

- A. Cost caused by ill-timed or defective Work or Work not conforming to Contract Documents, including costs for additional services of the District, its consultants, including but not limited to the Construction Manager, the Architect, the Project Inspector(s), Engineers, and Agents, will be paid by Contractor and/or deducted from the Contract by the District.
- B. District shall only pay for cost of Work if it is part of the original Contract Price or if a change has been made to the contract in compliance with the provisions of the General Conditions. Cost of Work performed upon instructions from the District, other than defective or nonconforming Work, will be paid by District on approval of written Change Order. Contractor shall provide written cost proposals prior to proceeding with cutting and patching.

PART 2 - PRODUCTS

2.01 MATERIALS:

- A. Contractor shall provide for replacement and restoration of Work removed. Contractor shall comply with the Contract Documents and with the Industry Standard(s), for the type of Work, and the Specification requirements for each specific product involved. If not specified, Contractor shall first recommend a product of a manufacturer or appropriate trade association for approval by the District.
- B. Materials to be cut and patched include those damaged by the performance of the Work.

PART 3 – EXECUTION

3.01 INSPECTION:

- A. Contractor shall inspect existing conditions of the Site and the Work, including elements subject to movement or damage during cutting and patching, excavating and backfilling. After uncovering Work, Contractor shall inspect conditions affecting installation of new products.

- B. Contractor shall report unsatisfactory or questionable conditions in writing to District as indicated in the General Conditions and shall proceed with Work as indicated in the General Conditions by District.

3.02 PREPARATION:

- A. Contractor shall provide shoring, bracing and supports as required to maintain structural integrity for all portions of the Project, including all requirements of the Project.
- B. Contractor shall provide devices and methods to protect other portions of Project from damage.
- C. Contractor shall, provide all necessary protection from weather and extremes of temperature and humidity for the Project, including without limitation, any work that may be exposed by cutting and patching Work. Contractor shall keep excavations free from water.

3.03 ERECTION, INSTALLATION AND APPLICATION:

- A. With respect to performance, Contractor shall:
 - (1) Execute fitting and adjustment of products to provide finished installation to comply with and match specified tolerances and finishes.
 - (2) Execute cutting and demolition by methods that will prevent damage to other Work, and provide proper surfaces to receive installation of repairs and new Work.
 - (3) Execute cutting, demolition excavating, and backfilling by methods that will prevent damage to other Work and damage from settlement.
- B. Contractor shall employ original installer or fabricator to perform cutting and patching for:
 - (1) Sight-exposed finished surfaces.
- C. Contractor shall execute fitting and adjustment of products to provide a finished installation to comply with specified products, functions, tolerances, and finishes as shown or specified in the Contract Documents including, without limitation, the Drawings and Specifications.
- D. Contractor shall fit Work airtight to pipes, sleeves, conduit, and other penetrations through surfaces. Contractor shall conform to all Code requirements for penetrations or the Drawings and Specifications, whichever calls for a higher quality or more thorough requirement. Contractor shall maintain integrity of both rated and non-rated fire walls, ceilings, floors, etc.
- E. Contractor shall restore Work which has been cut or removed. Contractor shall install new products to provide completed Work in accordance with requirements of the Contract Documents and as required to match surrounding areas and surfaces.

- F. Contractor shall refinish all continuous surfaces to nearest intersection as necessary to match the existing finish to any new finish.

END OF DOCUMENT

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes: Requirements and procedures for ensuring optimal diversion of construction waste materials generated by the Work from landfill disposal within the limits of the Construction Schedule and Contract Sum.
 - 1. The Work of this Contract requires that a minimum of **[65%]** by weight of the construction and demolition materials generated in the Work is diverted from landfill disposal through a combination of re-use and recycling activities.
 - 2. CAL-Green: Alternate waste reduction methods developed in cooperation with local agencies if diversion or recycle facilities capable of compliance with CAL-Green requirements do not exist within the haul boundary of the jobsite (California Code of Regulations, Title 24, Part 11, 5.408).
 - 3. **[LEED projects: Requirements for submittal of LEED documentation in compliance with Materials and Resources Credit 2.1 and Materials and Resources Credit 2.2, Construction Waste Management.]**
 - 4. Requirements for submittal of Contractor's Construction Waste and Recycling Plan prior to the commencement of the Work.
 - 5. Contractor's quantitative reports for construction waste materials as a condition of approval of progress payments submitted to the **[EDIT: Architect or Construction Manager]**

1.2 RELATED REQUIREMENTS

- A. Section 01 3516, Alteration Project Procedures.
- B. Section 01 5000, Temporary Facilities & Controls.
- C. Section 01 7329, Cutting and Patching.
- D. Section 01 8113, Sustainable Design Requirements, for CAL-Green general requirements and procedures.
- E. Section 02 2600, Hazardous Material Abatement (Various Materials).
- F. Section 02 2623, Asbestos Assessment.
- G. Section 02 2626, Lead Assessment.
- H. Section 02 2629, Hazardous Materials Assessment - PCB Ballast & Fluorescent Lamps.
- I. Section 02 4116, Building Demolition.
- J. Section 02 4119, Selective Demolition.
- K. Section 31 1000, Site Clearing.

CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL
SECTION 01 7419
3595001

1.3 REFERENCES AND STANDARDS

- A. California Green Building Standards Code (CALGreen), edition as noted on the drawings, as adopted by the California Division of the State Architect (DSA).

1.4 DEFINITIONS

- A. Class III Landfill: A landfill that accepts non-hazardous resources such as household, commercial, and industrial waste, resulting from construction, remodeling, repair, and demolition operations. A Class III landfill must have a solid waste facilities permit from the California Integrated Waste Management Board (CIWMB) and is regulated by the Enforcement Agency (EA).
- B. Construction and Demolition Debris: Building materials and solid waste resulting from construction, remodeling, repair, cleanup, or demolition operations that are not hazardous as defined in California Code of Regulations, Title 22, Section 66261.3 et seq. This term includes, but is not limited to, asphalt concrete, Portland cement concrete, brick, lumber, gypsum wallboard, cardboard and other associated packaging, roofing material, ceramic tile, carpeting, plastic pipe, and steel. The debris may be commingled with rock, soil, tree stumps, and other vegetative matter resulting from land clearing and landscaping for construction or land development projects.
- C. C&D Recycling Center: A facility that receives only construction and demolition debris material that has been separated for reuse prior to receipt, in which the residual (disposed) amount of waste in the material is less than 10% of the amount separated for reuse by weight.
- D. Disposal: Final deposition of construction and demolition or inert debris into land, including stockpiling onto land of construction and demolition debris that has not been sorted for further processing or resale, if such stockpiling is for a period of time greater than 30 days; and construction and demolition debris that has been sorted for further processing or resale, if such stockpiling is for a period of time greater than one year, or stockpiling onto land of inert debris that is for a period of time greater than one year.
- E. Enforcement Agency (EA): Enforcement agency is the authority having jurisdiction within the Project location.
- F. Inert Disposal Facility or Inert Waste Landfill: A disposal facility that accepts only inert waste such as soil and rock, fully cured asphalt paving, uncontaminated concrete (including fiberglass or steel reinforcing rods embedded in the concrete), brick, glass, and ceramics, for land disposal.
- G. Mixed Debris: Loads that include commingled recyclable and non-recyclable materials generated at the construction site.
- H. Mixed Debris Recycling Facility: A processing facility that accepts loads of commingled construction and demolition debris for the purpose of recovering re-usable and recyclable materials and disposing the non-recyclable residual materials.

CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL
SECTION 01 7419
3595001

- I. Recycling: The process of sorting, cleansing, treating and reconstituting materials for the purpose of using the altered form in the manufacture of a new product. Recycling does not include burning, incinerating or thermally destroying solid waste.
- J. Reuse. The use, in the same or similar form as it was produced, of a material which might otherwise be discarded.
- K. Separated for Reuse. Materials, including commingled recyclables, that have been separated or kept separate from the solid waste stream for the purpose of additional sorting or processing those materials for reuse or recycling in order to return them to the economic mainstream in the form of raw material for new, reused, or reconstituted products which meet the quality standards necessary to be used in the marketplace, and includes materials that have been "source separated".
- L. Solid Waste: All putrescible and nonputrescible solid, semisolid, and liquid wastes, including garbage, trash, refuse, paper, rubbish, ashes, industrial wastes, demolition and construction wastes, abandoned vehicles and parts thereof, discarded home and industrial appliances, dewatered, treated, or chemically fixed sewage sludge which is not hazardous waste, manure, vegetable or animal solid and semisolid wastes, and other discarded solid and semisolid wastes. "Solid waste" does not include hazardous waste, radioactive waste, or medical waste as defined or regulated by State law.
- M. Source-Separated: Materials, including commingled recyclables, that have been separated or kept separate from the solid waste stream at the point of generation, for the purpose of additional sorting or processing of those materials for reuse or recycling in order to return them to the economic mainstream in the form of raw materials for new, reused, or reconstituted products which meet the quality standards necessary to be used in the marketplace.
- N. Waste Hauler: A company that possesses a valid permit from the local waste management authority having jurisdiction to collect and transport solid wastes from individuals or businesses for the purpose of recycling or disposal.

1.5 ADMINISTRATIVE REQUIREMENTS

- A. Submittal Procedures:
 - 1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
 - 2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
 - 3. Sustainable Design Submittals shall comply with the additional requirements of Section 01 8113, Sustainable Design Requirements.

1.6 ACTION SUBMITTALS

- A. Contractor's Construction Waste and Recycling Plan:
 - 1. Review Contract Documents and estimate the types and quantities of materials under the Work that are anticipated to be feasible for on-site processing, source separation for re-use or recycling. Indicate the procedures that will be implemented

CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL
SECTION 01 7419
3595001

- in this program to effect jobsite source separation, such as, identifying a convenient location where dumpsters would be located, putting signage to identify materials to be placed in dumpsters, etc.
2. Prior to commencing the Work, submit Contractor's Construction Waste and Recycling Plan. Submit in format provided with this specification section. The Plan must include, but is not limited to the following:
 - a. Contractor's name and project identification information;
 - b. Procedures to be used;
 - c. Materials to be re-used and recycled;
 - d. Estimated quantities of materials;
 - e. Names and locations of re-use and recycling facilities/sites;
 - f. Tonnage calculations that demonstrate that Contractor will re-use and recycle a minimum of **[65%]** by weight of the construction waste materials generated by the Work.
 3. Contractor's Construction Waste and Recycling Plan must be approved by the Architect prior to the start of Work.
 4. Contractor's Construction Waste and Recycling Plan will not otherwise relieve the Contractor of responsibility for adequate and continuing control of pollutants and other environmental protection measures

1.7 INFORMATIONAL SUBMITTALS

- A. Contractor's Reuse, Recycling, and Disposal Report:
 1. Submit Contractor's Reuse, Recycling, and Disposal Report on the form provided with this specification section with each Application & Certificate for Payment. Failure to submit the form and its supporting documentation will render the Application & Certificate for Payment incomplete and delay progress payments. If applicable, include manifests, weight tickets, receipts, and invoices specifically identifying the Project for re-used and recycled materials:
 - a. Reuse of building materials or salvage items on site (i.e. crushed base or red clay brick).
 - b. Salvaging building materials or salvage items at an offsite salvage or reuse center (i.e. lighting, fixtures).
 - c. Recycling source separated materials on site (i.e. crushing asphalt/concrete for base course, or grinding for mulch).
 - d. Recycling source separated material at an offsite recycling center (i.e. scrap metal or green materials).
 - e. Use of material as Alternative Daily Cover (ADC) at landfills.
 - f. Delivery of soils or mixed inerts to an inert landfill for disposal (inert fill).
 - g. Disposal at a landfill or transfer station (where no recycling takes place).
 - h. Other (describe).
 2. Contractor's Reuse, Recycling, and Disposal Report must quantify all materials generated in the Work, disposed in Class III landfills, or diverted from disposal through recycling. Indicate zero (0) if there is no quantity to report for a type of material. As indicated on the form:

CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL
SECTION 01 7419
3595001

- a. Report disposal or recycling either in tons or in cubic yards. If scales are available at disposal or recycling facility, report in tons; otherwise, report in cubic yards. Report in units for salvage items when no tonnage or cubic yard measurement is feasible.
 - b. Indicate locations to which materials are delivered for reuse, salvage, recycling, accepted as daily cover, inert backfill, or disposal in landfills or transfer stations.
 - c. Provide legible copies of weight tickets, receipts, or invoices that specifically identify the project generating the material. Said documents must be from recyclers and/or disposal site operators that can legally accept the materials for the purpose of re-use, recycling, or disposal.
 - 1) Indicate project title, project number, progress payment number, name of the company completing the Contractor's Report and compiling backup documentation, the printed name, signature, and daytime phone number of the person completing the form, the beginning and ending dates of the period covered on the Contractor's Report, and the date that the Contractor's Report is completed.
3. Demonstrate compliance with California Code of Regulations, Title 24, Part 11 California Green Building Standards Code, "CAL-Green" 5.408.2, to the satisfaction of the enforcing agency.
- a. Landfill **[and Incinerator]** Disposal Records: Indicate receipt and acceptance of waste by landfills **[and incinerator]** facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.
 - b. Recycling and Processing Facility Records: Indicate receipt and acceptance of recyclable waste by recycling and processing facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.
- B. **[For LEED Projects only]** LEED Letter Template: Materials and Resources Credit **[2.1]**
[2.2] Construction Waste Management
- 1. Complete and sign LEED Letter Template in format provided under the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED) program. Prepare Letter Template on company letterhead.
 - a. Certify that the project has completed a waste management plan and diverted construction, demolition, and land clearing waste to uses other than landfill.
 - b. Provide quantities of diverted materials and means of diversion in the table provided in the LEED Letter Template.
 - c. Indicate how and where waste was diverted.
 - d. Indicate quantities of waste diverted in tons or cubic yards.
 - e. Letter Template will calculate: Total quantity of diverted waste, total quantity of waste, and the percentage of waste diverted.
 - f. For projects where 50% of waste is diverted, one LEED credit will be achieved; where 75% is diverted, two LEED credits will be achieved.
 - g. Include name, organization, role in project, provide signature and date complete

CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL
SECTION 01 7419
3595001

PART 2 - PRODUCTS-NOT USED

PART 3 - EXECUTION

3.1 WASTE MANAGEMENT PLAN

- A. Implement procedures for disposal of materials, as specified in Contractor's Construction Waste and Recycling Plan, which are not diverted for re-use, salvage or recycling.
 - 1. Identify materials to be diverted from disposal by efficient usage, recycling, reuse on the project, or salvage for future use or sale.
 - 2. Determine if materials will be sorted on-site or mixed.
 - 3. Identify diversion facilities where material collected will be taken.
 - 4. Specify that quantities of diverted material will be calculated by weight or volume, but not both.

3.2 SALVAGE, RE-USE, RECYCLING AND PROCEDURES

- A. Re-use, Salvage, and Recycling Facilities: As specified in Contractor's Construction Waste and Recycling Plan.
- B. Develop and implement procedures to re-use, salvage, and recycle new construction and excavation materials, based on the Contract Documents, the Contractor's Construction Waste and Recycling Plan, estimated quantities of available materials, and availability of recycling facilities. Procedures may include on-site recycling, source separated recycling, and/or mixed debris recycling efforts.
 - 1. Identify materials that are feasible for salvage, determine requirements for site storage, and transportation of materials to a salvage facility.
 - 2. Source separate new construction, excavation and demolition materials including, but not limited to the following types.
 - a. Asphalt.
 - b. Concrete, concrete block, slump stone (decorative concrete block), and rocks.
 - c. Drywall.
 - d. Green materials (i.e. tree trimmings and land clearing debris).
 - e. Metal (ferrous and non-ferrous).
 - f. Miscellaneous Construction Debris.
 - g. Paper or cardboard.
 - h. Red Clay Brick.
 - i. Reuse or Salvage Materials
 - j. Soils.
 - k. Wire and Cable.
 - l. Wood.
 - m. Other (describe)

CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL
SECTION 01 7419
3595001

3. Miscellaneous Construction Debris: Develop and implement a program to transport loads of mixed (commingled) new construction materials that cannot be feasibly source separated to a mixed materials recycling facility

3.3 DISPOSAL OPERATIONS AND WASTE HAULING

- A. Legally transport and dispose of materials that cannot be delivered to a source separated or mixed recycling facility to a transfer station or disposal facility that can legally accept the materials for the purpose of disposal.
- B. Use a permitted waste hauler or Contractor's trucking services and personnel. To confirm valid permitted status of waste haulers, contact the local solid waste authority having jurisdiction.
- C. Become familiar with the conditions for acceptance of new construction, excavation and demolition materials at recycling facilities, prior to delivering materials.
- D. Deliver to facilities that can legally accept new construction, excavation and demolition materials for purpose of re-use, recycling, composting, or disposal.
- E. Do not burn, bury or otherwise dispose of solid waste on the project job-site.

3.4 RE-USE AND DONATION OPTIONS

- A. Implement a re-use program to the greatest extent feasible. Options may include:
 1. California Materials Exchange (CAL-MAX) Program is sponsored by the California Integrated Waste Management Board. CAL-MAX is a free service provided by the California Integrated Waste Management Board, designed to help businesses find markets for materials that traditionally would be discarded. The premise of the CAL-MAX Program is that material discarded by one business may be a resource for another business. To obtain a current Materials Listings Catalog, call CAL-MAX/California Integrated Waste Management Board at (916) 255-2369 or send a FAX to (916) 255-2200. The CALMAX Catalog is available through the Internet Site at <http://www.ciwmb/ca.gov/calmax>.

3.5 REVENUE

- A. Revenues or other savings obtained from recycled, re-used, or salvaged materials shall accrue to Contractor unless otherwise noted in the Contract Documents

END OF SECTION

p:\sacramento\3595 tracy unified school district\001-000_villalovoz es new shade structures\08 specifications\06 spec\04 final\freiler - shade struct\01 7419_construction waste management and disposal.docx
Last Updated: December 16, 2021

SECTION 01 7419A
CONTRACTOR'S CONSTRUCTION WASTE AND RECYCLING PLAN
(Submit After Award of Contract and Prior to Start of Work)

Project Title:		
Contract or Work Order No.:		
Contractor's Name:		
Street Address:		
City:	State:	Zip:
Phone: ()	Fax: ()	
E-Mail Address:		
Prepared by: (Print Name)		

Date Submitted:		
Project Period:	From:	TO:

Reuse, Recycling or Disposal Processes To Be Used

Describe the types of recycling processes or disposal activities that will be used for material generated in the project. Indicate the type of process or activity by number, types of materials, and estimated quantities that will be recycled or disposed in the sections below:

- 01 - Reuse of building materials or salvage items on site (i.e. crushed base or red clay brick)
- 02 - Salvaging building materials or salvage items at an off site salvage or re-use center (i.e. lighting, fixtures)
- 03 - Recycling source separated materials on site (i.e. crushing asphalt/concrete for reuse or grinding for mulch)
- 04 - Recycling source separated materials at an off site recycling center (i.e. scrap metal or green matls)
- 05 - Recycling commingled loads of C&D matls at an off site mixed debris recycling center or transfer station
- 06 - Recycling material as Alternative Daily Cover at landfills
- 07 - Delivery of soils or mixed inerts to an inert landfill for disposal (inert fill).
- 08 - Disposal at a landfill or transfer station.
- 09 - Other (please describe) _____

Types of Material To Be Generated

Use these codes to indicate the types of material that will be generated on the project

A = Asphalt	C = Concrete	M = Metals	I = Mixed Inert	G = Green Matls
D = Drywall	P/C=Paper/Cardboard	W/C = Wire/Cable	S= Soils (Non Hazardous)	
M/C = Miscellaneous Construction Debris	R = Reuse/Salvage	W = Wood	O = Other (describe)	

Facilities Used: Provide Name of Facility and Location (City)

Total Truck Loads: Provide Number of Trucks Hauled from Site During Reporting Period

Total Quantities: If scales are available at sites, report in tons. If not, quantify by cubic yards. For salvage/reuse items, quantify by estimated weight (or units).

SECTION I - RE-USED/RECYCLED MATERIALS

Include all recycling activities for source separated or mixed material recycling centers where recycling will occur.

Type of Material	Type of Activity	Facility to be Used/Location	Total Truck Loads	Total Quantities		
				Tons	Cubic YD	Other Wt.
(ex.) M	04	ABC Metals, Los Angeles	24	355		
a. Total Diversion			0	0	0	0

SECTION 01 7419A
CONTRACTOR'S CONSTRUCTION WASTE AND RECYCLING PLAN
Continued

SECTION II - DISPOSED MATERIALS						
<i>Include all disposal activities for landfills, transfer stations, or inert landfills where no recycling will occur.</i>						
Type of Material	Type of Activity	Facility to be Used/Location	Total Truck Loads	Total Quantities		
				Tons	Cubic YD	Other Wt.
(ex.) D	08	DEF Landfill, Los Angeles	2	35		
b. Total Disposal				0	0	0

SECTION III - TOTAL MATERIALS GENERATED						
<i>This section calculates the total materials to be generated during the project period (Reuse/Recycle + Disposal = Generation)</i>						
				Tons	Cubic YD	Other Wt.
a. Total Reused/Recycled				0	0	0
b. Total Disposed				0	0	0
c. Total Generated				0	0	0

SECTION IV - CONTRACTOR'S LANDFILL DIVERSION RATE CALCULATION						
<i>Add totals from Section I + Section II</i>						
	Tons	Cubic Yards	Other Wt.			
a. Materials Re-Used and Recycled	0					
b. Materials Disposed	0					
c. Total Materials Generated (a. + b. = c.)	0	0	0			
d. Landfill Diversion Rate (Tons Only)*	#DIV/0!					

* Use tons only to calculate recycling percentages: Tons Reused/Recycled/Tons Generated = % Recycled

Contractor's Comments (Provide any additional information pertinent to planned reuse, recycling, or disposal activities):

Notes:

1. Suggested Conversion Factors: From Cubic Yards to Tons (Use when scales are not available)

Asphalt: .61 (ex. 1000 CY Asphalt = 610 tons. Applies to broken chunks of asphalt)

Concrete: .93 (ex. 1000 CY Concrete = 930 tons. Applies to broken chunks of concrete)

Ferrous Metals: .22 (ex. 1000 CY Ferrous Metal = 220 tons)

Non-Ferrous Metals: .10 (ex. 1000 CY Non-Ferrous Metals = 100 tons)

Drywall Scrap: .20

Wood Scrap: .16

SECTION 01 7419B
CONTRACTOR'S REUSE, RECYCLING, AND DISPOSAL REPORT
(Submit With Each Progress Payment)

Project Title:		
Contract or Work Order No.:		
Contractor's Name:		
Street Address:		
City:	State:	Zip:
Phone: ()	Fax: ()	
E-Mail Address:		
Prepared by: (Print Name)		

Date Submitted:		
Period Covered:	From:	To:

Reuse, Recycling or Disposal Processes Used

Describe the types of recycling processes or disposal activities used for material generated in the project. Indicate the type of process or activity by number, types of materials, and quantities that were recycled or disposed in the sections below:

- 01 - Reuse of building materials or salvage items on site (i.e. crushed base or red clay brick)
- 02 - Salvaging building materials or salvage items at an off site salvage or re-use center (i.e. lighting, fixtures)
- 03 - Recycling source separated materials on site (i.e. crushing asphalt/concrete for reuse or grinding for mulch)
- 04 - Recycling source separated materials at an off site recycling center (i.e. scrap metal or green matls)
- 05 - Recycling commingled loads of C&D matls at an off site mixed debris recycling center or transfer station
- 06 - Recycling material as Alternative Daily Cover at landfills
- 07 - Delivery of soils or mixed inerts to an inert landfill for disposal (inert fill).
- 08 - Disposal at a landfill or transfer station.
- 09 - Other (please describe) _____

Types of Material Generated

Use these codes to indicate the types of material that were generated on the project

A = Asphalt	C = Concrete	M = Metals	I = Mixed Inert	G = Green Matls
D = Drywall	P/C=Paper/Cardboard	W/C = Wire/Cable	S= Soils (Non Hazardous)	
M/C = Miscellaneous Construction Debris	R = Reuse/Salvage	W = Wood	O = Other (describe)	

Facilities Used: Provide Name of Facility and Location (City)

Total Truck Loads: Provide Number of Trucks Hauled from Site During Reporting Period

Total Quantities: If scales are available at sites, report in tons. If not, quantify by cubic yards. For salvage/reuse items, quantify by estimated weight (or units).

SECTION I - RE-USED/RECYCLED MATERIALS

Include all recycling activities for source separated or mixed material recycling centers where recycling occurred.

Type of Material	Type of Activity	Facilities Used/Location	Total Truck Loads	Total Quantities		
				Tons	Cubic YD	Other Wt.
(ex.) M	04	ABC Metals, Los Angeles	24	355		
a. Total Diversion			0	0	0	0

[PROJECT TITLE]
[DATE]

Contractor's Reuse, Recycling, and Disposal Report
Section 01 7419B-1

SECTION 01 7419B
CONTRACTOR'S REUSE, RECYCLING, AND DISPOSAL REPORT
Continued

SECTION II - DISPOSED MATERIALS						
<i>Include all disposal activities for landfills, transfer stations, or inert landfills where no recycling occurred.</i>						
Type of Material	Type of Activity	Facilities Used/Location	Total Truck Loads	Total Quantities		
				Tons	Cubic YD	Other Wt.
(ex.) D	08	DEF Landfill, Los Angeles	2	35		
b. Total Disposal				0	0	0

SECTION III - TOTAL MATERIALS GENERATED						
<i>This section calculates the total materials generated during the project period (Reuse/Recycle + Disposal = Generation)</i>						
				Tons	Cubic YD	Other Wt.
a. Total Reused/Recycled				0	0	0
b. Total Disposed				0	0	0
c. Total Generated				0	0	0

SECTION IV - CONTRACTOR'S LANDFILL DIVERSION RATE CALCULATION						
<i>Add totals from Section I + Section II</i>						
	Tons	Cubic Yards	Other Wt.			
a. Materials Re-Used and Recycled	0					
b. Materials Disposed	0					
c. Total Materials Generated (a. + b. = c.)	0	0	0			
d. Landfill Diversion Rate (Tons Only)*	#DIV/0!					

* Use tons only to calculate recycling percentages: Tons Reused/Recycled/Tons Generated = % Recycled

Contractor's Comments (<i>Provide any additional information pertinent to planned reuse, recycling, or disposal activities</i>):						

Notes:

- Suggested Conversion Factors: From Cubic Yards to Tons (Use when scales are not available)
Asphalt: .61 (ex. 1000 CY Asphalt = 610 tons. Applies to broken chunks of asphalt)
Concrete: .93 (ex. 1000 CY Concrete = 930 tons. Applies to broken chunks of concrete)
Ferrous Metals: .22 (ex. 1000 CY Ferrous Metal = 220 tons)
Non-Ferrous Metals: .10 (ex. 1000 CY Non-Ferrous Metals = 100 tons)
Drywall Scrap: .20
Wood Scrap: .16

ALTERATION PROJECT PROCEDURES

PART 1 – GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Integration of Work, Purchase of Materials and Equipment, Uncovering of Work and Non-conforming Work and Correction of Work and Trenches;
- B. Special Conditions.

PART 2 - PRODUCTS

2.01 PRODUCTS FOR PATCHING AND EXTENDING WORK:

- A. New Materials: As specified in the Contract Documents including, without limitation, in the Specifications, Contractor shall match existing products, conditions, and work for patching and extending work.
- B. Type and Quality of Existing Products: Contractor shall determine by inspection, by testing products where necessary, by referring to existing conditions and to the Work as a standard.

PART 3 - EXECUTION

3.01 EXAMINATION:

- A. Contractor shall verify that demolition is complete and that areas are ready for installation of new Work.
- B. By beginning restoration Work, Contractor acknowledges and accepts the existing conditions.

3.02 PREPARATION:

- A. Contractor shall cut, move, or remove items as necessary for access to alterations and renovation Work. Contractor shall replace and restore these at completion.
- B. Contractor shall remove unsuitable material not as salvage unless otherwise indicated in the Contract Documents. Unsuitable material may include, without limitation, rotted wood, corroded metals, and deteriorated masonry and concrete. Contractor shall replace materials as specified for finished Work.

- C. Contractor shall remove debris and abandoned items from all areas of the Site and from concealed spaces.
- D. Contractor shall prepare surface and remove surface finishes to provide for proper installation of new Work and finishes.

3.03 INSTALLATION:

- A. Contractor shall coordinate Work of all alternations and renovations to expedite completion and to accommodate District occupancy.
- B. Designated Areas and Finishes: Contractor shall complete all installations in all respects, including operational, and electrical work.
- C. Contractor shall remove, cut, and patch Work in a manner to minimize damage and to provide a means of restoring Products and finishes to original or specified condition.
- D. Contractor shall refinish visible existing surfaces to remain to specified condition for each material, with a neat and square or straight transition to adjacent finishes.
- E. Contractor shall install products as specified in the Contract Documents, including without limitation, the Specifications.

3.04 TRANSITIONS:

- A. Where new Work abuts or aligns with existing, Contractor shall perform a smooth and even transition. Patched Work must match existing adjacent work in texture and appearance.
- B. When finished surfaces are cut so that a smooth transition with new Work is not possible, Contractor shall terminate existing surface along a straight line at a natural line of division and make a recommendation for resolution to the District and the Architect for review and approval.

3.05 ADJUSTMENTS:

- A. Where a change of plane of 1/4 inch or more occurs, Contractor shall submit a recommendation for providing a smooth transition to the District and the Architect for review and approval.
- B. Contractor shall fit Work at penetrations of surfaces.

3.06 REPAIR OF DAMAGED SURFACES:

- A. Contractor shall patch or replace portions of existing surfaces, which are damaged, lifted, discolored, or showing other imperfections, in the area where the Work is performed.
- B. Contractor shall repair substrate prior to patching finish.

3.07 CULTIVATED AREAS AND OTHER SURFACE IMPROVEMENTS:

- A. Cultivated or planted areas and other surface improvements which are damaged by actions of the Contractor shall be restored by Contractor to their original condition or better, where indicated.
- B. Contractor shall protect and replace, if damaged, all existing guard posts, barricades, and fences.
- C. Contractor shall give special attention to avoid damaging or killing trees, bushes and/or shrubs on the Premises and/or identified in the Contract Documents, including without limitation, the Drawings.

3.08 FINISHES:

- A. Contractor shall finish surfaces as specified in the Contract Documents, including without limitations, the provisions of all Divisions of the Specifications.
- B. Contractor shall finish patches to produce uniform finish and texture over entire area. When finish cannot be matched, Contractor shall refinish entire surface to nearest intersections.

3.09 CLEANING:

- A. Contractor shall continually clean the Site and the Premises as indicated in the Contract Documents, including without limitation, the provisions in the General Conditions and the Specifications regarding cleaning.

END OF DOCUMENT

CONTRACT CLOSEOUT AND FINAL CLEANING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Completion of Work;
- B. Special Conditions;
- C. Temporary Facilities and Controls.

1.02 CLOSEOUT PROCEDURES

Contractor shall comply with all closeout provisions as indicated in the General Conditions.

1.03 FINAL CLEANING

- A. Contractor shall execute final cleaning prior to final inspection.
- B. Contractor shall clean interior and exterior glass and all surfaces exposed to view; remove temporary labels, tape, stains, and foreign substances, polish transparent and glossy surfaces, wax and polish new vinyl floor surfaces, vacuum carpeted and soft surfaces.
- C. Contractor shall clean equipment and fixtures to a sanitary condition.
- D. Contractor shall replace filters of operating equipment.
- E. Contractor shall clean debris from roofs, gutters, down spouts, and drainage systems.
- F. Contractor shall clean Site, sweep paved areas, and rake clean landscaped surfaces.
- G. Contractor shall remove waste and surplus materials, rubbish, and construction facilities from the Site and surrounding areas.

1.04 ADJUSTING

Contractor shall adjust operating products and equipment to ensure smooth and unhindered operation.

1.05 RECORD DOCUMENTS AND SHOP DRAWINGS

- A. Contractor shall legibly mark each item to record actual construction, including:
 - (1) Measured depths of foundation in relation to finish floor datum.
 - (2) Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permit surface improvements.
 - (3) Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.
 - (4) Field changes of dimension and detail.
 - (5) Details not on original Contract Drawings
 - (6) Changes made by modification(s).
 - (7) References to related Shop Drawings and modifications.
- B. Contractor will provide one set of Record Drawings to District.
- C. Contractor shall submit all required documents to District and/or Architect prior to or with its final Application for Payment.

1.06 INSTRUCTION OF DISTRICT PERSONNEL

- A. Before final inspection, at agreed upon times, Contractor shall instruct District's designated personnel in operation, adjustment, and maintenance of products, equipment, and systems.
- B. For equipment requiring seasonal operation, Contractor shall perform instructions for other seasons within six months or by the change of season.
- C. Contractor shall use operation and maintenance manuals as basis for instruction. Contractor shall review contents of manual with personnel in detail to explain all aspects of operation and maintenance.
- D. Contractor shall prepare and insert additional data in Operation and Maintenance Manual when the need for such data becomes apparent during instruction.
- E. Contractor shall review contents of manual with personnel in detail to explain all aspects of operation and maintenance.

1.07 SPARE PARTS AND MAINTENANCE MATERIALS

- A. Contractor shall provide products, spare parts, maintenance, and extra materials in quantities specified in the Specifications and in Manufacturer's recommendations.

- B. Contractor shall provide District with all required Operation and Maintenance Data at one time. Partial or piecemeal submissions of Operation and Maintenance Data will not be accepted.

PART 2 – PRODUCTS Not Used.

PART 3 – EXECUTION Not Used.

END OF DOCUMENT

OPERATION AND MAINTENANCE DATA

PART 1 – GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Completion of the Work;
- B. Special Conditions.

1.02 QUALITY ASSURANCE:

Contractor shall prepare instructions and data by personnel experienced in maintenance and operation of described products.

1.03 FORMAT:

- A. Contractor shall prepare data in the form of an instructional manual entitled "OPERATIONS AND MAINTENANCE MANUAL & INSTRUCTIONS" ("Manual").
- B. Binders: Contractor shall use commercial quality, 8-1/2 by 11 inch, three-side rings, with durable plastic covers; two inch maximum ring size. When multiple binders are used, Contractor shall correlate data into related consistent groupings.
- C. Cover: Contractor shall identify each binder with typed or printed title "OPERATION AND MAINTENANCE MANUAL & INSTRUCTIONS"; and shall list title of Project and identify subject matter of contents.
- D. Contractor shall arrange content by systems process flow under section numbers and sequence of Table of Contents of the Contract Documents.
- E. Contractor shall provide tabbed fly leaf for each separate product and system, with typed description of product and major component parts of equipment.
- F. Text: The content shall include Manufacturer's printed data, or typewritten data on 24 pound paper.
- G. Drawings: Contractor shall provide with reinforced punched binder tab and shall bind in with text; folding larger drawings to size of text pages.

1.04 CONTENTS, EACH VOLUME:

- A. Table of Contents: Contractor shall provide title of Project; names, addresses, and telephone numbers of the Architect, any engineers, subconsultants, Subcontractor(s), and Contractor with name of responsible parties; and schedule of products and systems, indexed to content of the volume.

- B. For Each Product or System: Contractor shall list names, addresses, and telephone numbers of Subcontractor(s) and suppliers, including local source of supplies and replacement parts.
- C. Product Data: Contractor shall mark each sheet to clearly identify specific products and component parts, and data applicable to installation. Delete inapplicable information.
- D. Drawings: Contractor shall supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams. Contractor shall not use Project Record Documents as maintenance drawings.
- E. Text: Contractor shall include any and all information as required to supplement product data. Contractor shall provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions.
- F. Warranties and Bonds: Contractor shall bind in one copy of each.

1.05 MANUAL FOR MATERIALS AND FINISHES:

- A. Building Products, Applied Materials, and Finishes: Contractor shall include product data, with catalog number, size, composition, and color and texture designations. Contractor shall provide information for re-ordering custom manufactured products.
- B. Instructions for Care and Maintenance: Contractor shall include Manufacturer's recommendations for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.
- C. Moisture Protection and Weather Exposed Products: Contractor shall include product data listing applicable reference standards, chemical composition, and details of installation. Contractor shall provide recommendations for inspections, maintenance, and repair.
- D. Additional Requirements: Contractor shall include all additional requirements as specified in the Specifications.
- E. Contractor shall provide a listing in Table of Contents for design data, with tabbed fly sheet and space for insertion of data.

1.06 MANUAL FOR EQUIPMENT AND SYSTEMS:

- A. Each Item of Equipment and Each System: Contractor shall include description of unit or system, and component parts and identify function, normal operating characteristics, and limiting conditions. Contractor shall include performance curves, with engineering data and tests, and complete nomenclature, and commercial number of replaceable parts.
- B. Panelboard Circuit Directories: Contractor shall provide electrical service characteristics, controls, and communications.

- C. Contractor shall include color coded wiring diagrams as installed.
- D. Operating Procedures: Contractor shall include start-up, break-in, and routine normal operating instructions and sequences. Contractor shall include regulation, control, stopping, shut-down, and emergency instructions. Contractor shall include summer, winter, and any special operating instructions.
- E. Maintenance Requirements: Contractor shall include routine procedures and guide for trouble-shooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.
- F. Contractor shall provide servicing and lubrication schedule, and list of lubricants required.
- G. Contractor shall include manufacturer's printed operation and maintenance instructions.
- H. Contractor shall include sequence of operation by controls manufacturer.
- I. Contractor shall provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.
- J. Contractor shall provide control diagrams by controls manufacturer as installed.
- K. Contractor shall provide Contractor's coordination drawings, with color coded piping diagrams as installed.
- L. Contractor shall provide charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams.
- M. Contractor shall provide list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.
- N. Additional Requirements: Contractor shall include all additional requirements as specified in Specification(s).
- O. Contractor shall provide a listing in Table of Contents for design data, with tabbed fly sheet and space for insertion of data.

1.07 SUBMITTAL:

- A. Contractor shall submit to the District for review two (2) copies of preliminary draft or proposed formats and outlines of the contents of the Manual within thirty (30) days of Contractor's start of Work.
- B. For equipment, or component parts of equipment put into service during construction and to be operated by District, Contractor shall submit draft content for that portion of the Manual within ten (10) days after acceptance of that equipment or component.

- C. Contractor shall submit two (2) copies of a complete Manual in final form prior to final Application for Payment. Copy will be returned with Architect/Engineer comments. Contractor must revise the content of the Manual as required by District prior to District's approval of Contractor's final Application for Payment.
- D. Contractor must submit two (2) copies of revised Manual in final form within ten (10) days after final inspection.

PART 2 – PRODUCTS Not Used.

PART 3 – EXECUTION Not Used.

END OF DOCUMENT

WARRANTIES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Warranty/Guarantee Information;
- B. Special Conditions.

1.02 FORMAT

- A. Binders: Contractor shall use commercial quality, 8-1/2 by 11 inch, three-side rings, with durable plastic covers; two inch maximum ring size.
- B. Cover: Contractor shall identify each binder with typed or printed title "WARRANTIES" and shall list title of Project.
- C. Table of Contents: Contractor shall provide title of Project; name, address, and telephone number of Contractor and equipment supplier; and name of responsible principal. Contractor shall identify each item with the number and title of the specific Specification, document, provision, or section in which the name of the product or work item is specified.
- D. Contractor shall separate each warranty with index tab sheets keyed to the Table of Contents listing, providing full information and using separate typed sheets as necessary. Contractor shall list each applicable and/or responsible Subcontractor(s), supplier(s), and/or manufacturer(s), with name, address, and telephone number of each responsible principal(s).

1.03 PREPARATION:

- A. Contractor shall obtain warranties, executed in duplicate by each applicable and/or responsible subcontractor(s), supplier(s), and manufacturer(s), within ten (10) days after completion of the applicable item or work. Except for items put into use with District's permission, Contractor shall leave date of beginning of time of warranty blank until the date of completion is determined.
- B. Contractor shall verify that documents are in proper form, contain full information, and are notarized, when required.
- C. Contractor shall co-execute submittals when required.
- D. Contractor shall retain warranties until time specified for submittal.

1.04 TIME OF SUBMITTALS:

- A. For equipment or component parts of equipment put into service during construction with District's permission, Contractor shall submit a draft warranty for that equipment or component within ten (10) days after acceptance of that equipment or component.
- B. Contractor shall submit for District approval all warranties and related documents within ten (10) days after date of completion. Contractor must revise the warranties as required by the District prior to District's approval of Contractor's final Application for Payment.
- C. For items of work delayed beyond date of completion, Contractor shall provide an updated submittal within ten (10) days after acceptance, listing the date of acceptance as start of warranty period.

PART 2 - PRODUCTS Not Used.

PART 3 – EXECUTION Not Used.

END OF DOCUMENT

(Letterhead of Contractor)

STANDARD GUARANTEE / WARRANTY

for

Project Name

Contract No.

We hereby warrant that the Work we have provided under the above reference Contract has been completed in accordance with the Drawings, Specifications, and other Contract Documents.

Under the terms of this warranty, we agree to repair or replace any or all of our work, together with any other adjacent work which may be displaced or damaged by so doing, which may prove to be either patently defective in its workmanship or latently defective in its workmanship or materials within the period of 24 months from the date of filing of the Notice of Completion of the above named Project by the Board of Trustees of the School District, and we also agree to repair any and all damages resulting from such defects, without any expense whatsoever to said Board of Trustees, ordinary wear and tear and unusual abuse or neglect excepted.

In the event of our failure to comply with above-mentioned guarantee conditions within ten (10) day after being notified in writing by the Owner, we collectively and separately do hereby authorize the Owner to have said defective work and damages repaired or replaced and made good at our expense and will honor and pay the costs and charges therefore upon demand.

SIGNED (Contractor) _____

(Address)

(Printed Name of Authorized Representative)

Signature

(License Number)

(Date of Signing)

COUNTERSIGNED (Owner) _____

(Printed Name of Authorized Representative)

Signature

Date of Filing or Notice of Completion: _____

(Letterhead of Company)

SUBCONTRACTOR STANDARD GUARANTEE / WARRANTY

We hereby warrant that

which we have provided in _____

Name of Project

for

District

has been completed in accordance with Specification Section _____ and requirements of the Contract Documents.

Under the terms of this warranty, we agree to repair or replace any or all of our work, together with any other adjacent work which may be displaced or damaged by so doing, which may prove to be either patently defective in its workmanship or latently defective in its workmanship or materials within a period of 24 months from date of filing the Notice of Completion of the above-named Project by the Board of Trustees of the School District without any expense whatsoever to said Board of Trustees, ordinary wear and tear and unusual abuse or neglect excepted.

In the event of our failure to comply with above-mentioned guarantee conditions within ten (10) day after being notified in writing by the Owner, we collectively and separately do hereby authorize the Owner to have said defective work and damages repaired or replaced and made good at our expense and will honor and pay the costs and charges therefore upon demand.

SIGNED (Subcontractor)

(Signature)

(Company Name)

(Address)

(License Number)

(Date of Signing)

COUNTERSIGNED (General Contractor)

(Signature)

(Company Name)

(Address)

(License Number)

(Date of Signing)

(Letterhead of Company)

SPECIAL EXTENDED WRITTEN GUARANTEE / WARRANTY

We hereby warrant that

which we have provided in _____

Name of Project

for _____

District

has been completed in accordance with Specification Section _____ and requirements of the Contract Documents.

Under the terms of this warranty, we agree to repair or replace any or all of our work, together with any other adjacent work which may be displaced or damaged by so doing, which may prove to be either patently defective in its workmanship or latently defective in its workmanship or materials within a period of _____ year(s) from date of filing the Notice of Completion of the above-named Project by the Board of Trustees of the School District without any expense whatsoever to said Board of Trustees, ordinary wear and tear and unusual abuse or neglect excepted. We also agree to repair any and all damages resulting from such defects.

In the event of our failure to comply with above-mentioned conditions within a reasonable time but in no case longer than ten (10) calendar days after being notified in writing by the Owner, we collectively and separately do hereby authorize the Owner to have said defective work and damages repaired or replaced and made good at our expense and will honor and pay the costs and charges therefore upon demand.

SIGNED (Subcontractor)

(Name)

(Address)

(License Number)

(Date of Signing)

COUNTERSIGNED (General Contractor)

(Name)

(Address)

(License Number)

(Date of Signing)

RECORD DOCUMENTS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Documents on Work;
- B. Special Conditions.

PART 2 - RECORD DRAWINGS

2.01 GENERAL:

- A. As indicated in the Contract Documents, the District will provide Contractor with one set of reproducible, full size original Contract Drawings (mylars).
- B. Contractor shall maintain at each Project Site one set of marked-up plans and shall transfer all changes and information to those marked-up plans, as often as required in the Contract Documents, but in no case less than once each month. Contractor shall submit to the Project Inspector one set of reproducible vellums of the Project Record Drawings ("As-Built") showing all changes incorporated into the Work since the preceding monthly submittal. The As-Built shall be available at the Project Site. The Contractor shall submit reproducible vellums at the conclusion of the Project following review of the blue line prints.
- C. Label and date each Record Drawing "RECORD DOCUMENT" in legibly printed letters.
- D. All deviations in construction, including but not limited to pipe and conduit locations and deviations caused by without limitation Change Orders, Construction Claim Directives, RFI's, and Addenda, shall be accurately and legibly recorded by Contractor.
- E. Locations and changes shall be done by Contractor in a neat and legible manner and, where applicable, indicated by drawing a "cloud" around the changed or additional information.

2.02 RECORD DRAWING INFORMATION:

- A. Contractor shall record the following information:
 - (1) Locations of Work buried under or outside each building, including, without limitation, all utilities, plumbing and electrical lines, and conduits.

- (2) Actual numbering of each electrical circuit to match panel schedule.
- (3) Locations of significant Work concealed inside each building whose general locations are changed from those shown on the Contract Drawings.
- (4) Locations of all items, not necessarily concealed, which vary from the Contract Documents.
- (5) Installed location of all cathodic protection anodes.
- (6) Deviations from the sizes, locations, and other features of installations shown in the Contract Documents.
- (7) Locations of underground work, points of connection with existing utilities, changes in direction, valves, manholes, catch basins, capped stubouts, invert elevations, etc.
- (8) Sufficient information to locate Work concealed in each building with reasonable ease and accuracy.

In some instances, this information may be recorded by dimension. In other instances, it may be recorded in relation to the spaces in the building near which it was installed.

- B. Contractor shall provide additional drawings as necessary for clarification.
- C. Contractor shall provide reproducible record drawings, made from final Shop Drawings marked "No Exceptions Taken" or "Approved as Noted."
- D. After review and approval of the marked-up specifications by the Project Inspector, Contractor shall provide electronic copies of the drawings (in PDF format) with one file with all of the sheets and one set of individual sheet files at the conclusion of the Project.

PART 3 - RECORD SPECIFICATIONS

3.01 GENERAL:

- A. Contractor shall mark each section legibly to record manufacturer, trade name, catalog number, and supplier of each Product and item of equipment actually installed.
- B. After review and approval of the marked-up specifications by the Project Inspector, Contractor shall provide one electronic copy of the specifications (in PDF format) at the conclusion of the Project.

PART 4 - MAINTENANCE OF RECORD DOCUMENTS

4.01 GENERAL

- A. Contractor shall store Record Documents apart from documents used for construction as follows:

- (1) Provide files and racks for storage of Record Documents.
- (2) Maintain Record Documents in a clean, dry, legible condition and in good order.

B. Contractor shall not use Record Documents for construction purposes.

PART 5 – PRODUCTS Not Used.

END OF DOCUMENT

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes general requirements and procedures for compliance with California Code of Regulations, Title 24, Part 11 California Green Building Standards Code, "CAL-Green".

- 1. Chapter 5- Non-Residential Mandatory Measures.

1.2 RELATED REQUIREMENTS

- A. Pertinent sections specifying erosion control.
- B. Section 01 6116, Volatile Organic Compound (VOC) Restrictions.
- C. Section 01 7419, Construction Waste Management and Disposal.
- D. Section 01 7700, Closeout Procedures.

1.3 DEFINITIONS

- A. CAL-Green Definitions: Certain terms are defined by CAL-Green in Chapter 5 of the code. Words and terms used in this section shall have the meanings shown therein.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Respond to questions and requests from Architect and the jurisdiction having authority regarding CAL-Green credits that are the responsibility of the Contractor, that depend on product selection or product qualities, or that depend on Contractor's procedures. Document responses as informational submittals.

1.5 SUBMITTALS

- A. CAL-GREEN Submittals: Submit CAL-GREEN submittals required by code and in other Specification Sections.
 - 1. CAL-GREEN submittals are in addition to other submittals. If submitted item is identical to that submitted to comply with other requirements, submit duplicate copies as a separate submittal to verify compliance with indicated CAL-GREEN requirements.
 - 2. Acceptable verification submittals are specified in the related sections.

SUSTAINABLE DESIGN REQUIREMENTS
SECTION 01 8113.10
3595001

PART 2 - PRODUCTS

2.1 REQUIREMENTS - GENERAL

- A. Provide products and procedures necessary to confirm CAL-GREEN compliance required in this Section. Although other Sections may specify some CAL-GREEN requirements, the Contractor shall determine additional materials, techniques, means, methods and procedures necessary to comply with CAL-GREEN requirements.

2.2 STORM WATER POLLUTION PREVENTION PLAN

- A. Section 5.106.1: Comply with requirements of this code section, local ordinances, General Conditions, Special Provisions, and related sections specifying erosion control.

2.3 OUTDOOR WATER USE

- A. Section 5.304.3.1: Irrigation Controllers: Comply with requirements of this code section, local ordinances and Section 32 8000.

2.4 CONSTRUCTION WASTE REDUCTION

- A. Section 5.408 Construction Waste Management, Diversion and Recycling: Comply with requirements of this code section, local ordinances and Section 01 7419.

2.5 BUILDING MAINTENANCE AND OPERATION

- A. Section 5.410.2.5. Documentation and Training: Provide Operations Training as required by these code sections and as specified in Section 01 7700 and Systems Manual as specified in Section 01 7700.

2.6 POLLUTANT CONTROL

- A. Section 5.504.3 Indoor Air Quality: Comply with requirements of this code section, local ordinances and Section 01 3543.
 - 1. During storage, rough installation and until final start-up of HVAC equipment, securely cover all ducts and air distribution component openings with plastic, tape, sheet metal or other methods acceptable to enforcing agency to reduce dust or debris collected in the system.
- B. Section 5.504.4 Finish Material Pollutant Control: All Finish materials shall comply with requirements of this code section, local ordinances and Section 01 6116.

PART 3 - EXECUTION

3.1 GENERAL

- A. Comply with Section 01 7419, Construction Waste Management and Disposal.

SUSTAINABLE DESIGN REQUIREMENTS
SECTION 01 8113.10
3595001

- B. Comply with execution requirements of related sections and applicable local codes and ordinances.

END OF SECTION

*p:\sacramento\3595 tracy unified school district\001-000_villalovoz es new shade structures\08 specifications\06 spec\04 final\freiler
- shade struct\01 8113.10_sustainable design requirements (cal-green).docx
Last Updated: April 8, 2019*

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Code required signage.
 - 2. Exterior building identification and other non-code signage.

1.2 RELATED REQUIREMENTS

- A. Section 01 6116, Volatile Organic Compound (VOC) Restrictions; for VOC limits pertaining to adhesives, sealants, fillers, primers, and coatings.
- B. Section 01 8113, Sustainable Design Requirements, for CAL-Green general requirements and procedures.
- C. Division 26, Electrical.
- D. Signage requirements included on the Drawings.

1.3 REFERENCES AND STANDARDS

- A. California Building Code, edition as noted on the drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CAL Green), edition as noted on drawings, as adopted by the California Division of the State Architect (DSA).
- C. Title 19, CCR, Article 33.01(i).
- D. American National Standards Institute (ANSI):
 - 1. A-117.1: Accessible and Usable Buildings and Facilities.
- E. ASTM International (ASTM):
 - 1. A53/A53M: Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
 - 2. A153/A153M: Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Submittal Procedures:
 - 1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.

SIGNAGE
SECTION 10 1400
3595001

2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
3. Sustainable Design Submittals shall comply with the additional requirement of Section 01 8113, Sustainable Design Requirements.

B. Coordination:

1. Prior to production of shop drawings and samples, coordinate a pre-submittal conference with Architect to confirm submittal requirements, schedule, and sign review process.
2. For signs supported by or anchored to permanent construction, advise installers of anchorage devices about specific requirements for placement of anchorage devices and similar items to be used for attaching signs.

1.5 ACTION SUBMITTALS

A. Shop Drawings:

1. Scaled drawings and signage schedule for each sign indicating materials, lettering layout, and colors.
2. Font Style. 18 point graphical example of alphabet and numerical numbers 0 through 9 of signage font style, upper and lower case letters, punctuation, 18 point scale, and black text on white paper.

B. Product Data: Submit list and complete descriptive data of all products proposed for use. Include manufacturer's specifications, published warranty or guarantee, installation instructions, and maintenance instructions.

C. Samples:

1. Submit three samples of specified signage fonts to be used for visual and tactile characters including braille below the raised characters.
2. Color Verification: Provide physical sample of each available color from the manufacturer. Include color system name and serial number, code and name as applicable.
3. Control Samples. Samples shall be prepared on same base material to be used in fabrication. Submit one sample of each sign type. Signage types are indicated in Construction Document details. Interior signs shall be full size.
4. Dimensional Letters: One full-size representative samples of each dimensional letter type required, showing letter style, color, and material finish and method of attachment.
5. Symbol of Accessibility and Pictograms. Full scale sample of pictograms and symbol of accessibility to be used on sign panels and graphics.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For installer.

B. Sustainable Design:

1. General:
 - a. Submit information necessary to establish and document compliance with the California Green Building Standards Code.
 - b. Sustainable design submittals are in addition to other submittals.
 2. The following information shall be provided:
 - a. Adhesives and Sealants: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.
- C. Sample of manufacturer's warranty.
- D. Signage Schedule and Alphanumeric Nomenclature. As a component of shop drawings and informational submittals, verify with Architect the sign nomenclature; room names and numbers; wording of way-finding, directional and informational signage; text; and orientation of wayfinding pictorial graphics.

1.7 CLOSEOUT SUBMITTALS

- A. Warranty/Guarantee: Submit executed warranty and Subcontractor's guarantee.
- B. Maintenance data for signs and sign types including maintenance manuals.

1.8 QUALITY ASSURANCE

- A. Contractor shall assure that the vendor shall be responsible for the quality of materials and workmanship of any firm acting as the vendor's subcontractor.
- B. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.
- C. Use materials and products of one manufacturer whenever possible.
- D. Materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.
- E. The adhesion of inlaid letters and symbols will be tested. See Article WARRANTY.

1.9 DELIVERY, STORAGE AND HANDLING

- A. Deliver undamaged products to job in manufacturer's sealed containers and/or original bundles with tags and labels intact.
- B. Store materials in protected, dry conditions off of ground and in areas so as to not interfere with the progress of the work.
- C. Transport, store and handle in strict accord with the manufacturer's written recommendations.

SIGNAGE
SECTION 10 1400
3595001

1.10 FIELD MEASUREMENTS

- A. Make and be responsible for all field dimensions necessary for proper fitting and completion of work. Report discrepancies to Architect before proceeding.

1.11 WARRANTY

- A. Manufacturer: In addition to the Contractor's and Subcontractor's Guarantee, furnish Owner with manufacturer's available fully executed written warranty for signage against all defects in materials and workmanship, including without limitation against yellowing, cracking, crazing, and other visible and performance defects for a period of 5 years.
 - 1. Text, pictograms or symbols that can be removed from the sign face utilizing a sharp object or other conventional methods will be considered a manufacturing defect.

PART 2 - PRODUCTS

2.1 DESIGN AND PERFORMANCE CRITERIA

- A. Regulatory Standards:
 - 1. Except as otherwise specified or shown, signage shall conform to the following:
 - a. ANSI A-117.1 and the Americans with Disabilities Act (ADA).
 - b. ATBCB Design Guidelines for Signage in relation to the Americans with Disabilities Act.
 - c. California Code of Regulations, Titles 19 and 24.
 - 1) Contracted Grade 2 Braille shall be used whenever Braille symbols are specifically required. Refer to CBC Section 11B-703.3.
 - 2) All signage shall conform to CBC Section 11B-703.
 - d. Uniform Sign Code.
 - 2. When there is a conflict between the CBC and ADA, comply with the most stringent.
- B. Design Criteria: Refer to Chapter 11B of the California Building Code.
 - 1. Raised Characters: Section 11B-703.2.
 - a. Depth: Section 11B-703.2.1.
 - b. Case: Section 11B-703.2.2.
 - c. Style: Section 11B-703.2.3.
 - d. Character Proportions: Section 11B703.2.4.
 - e. Character Height: Section 11B-703.2.5.
 - f. Stroke Thickness: Section 11B-703.2.6.
 - g. Character Spacing: Section 11B-703.2.7.
 - h. Line Spacing: Section 11B-703.2.8.

- i. Installation Height and Location: Section 11B-703.4.
 - 2. Braille: Section 11B-703.3.
 - a. Contracted (Grade 2) Braille with rounded or domed dots shall be used wherever Braille is required.
 - 1) Braille dimensions in accordance with Table 11B-703.3.1.
 - 3. Visual Characters: Section 11B-703.5.
 - a. Character Proportions: Section 11B-703.5.4.
 - b. Stroke Thickness: Section 11B-703.5.7.
 - c. Character Spacing: Section 11B-703.5.8.
 - d. Line Spacing: Section 11B-703.5.9.
 - 4. Pictograms: Section 11B-703.6.
 - a. Pictogram Field: 11B-703.6.1.
 - 1) Characters and Braille shall not be located in the pictogram field.
 - b. Finish and Contrast: Section 11B-703.6.2.
 - 1) Pictograms and their field shall have a non-glare finish. Pictograms shall contrast with their field with either a light pictogram on a dark field or a dark pictogram on a light field.
 - c. Text Descriptors: Section 11B-703.6.3.
 - 1) Locate text descriptors directly below the pictogram field.
 - 2) Text shall be raised characters with braille directly below.
 - 5. International Symbol of Accessibility: Section 11B-703.7.2.1.
 - 6. Toilet Room Door Symbols: Section 11B-703.7.2.6.
 - 7. Tactile Exit Signs: Tactile exit signage to comply with 1013.4 and 11B-703.4.
- C. Sustainable Design:
- 1. VOC emissions for field-applied adhesives, sealants, and sealant primers must comply with limits specified in Section 01 6116.

2.2 PLASTIC SIGNS - TACTILE

- A. Materials, Unless Otherwise Noted:
- 1. Manufacturer and Product: "Inlaid Tactile Sign" by Accent Signage Systems, Inc. Minneapolis, MN, 800-215-9437 as specified and the basis of design; Ellis & Ellis Sign Systems, Sacramento, CA, 916-924-1936; ASI-Modulux, Los Altos, CA, 650-940-1354; Weidner Architectural Signage, Sacramento, CA; or equal.
 - a. Sign Face: Two 1/8-inch plies with eased edges; New Hermes "Gravo-Tac," or equal.
 - 1) Total Thickness: 1/4 inch.
 - 2) Painted signs will not be accepted.
 - b. Tactile Text: Provide tactile text and "Raster" Braille at plastic tactile signage.

SIGNAGE
SECTION 10 1400
3595001

- 1) Tactile text shall be inlaid into sign face 1/32-inch and raised 1/32- inch minimum above sign face surface.
- 2) Inlaid text shall be 1-ply, 1/16-inch thick material; "Gravo-Tac" Exterior or equal.
- 3) Provide text and graphics precisely formed, uniformly opaque to comply with relevant ADA regulations and requirements indicated for size, style, spacing, content, position and colors.
- 4) Symbols where specified shall be International Style.
- 5) Braille shall be Contracted (Grade 2) Braille.
 - a) Dots shall be 0.10-inch on centers in each cell, 0.30-inch on center between corresponding dots in adjacent cells, and 0.395-inch minimum to 0.400-inch maximum on center between corresponding dots in cell directly below.
 - b) Dots shall be raised a minimum of 0.025-inch and a maximum of 0.037-inch above the background, and a base diameter of 0.059-inch minimum and 0.063- inch maximum.
 - c) Dots with straight sides and flat tops are not acceptable.
- c. Colors: High contrast, non-glare, integral colors for graphics.
 - 1) Integral materials shall be U.V. stabilized.
 - 2) Characters, symbols and pictograms shall be in high contrast (light color) with background (dark) color and must conform to the CBC and the ADA Standards.

B. Fabrication:

1. Panel Appearance: Manufacturer's standard, high contrast, semi-matte colors.
2. Surface Texture: Matte Non-glare.
3. Character Style, Size and Layout Position:
 - a. Characters shall be 1-inch high, unless otherwise indicated.
 - b. The stroke of the uppercase letter "I" shall be 15 percent maximum of the height of the character.
 - c. The width of the uppercase letter "O" shall be 60 percent minimum and 110 percent maximum of the height of the uppercase letter "I".
 - d. Character style to be Sans Serif, uppercase, accompanied by Braille directly below text at all locations where raised characters are required.
 - e. Spacing between baselines of separate lines of raised characters with a message shall be 135 percent minimum and 170 percent maximum of the raised character height.
4. Text Schedule: Confirm text, symbols and numbering with the Architect and Owner.
5. Sign Size: As indicated on the Drawings or, if not shown, as reasonably required to accommodate text, symbols and Braille.
 - a. Where signs are installed on window glazing, fabricate a blank sign back to match in size and shape to sign.

- b. Sign backs shall cover back side of sign from view through window on opposite side of sign.
 - c. Signs that are mounted back-to-back on glazing are to be matching in size; the smaller sign is to be increased in size as reasonably required to match the larger sign.
- 6. Sign Shape: As indicated on the Drawings.
 - a. Corners: Radius, unless otherwise shown.
- 7. Inlaid Letter Adhesion Process: Inlaid material shall be adhered into 1/32-inch deep routed sign face utilizing the heat and pressure bonded/chemically welded process as developed by Accent Signage Systems for the specified "Inlaid Tactile Sign."
 - a. Sign manufacturers for the specified "Inlaid Tactile Sign" shall be familiar with and utilize the exact same manufacturing process developed by Accent Signage Systems.
 - b. Manufacturer must utilize the same and required equipment, products and techniques necessary to produce authentic "Inlaid Tactile Signs" as developed by Accent Signage Systems.
 - c. Other adhesive products and methods, including applied adhesive tapes will not be accepted.
- C. Sign Types: Provide braille translation directly below the raised characters.
 - 1. Room Identification Sign: Provide as shown on the Drawings.
 - a. Provide name and room number at each door indicated.
 - b. Names and numbers to be reviewed and approved by Architect and Owner prior to fabrication.
 - c. Allow an average of 4-numbers and 14-letters for each sign.
 - d. Sign to be provided adjacent to doors as shown.
 - 2. Toilet Room Identification Sign: In addition to the specified Door Symbol, provide a Toilet Room Identification Sign at the strike side of every toilet room door.
 - a. Sign shall include an International Symbol of Accessibility, pictogram, and raised characters, specifying the room name with Braille translation below pictogram.
 - 3. Tactile Exit Sign
 - a. Provide with text in raised characters to read: "EXIT".

2.3 PLASTIC SIGNS - NON-TACTILE

A. Materials, Unless Otherwise Noted:

Manufacturer and Product: Acrylic panel sign as manufactured and distributed by Ellis & Ellis Sign Systems, 916-924-1936, as specified and the basis of design, or equal.

- 1. Sign Face: 1/4-inch, matt finish, non-glare acrylic with subsurface vinyl and paint. Painted faces will not be accepted.
- 2. Colors: Colors shall match specified Tactile Signs and as selected by Architect and Owner.

SIGNAGE
SECTION 10 1400
3595001

- a. Integral materials shall be U.V. stabilized.
- b. Graphics and text shall be in high contrast (light color) with background (dark) color.

B. Fabrication:

- 1. Sign Thickness: 1/4-inch.
- 2. Character Style, Size and Layout Position:
 - a. Characters shall be a minimum of 1-inch high, unless otherwise indicated.
 - b. The stroke thickness of the uppercase letter "I" shall be 10 percent minimum and 20 percent maximum of the height of the character.
 - c. The width of the uppercase letter "O" shall be 60 percent minimum and 110 percent maximum of the height of the uppercase letter "I".
 - d. Letter style to be Sans Serif, uppercase.
 - e. Space characters 10 percent minimum and 35 percent maximum of height of characters, measured between two closest points of adjacent characters, excluding word spaces.
 - f. Spacing between baselines of separate lines of characters within a message shall be 135 percent minimum and 170 percent maximum of character height.
- 3. Text Schedule: Confirm text, symbols and numbering Architect and Owner using the shop drawing/submittal process.
- 4. Sign Size: As indicated on the Drawings or, if not shown, as reasonably required to accommodate text and symbols.
 - a. Where signs are installed on window glazing, fabricate a blank sign back to match in size and shape to sign.
 - b. Sign backs will cover back side of sign from view through window on opposite side of sign.
- 5. Sign Shape: As indicated on the Drawings or, as reasonably required to accommodate the specified text and size at lettering.
 - a. Corners: 1/4-inch radius, unless otherwise shown.

C. Sign Types:

- 1. Toilet Room Door Symbol: Provide one of the following symbols as appropriate to the toilet room type. Toilet Room Door Symbols shall have a color contrast that is distinctly different from the color of the door. Characters, as shown, to be flush with face of symbol. The entire background color must contrast with door. A thin contrasting border around the symbol, with remainder of sign background in a non-contrasting color is not allowed.
 - a. Girls: 12-inch diameter circle, with eased edges.
 - b. Boys: Equilateral triangle with sides 12-inches long, with eased edges.
 - c. Women: 12-inch diameter circle, with eased edges.
 - d. Men: Equilateral triangle with sides 12-inches long, with eased edges.

- e. Unisex or Staff: equilateral triangle of contrasting color and super imposed on and geometrically inscribed within the face of 12-inch diameter circle, which is a contrasting color to the door. The vertices of the triangle symbol shall be located 1/4-inch maximum from the edge of the circle with the vertex pointing upward. Both the circle and triangle to have eased edges.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Prior to installation, carefully inspect and verify that the installed work of other trades is complete to the point where this installation may properly commence.
- B. Verify that specified items may be installed in accordance with the approved design.
- C. In the event of discrepancy, immediately notify Architect. Do not proceed in discrepant areas until discrepancies have been fully resolved.

3.2 INSTALLATION OF SIGNS

- A. General: Locations of signs must be in accordance with the Drawings and approved shop drawings.
- B. Plastic Signs:
 - 1. General:
 - a. Provide both mechanical fasteners and either adhesive or 2-sided adhesive tape as recommended by manufacturer for given mounting substrate.
 - b. Fasteners: Minimum 4-recessed flush head tamper-proof (vandal-resistant) screws per sign.
 - 2. Wood Framed Walls: Mechanical fasteners shall be of adequate length to penetrate exterior finishes and provide secure embedment into wall structure or sheathing.

3.3 PROTECTION

- A. Protect work and materials of this Section and other Sections prior to and during installation, and protect the installed work and materials of all other trades.
- B. In the event of damage, immediately make all repairs and replacements necessary to the approval of the Architect and at no additional cost to the Owner.

SIGNAGE
SECTION 10 1400
3595001

3.4 ADJUSTING AND CLEANING

- A. Remove all dust, dirt, finger marks, etc. from signs and letters using cleaning methods as recommended by manufacturer.

END OF SECTION

*p:\sacramento\3595 tracy unified school district\001-000_villalovoz es new shade structures\08 specifications\06 spec\04 final\freiler
- shade struct\10 1400_ signage.docx
Last Updated: March 30, 2021*

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Toilet accessories.

1.2 RELATED REQUIREMENTS

- A. Section 10 2113, Plastic Toilet Compartments.
- B. Division 26, Electrical.

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the state Architect (DSA).
- B. California Green Building Standards Code (CAL Green), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Submittal Procedures:
 - 1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
 - 2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
- B. Coordination: Coordinate with other trades as required to ensure proper and adequate provision in framing and wall finish for the installation of the selected toilet accessories in the locations required including recessed items)

1.5 ACTION SUBMITTALS

- A. Shop Drawings: Submit showing parts, connections and anchorages, adjacent materials, fully dimensioned and noted.
- B. Product Data: Submit list of each required accessory and complete descriptive data of products proposed for use. Include manufacturer's specifications, published warranty, installation instructions, and maintenance instructions.

1.6 INFORMATIONAL SUBMITTALS

- A. Sample of manufacturer's warranty.

TOILET ACCESSORIES
SECTION 10 2813
3595001

1.7 CLOSEOUT SUBMITTALS

- A. Warranty/Guarantee: Submit executed warranty and Subcontractor's guarantee.
- B. Keys for lockable accessories.
- C. Maintenance data and operating instructions.

1.8 QUALITY ASSURANCE

- A. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.
- B. Use materials and products of one manufacturer whenever possible.
- C. All materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.

1.9 DELIVERY, STORAGE AND HANDLING

- A. Deliver undamaged products to job in manufacturer's sealed containers and/or original bundles with tags and labels intact.
- B. Store materials in protected, dry conditions off of ground and in areas so as to not interfere with the progress of the Work.
- C. Transport, store and handle in strict accord with the manufacturer's written recommendations.

1.10 FIELD CONDITIONS

- A. Make and be responsible for field dimensions necessary for proper fitting and completion of Work. Report discrepancies to Architect before proceeding.
- B. Verify wall depths are adequate for each item prior to ordering. Notify Architect of conflicts or discrepancies.

1.11 WARRANTY

- A. Manufacturer: In addition to the Contractor's and Subcontractor's Guarantee, furnish Owner with manufacturer's fully executed written warranty for toilet accessories against defects in materials and workmanship, agreeing to replace and install toilet accessories at no additional cost to the Owner, within warranty period as follows:
 - 1. For a period of 3 years.

PART 2 - PRODUCTS

2.1 OWNER FURNISHED CONTRACTOR INSTALLED PRODUCTS

- A. The following products will be furnished by the Owner for installation by Contractor. Provide adequate blocking for attachment. Miscellaneous items are to be provided and installed by Contractor.
 - 1. Paper Towel Dispensers.
 - 2. Surface-Mounted Toilet Seat Cover Dispensers.
 - 3. Liquid Soap Dispensers.

2.2 DESIGN AND PERFORMANCE CRITERIA

- A. Conform to applicable requirements of ADA and CBC for accessibility. When in conflict, conform to the most stringent.

2.3 MANUFACTURERS

- A. Accessories: Bobrick Washroom Equipment Inc. or Bradley Corporation as specified and the basis of design, unless otherwise noted, or equal.
 - 1. Manufactured accessories not specified shall require approval as a substitution to be considered equal. Refer to substitution requirements specified in Section 01 3300, Submittal Procedures.
 - 2. Although multiple manufacturers may be specified for a specific accessory, all accessories shall be the product of a single manufacturer, unless otherwise specified or approved.

2.4 MANUFACTURED UNITS

- A. Recessed Toilet Paper Dispenser at Disabled Accessible Locations: Multi-roll; Bobrick B-3888.
- B. Sanitary Napkin/Tampon Dispenser: Coin free operation. Provide semi-recessed unit except where obstruction precludes recessing.
 - 1. Surface-Mounted: Bobrick B-2706C.
- C. Sanitary Napkin Disposal:
 - 1. Surface Mounted for Single Compartment: Bobrick B-270, Bradley 4781-11.
 - 2. Partition Mounted for Two Toilet Compartments: Bobrick B-354, Bradley 4721-15.

2.5 FASTENINGS

- A. Toilet accessories shall be complete with required fastenings.
- B. Fastenings shall either harmonize with the item being fastened, or be of the concealed type.

TOILET ACCESSORIES
SECTION 10 2813
3595001

- C. Exposed fastenings shall be theft and vandal-resistant.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Prior to installation of the Work of this Section, carefully inspect and verify that the installed Work of other trades is complete to the point where this installation may properly commence.
- B. Verify that specified items may be installed in accordance with the approved design.
- C. In the event of discrepancy, immediately notify the Architect. Do not proceed in discrepant areas until discrepancies have been fully resolved.

3.2 PREPARATION

- A. The Contractor shall provide recesses, anchorage and back-up blocking in sizes and in locations as required for proper installation of accessories. Coordinate with other trades where necessary to make provisions for installation.
- B. Securely anchor items in place in locations and at mounting heights indicated. Where specific dimensions are not noted, installation shall be approved by the Architect.
- C. Securely fasten grab bar mounting plates to solid framing or blocking, in accordance with CBC.
- D. Provide cut-outs in toilet partitions for napkin disposal units as required.

3.3 INSTALLATION

- A. Install fixtures, accessories and items in accordance with manufacturers' printed instructions where shown or as approved by Architect.
- B. Mount surface-mounted accessories to solid backing or blocking.
- C. Install plumb and level, securely and rigidly anchored to substrate.
- D. Use concealed vandal-resistant fastenings wherever possible.
 - 1. Adhesive installation not permitted.
 - 2. Provide anchors, bolts and other necessary fasteners, and attach accessories securely to walls or toilet partitions as recommended by manufacturer for each item and each type of substrate condition.
- E. Verify type, location and attachment methods of items furnished by Owner to ensure proper preparation of substrate for solid attachment of accessories.
- F. Sealants: Comply with requirements of Section 07 9200, Joint Sealants.

1. Apply behind toilet accessories as necessary to ensure sanitary and watertight integrity of surfaces.
2. Conceal sealants.

3.4 CLEANING AND ADJUSTING

- A. Upon completion of installation, remove manufacturer's temporary labels, marks of identification.
- B. Thoroughly wash surfaces, remove foreign materials, polish surfaces.
- C. Leave entire accessories in neat, orderly, clean, acceptable condition as approved.
- D. Replace damaged parts, surfaces which are not free from imperfections.

3.5 PROTECTION

- A. Protect Work and materials of this Section prior to and during installation, and protect the installed Work and materials of other trades.
- B. In the event of damage, make repairs and replacements necessary to the approval of the Architect at no additional cost to the Owner.
- C. Exposed finish shall be free from scratches, dents, permanent discolorations and other defects in workmanship or material.

END OF SECTION

p:\sacramento\3595 tracy unified school district\001-000_villalovoz es new shade structures\08 specifications\06 spec\04 final\freiler - shade struct\10 2813_toilet accessories.docx
Last Updated: April 1, 2021

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Engineered fill materials.
 - 2. Imported engineered fill material.
 - 3. Landscape backfill material'
 - 4. Decomposed granite.
 - 5. Aggregate base.

1.2 RELATED REQUIREMENTS

- A. Section 01 5000, Temporary Facilities and Controls.
- B. Section 01 8113, Sustainable Design Requirements, for CAL-Green **[and Collaborative for High Performance Schools (CHPS)]** general requirements and procedures.
- C. Section 31 2333, Trenching and Backfilling.
- D. Section 32 1200, Asphalt Concrete Paving.
- E. Section 32 1600, Site Concrete.
- F. Section 33 0000, Utilities
- G. Section 33 4000, Storm Drainage Utilities.

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CAL Green), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- C. Local Jurisdiction: Any work within the street, highway or right-of-way shall be performed in accordance with the requirement of the governmental agencies having jurisdiction, and shall not begin until all of those governing authorities have been notified.
- D. ASTM International (ASTM):
 - 1. D698-00 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures, Using 5.5 lb (2.49 Kg) Rammer and 12 inch (304.8 mm) Drop.
 - 2. D1556-00 - Test Method for Density of Soil in Place by the Sand-Cone Method.
 - 3. D1557-02e2 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 10 lb. (4.54 Kg) Rammer and 18 inch (457 mm) Drop.

EARTHWORK
SECTION 31 0000
3595001

4. D3017-05 Test Methods for Moisture Content of Soils and Soil-Aggregate Mixture by Nuclear Methods (Shallow Depth).
5. D422-63(2007) e1 Test Method for Particle Size Analysis of Soil.
6. D4318-05 Test Method for Liquid Limit, Plastic Limit, and Plasticity Limit.

E. CALTRANS Standard Specifications Section 17.

F. CAL-OSHA, Title 8, Section 1590 (e).

1.4 ADMINISTRATION REQUIREMENTS

A. Submittal Procedures:

1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
3. Sustainable Design Submittals shall comply with the additional requirements of Section 01 8113, Sustainable Design Requirements.

B. Site Visitation: All bidders interfacing with existing conditions shall visit the site prior to bid to verify general conditions of improvements. Discrepancies must be reported prior to the bid for clarification.

1.5 ACTION SUBMITTALS

A. Provide supplier's descriptive literature for all products to demonstrate compliance with specified attributes.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Contractor / Installer.

1.7 CLOSEOUT SUBMITTALS

A. Guarantee: Submit subcontractor's guarantee.

1.8 QUALITY ASSURANCE

- A. Contractor / Installer shall have been in business for five (5) years providing/finishing similar size projects and complexity.
- B. Contractor shall be solely responsible for all subgrades built. Failures resulting from inadequate compaction or moisture content are the responsibility of the contractor. Contractor shall be solely responsible for any and all repairs.
- C. The representatives of the Owner's testing lab will not act as supervisor of construction, nor will they direct construction operations. Neither the presence of the Owner's testing lab representatives nor the testing by the Owner's testing lab shall excuse the contractors or subcontractors for defects discovered in their work during or following completion of

the project. Correcting of inadequate compaction or moisture content is the sole responsibility of the contractor.

- D. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.
- E. All materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.
- F. Tests (See Part 3, Article "Testing and Observation" for Compaction Testing).

1.9 DELIVERY, STORAGE AND HANDLING

- A. Transport, store and handle in strict accord with the local jurisdiction.

1.10 FIELD CONDITIONS

1.11 EXISTING SITE CONDITIONS

- A. Contractor shall acquaint himself with all site conditions. If unknown active utilities are encountered during work, notify Architect promptly for instructions. Failure to notify will make Contractor liable for damage to these utilities arising from Contractor's operations subsequent to discovery of such unknown active utilities.
- B. Existing civil, mechanical and electrical improvements are shown on respective site plans to the extent known. Should the Contractor encounter any deviation between actual conditions and those shown, he is to immediately notify the Architect before continuing work.

1.12 ON SITE UTILITY VERIFICATION AND REPAIR PROCEDURES

- A. Ground-breaking requirements:
 - 1. All underground work performed by a Contractor must be authorized by the District's Construction Manager or the Low Voltage Consultant prior to start of construction.
 - 2. The Contractor is to obtain and keep the original School's construction utility site plans on site during all excavation operations. Contractor can contact the District's Construction Manager, Facilities Manager, or the Low Voltage Consultant to procure the drawings.
- B. Underground Utility Locating:
 - 1. The contractor shall hire an Underground Utility Locating Service to locate existing underground utility pathways in areas effected by the scope of work for excavation.
 - 2. Contractor must use an underground utility locator service with a minimum of 3 years experience. The equipment operator must have demonstrated experience. Contact Norcal Underground Locating (800/986-6722) or Precision Locating (800/577-7324)

EARTHWORK
SECTION 31 0000
3595001

3. The Underground Utility Locator Service must have the use of equipment with the ability to locate by means of inductive clamping, induction, inductive metal detection, conductive coupling, or TransOnde (Radiodetection) to generate signals, passive locating (free scoping) for "hot" electric, and metal detector.
4. The Underground Utility Locator Service must be able to locate existing utilities at a depth of at least 72".
5. The Underground Utility Locator Service must be able to locate but are not limited to locating the following types of utility pathways:
 - a. All conduit pathways containing 110 volt or greater 50-60Hz electrical wire.
 - b. All conduit pathways containing an active cable TV system.
 - c. All conduit pathways containing wire or conductor in which a signal can be attached and generated without damaging or triggering the existing systems.
 - d. All empty conduit pathways or pipe in which a signal probe or sonde (miniature transmitter) can be inserted.
 - e. All conduit pathways containing non-conductive cables or wires in which a signal probe or sonde (miniature transmitter) can be inserted.
 - f. All plastic and other nonconductive water lines in which a TransOnde Radiodetection) or other "transmitter" can be applied to create a low frequency pressure wave (signal) without damaging or triggering the existing systems.
 - g. All copper or steel waterlines and plastic or steel gas lines.
6. All markings made by the Underground Utility Locator Service or other shall be clear and visible.
7. The contractor shall maintain all markings made by Underground Utility Locator Service or other throughout the entire length of the project.
8. The Underground Utility Locator Service shall provide the contractor with two sets of maps showing the location of utilities and average depth. They will be referenced to permanent buildings. Contractor will deliver one copy to the district at no additional charge.
9. Contractor is responsible to contact Underground Service Alert (U.S.A. 800/227-2600) and receive clearance prior to any excavation operations.
10. Contractor shall inform the (District's Construction Manager)(Architect)(Owner) no later than five (5) days prior to the date scheduled for the utility locator service to be on site.

1.13 PROTECTION

- A. Adequate protection measures shall be provided to protect workmen and passers-by on and off the site. Adjacent property shall be fully protected throughout the operations. Blasting will not be permitted. Prevent damage to adjoining improvements and properties both above and below grade. Restore such improvements to original condition should damage occur. Replace trees and shrubs outside building area disturbed by operations.
- B. In accordance with generally accepted construction practices, the Contractor shall be solely and completely responsible for working conditions at the job site, including safety

of all persons and property during performance of the work. This requirement shall apply continuously and shall not be limited to normal working hours.

- C. Any construction review of the Contractor's performance conducted by the Geotechnical Engineer is not intended to include review of the adequacy of the Contractor's safety measures, in, on, or near the construction site.
- D. Provide shoring, sheeting, sheet piles and or bracing to prevent caving, erosion or gullyng of sides of excavation.
- E. Surface Drainage: Provide for surface drainage during period of construction in manner to avoid creating nuisance to adjacent areas. The contractor shall make a reasonable effort on a daily basis to keep all excavations and the site free from water during entire progress of work, regardless of cause, source, or nature of water.
- F. Adjacent streets and sidewalks shall be kept free of mud, dirt or similar nuisances resulting from earthwork operations.
- G. The site and adjacent influenced areas shall be watered as required to suppress dust nuisance. Dust control measures shall be in accordance with the local jurisdiction.
- H. Trees: Carefully protect existing trees that are to remain. Provide temporary irrigation as necessary to maintain health of trees.

1.14 SEASONAL LIMITS

- A. No fill material shall be placed, spread or rolled during unfavorable weather conditions. When work is interrupted by rains, fill operations shall not be resumed until field tests indicate that moisture content and density of fill are satisfactory.
- B. Excessively wet fill material shall be bladed and aerated per Article "Subgrade Preparation".

1.15 TESTING

- A. General: Refer to Section 01 4523 - TESTING AND INSPECTION SERVICES, AND STRUCTURAL TESTS AND INSPECTIONS LIST, DSA-103.
- B. Geotechnical Engineer: Owner is retaining a Geotechnical Engineer to determine compliance of fill with Specifications, and to direct adjustments in fill operations. Costs of Geotechnical Engineer will be borne by Owner; except those costs incurred for re-tests or re-inspection will be paid by Owner and backcharged to Contractor.
 - 1. If Contractor elects to process or mine onsite materials for use as Suitable Fill, Aggregate Sub Base, Aggregate Base, Rock, Crushed Rock or sand the cost of all testing of this material shall be paid for by the Contractor.
 - 2. Testing of import fill for compliance with Department of Toxic Substance Control (DTSC) shall be paid for by the Contractor.

**EARTHWORK
SECTION 31 0000
3595001**

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Engineered Fill Materials: All fill shall be of approved local materials supplemented by imported fill if necessary. "Approved" local materials are defined as local soils tested and approved by Geotechnical Engineer free from debris, and concentrations of clay and organics; and contain rocks no larger than 3-inches in greatest dimension. The soil and rock should be thoroughly blended so that all rock is surrounded by soil. This may require mixing of the soil and rock with a dozer prior to placement and compaction. Clods, rocks, hard lumps or cobbles exceeding 3-inches in final size shall not be allowed in the upper 6 inches of any fill. Native clay or clayey soils will not be permitted within the upper 12 inches of building pad areas or paved areas.
- B. Imported Engineered Fill Material: Imported fill may be required to complete work. Proposed import fill material shall meet the above requirements; shall be similar to the native soils. Import fill shall meet the above requirements; shall have plasticity index of 20 or less; an Expansion Index of 15 or less; be free of particles greater than 3-inch (3") in largest dimension; be free of contaminants and have corrosion characteristics within the acceptable limits. All import fill material shall be tested and approved by Soils Engineer prior to transportation to the site. Proposed fill material shall comply with DTSC guidelines to include Phase 1 environmental site assessment and related tests. Refer to the October 2001 DTSC Information Advisory for clean imported fill material.
1. DTSC TESTING: Site work contractor is to coordinate testing with an analytical lab, hired by the owner, licensed by the State of California for the DTSC testing. The costs associated with testing will be paid by the contractor.
 2. DTSC testing shall include documentation as to the previous land use, location, and history. Soils shall be analyzed for all compounds of concern to ensure the imported soil is uncontaminated and acceptable. Testing shall be performed per the recommendations included in DTSC Imported Fill Advisory (http://www.dtsc.ca.gov/Schools/upload/SMP_FS_Cleanfill-Schools.pdf). Soils shall be tested prior to import to the project site.
 3. Lab shall determine geographically which tests and analysis comparison will be appropriate for the testing. (CAM 17 / Title 22); (RWQCB) Regional Water Quality Control Board; or (OEHHA) Office of Environmental Health Hazard Assessment.
 4. Frequency of testing shall be conducted in accordance with DTSC's Imported Fill Advisory as follows;

Fill Material Sample Schedule	
Area Of Individual Borrow Area	Sampling Requirements
2 Acres or less	Minimum of 4 samples
2 to 4 Acres	Minimum of 1 sample every ½ acre
4 to 10 Acres	Minimum of 8 samples

**EARTHWORK
SECTION 31 0000
3595001**

Greater than 10 Acres	Minimum of 8 locations with 4 subsamples per location
-----------------------	---

Volume of Borrow Area Stockpile	
Up to 1,000 Cubic Yards	1 sample per 250 cubic yards
1,000 to 5,000 Cubic Yards	4 samples for the first 1000 cubic yards + 1 sample per each additional 500 cubic yards
Greater than 5,000 Cubic Yards	12 samples for the first 5,000 cubic yards + 1 sample per each additional 1,000 cubic yards

5. Reports/ Documentation
 - a. Results of the testing analysis shall be sent to the Owner; Architect; Project Inspector, Project Civil Engineer, DTSC, and DSA. Letter shall reference DSA file and application numbers.
- C. Landscape Backfill Material:
 1. The top 3" of native topsoil stripped from the site may be used for landscape backfill material.
- D. Water: Furnish all required water for construction purposes, including compaction and dust control. Water shall be potable.
- E. Aggregate Base: Provide Class 2 3/4" Aggregate Base conforming to standard gradation as specified in Cal Trans Standard Specifications, Section 26,-1.02A.
- F. Decomposed Granite: Decomposed Granite shall be well graded mixture of fine to 1/8" particles in size with no clods. The material shall be free of vegetation, other soils, debris and rock. The material shall be redish-tan to tan in color.
- G. Decomposed Granite Solidifier: PolyPavement or equal.

PART 3 - EXECUTION

3.1 INSPECTION LAYOUT AND PREPARATION

- A. Prior to installation of the work of this Section, carefully inspect and verify by field measurements that installed work of all other trades is complete to the point were this installation may properly commence
- B. Layout all work, establish grades, locate existing underground utilities, set markers and stakes, setup and maintain barricades and protection facilities; all prior to beginning

**EARTHWORK
SECTION 31 0000
3595001**

actual earthwork operations. Layout and staking shall be done by a licensed Land Surveyor or Professional Civil Engineer.

- C. Verify that specified items may be installed in accordance with the approved design.
- D. In event of discrepancy, immediately notify Owner and the Architect. Do not proceed in discrepant areas until discrepancies have been fully resolved.

3.2 PERFORMANCE

A. GENERAL:

- 1. General: Do all grading, excavating and cutting necessary to conform finish grade and contours as shown. All cuts shall be made to true surface of subgrade.
- 2. Archaeological Artifacts: Should any artifacts of possible historic interest be encountered during earthwork operations, halt all work in area of discovery and immediately contact the Architect for notification of appropriate authorities.
- 3. Degree of Compaction: Percentage of maximum density, hereinafter specified as degree of compaction required, means density equivalent to that percentage of maximum dry density determined by ASTM D1557 Compaction Test method, and such expressed percentage thereof will be minimum acceptable compaction for specified work.
- 4. Moisture Content: Moisture content shall be as noted below and as called for on the plans. Moisture content shall be maintained until subgrade is covered by surfacing materials.

3.3 DEMOLITION, DISPOSAL AND DISPOSITION OF UNDESIRABLE MAN-MADE FEATURES

- A. All other obstructions, such as abandoned utility lines, septic tanks, concrete foundations, and the like shall be removed from site. Excavations resulting from these removal activities shall be cleaned of all loose materials, dish shaped, and widened as necessary to permit access for compaction equipment. Areas exposed by any required over-excavation should be scarified to a depth of 12", moisture-conditioned to near optimum moisture content, and recompacted to at least 95% of the maximum dry density.

3.4 TESTING AND OBSERVATION

- A. All grading and earthwork operations shall be observed by the Geotechnical Engineer or his representative, serving as the representative of the Owner.
- B. Field compaction tests shall be made by the Geotechnical Engineer or his representative. If moisture content and/or compaction are not satisfactory, Contractor will be required to change equipment or procedure or both, as required to obtain specified moisture or compaction. Notify Geotechnical Engineer at least 48 hours in advance of any filling operation.
- C. Earthwork shall not be performed without the notification or approval of the Geotechnical Engineer or his representative. The Contractor shall notify the Geotechnical Engineer at least two (2) working days prior to commencement of any aspect of the site earthwork.

- D. If the Contractor should fail to meet the compaction or design requirements embodied in this document and on the applicable plans, he shall make the necessary readjustments until all work is deemed satisfactory, as determined by the Geotechnical Engineer or Architect/Engineer.
- E. After each rain event Geotechnical Engineer shall test fill material for optimum moisture. Do not place any fill material until desired moisture is achieved.

3.5 CLEARING AND GRUBBING

- A. Prior to grading, remove all debris off-site. Remove trees and brush including the root systems. Holes resulting from tree and brush removal should be prepared and backfilled in accordance with paragraphs 3.7, 3.8, 3.9, and 3.10. This may require deepening and/or widening the holes to adequately remove disturbed soil and provide room for compaction equipment. Strip the surface of all organics. Strippings meeting the requirements of Section 32 9000 may be used in landscape areas only.

3.6 CUTTING

- A. Building pads that are located within a cut/fill transition area will have to be overexcavated to provide a semi-uniform fill beneath the building pad. The portions of building pads located in cut areas shall be overexcavated to provide no more than 1 foot difference in fill placed in the same building pad.
- B. Do all cutting necessary to bring finish grade to elevations shown on Drawings.
- C. When excavation through roots is necessary, cut roots by hand.
- D. Carefully excavate around existing utilities to avoid unnecessary damage. The contractor shall anticipate and perform hand work near existing utilities as shown on the survey, without additional claims or cost.

3.7 STRUCTURAL EXCAVATION

- A. General: Excavate to bear on firm material at contract depth shown on Structural Drawings.
- B. Footings: All footing excavations shall be of sufficient width for installation of formwork, unless earth will retain its position during concreting. All portions of footings above grade must be formed. In the event that footings are placed against earth, footing widths below grade shall be increased 2 inches from those shown on Drawings and positive protection shall be provided for top corners of trench.
- C. Unsuitable Ground: Any errors in structural excavation, soft ground, or clay soils found when excavating shall be reported to Architect. In no case shall work be built on any such soft or clayey unsuitable surface without direction from the Architect. Restore excavations to proper elevation with engineered fill material compacted to 95% of dry density.

**EARTHWORK
SECTION 31 0000
3595001**

3.8 SUBGRADE PREPARATION

- A. Grade compact and finish all subgrades within a tolerance of 0.10' of grades as indicated on Drawings and so as not to pool water. Subgrade within building pads and concrete walks shall be within 0.05' of grades indicated.
- B. After clearing, grubbing and cutting, subsurface shall be plowed or scarified to a depth of at least 12", until surface is free from ruts, hummocks or other uneven features. Moisture condition to 2% above optimum moisture content and recompact to at least 95% of the maximum dry density as determined by ASTM Test Method D1557. If the existing soils are at a water content higher than specified, the contractor shall provide multiple daily aerations by ripping, blading, and/or discing to dry the soils to a moisture content where the specified degree of compaction can be achieved. After seven consecutive working days of daily aerations, and the moisture content of the soil remains higher than specified, the contractor shall notify the architect. If the existing soils have a moisture content lower than specified, the contractor shall scarify, rip, water and blade existing soil to achieve specified moisture content. The contractor shall make proper allowance in schedule and methods to complete this work.
- C. After subgrade for fill within building pad area or within paved areas has been cleared, plowed and scarified, it shall be disked or bladed until uniform and free from large clods, brought to 2% above optimum moisture content and compacted to not less than 95% of maximum dry density, as determined by ASTM Test Method D1557, and such expressed percentage thereof will be minimum acceptable density for specified work.
- D. Subgrade in areas to receive landscaping shall be compacted to (85%).
- E. Where Contractor over-excavates building pads through error, resulting excavation shall be recompacted as engineered fill at Contractor's expense.

3.9 PLACING, SPREADING AND COMPACTING FILL MATERIAL IN BUILDING PAD AND PAVEMENT AREAS

- A. Selected fill material shall be placed in layers which, when compacted, shall not exceed 6 inches in compacted thickness. Each layer shall be spread evenly and thoroughly mixed to insure uniformity in moisture content.
- B. Selected fill material shall be moisture-conditioned to specified moisture content. Selected fill material shall be unfrozen. When moisture content of fill material is below that specified, add water until proper moisture content is achieved. When moisture content is above that specified, aerate by blading or other methods mentioned in 3.08 B until moisture content is satisfactory.
- C. After each layer has been placed, mixed and spread evenly, it shall be thoroughly compacted to a minimum of 90% as determined by the ASTM D1557 Compaction Test. Compact each layer over its entire area until desired density has been obtained.
- D. Recomposition of Fill in Trenches and Compaction of Fill Adjacent to Walls: Where trenches must be excavated, backfill with material excavated. Place in lifts that when compacted do not exceed 6", moisture conditioned to (optimum)(2% above optimum)

moisture content, and compact to a minimum of 90% relative compaction in building pad and paved areas, and to 90% relative compaction in landscape areas.

- E. Jetting of fill materials will not be allowed.

3.10 FINAL SUBGRADE COMPACTION

- A. Building Pads: Upper 12" of all final building pad subgrades (including future buildings) shall be uniformly compacted at specified moisture content to at least 90% of maximum dry density, as determined by ASTM D1557 Compaction Test, regardless of whether final subgrade elevation is attained by filling, excavation, or is left at existing grade. After acceptance of final compaction test, contractor shall maintain the required moisture content of subgrade until concrete flatwork is placed.
- B. Paved Areas: Upper 12" of all final subgrades supporting pavement sections and all other flatwork shall be brought to specified moisture content and shall be uniformly compacted to not less than 95% of maximum dry density, regardless of whether final subgrade elevation is attained by filling, excavation, or is left at existing grade. After acceptance of final compaction test, contractor shall maintain the required moisture content of subgrade until concrete flatwork is placed.
- C. Other Fill and Backfill: Upper 12" of all other final subgrades or finish grades shall be compacted to 90% of maximum dry density.
- D. Gravel Fill: Do not place compacted gravel fill until after underground work and foundations are in place. Compact gravel fill with vibratory plate or similar equipment to preclude settlement.

3.11 PLACING, SPREADING, AND COMPACTION OF LANDSCAPE BACKFILL MATERIALS

- A. All landscaped areas shall receive topsoil. After subgrade under landscape area has been scarified and brought to 85% maximum dry density, top soil shall be placed evenly to depth of 12" at 85% of maximum dry density.
- B. Project Inspector must verify that materials are uniformly spread to minimum depth specified.

3.12 SLOPE CONSTRUCTION

- A. Cut slopes shall be constructed to no steeper than 2:1(horizontal:vertical). Fill slopes shall be constructed to no steeper than 2:1 (horizontal:vertical). Prior to placement of fill on an existing slope the existing slope shall be benched. The benches shall be in a ratio of 2 horizontal to 1 vertical. The face of the fill slopes shall be compacted as the fill is placed, or the slope may be overbuilt and then cut back to the design grade. Compaction by track walking will not be allowed.

3.13 FINISH GRADING

- A. At completion of project, site shall be finished graded, as indicated on Drawings. Finish grades shall be "flat graded" to grades shown on the drawing. Mounding of finish grades

**EARTHWORK
SECTION 31 0000
3595001**

will not be allowed unless otherwise directed on the landscape drawings. Tolerances for finish grades in drainage swales shall be $\pm 0.05'$. Tie in new and existing finish grades. Leave all landscaped areas in finish condition for lawn seeding. Landscaped planters shall be graded uniformly from edge of planter to inlets. If sod is used for turf areas the finish grade on which it is placed shall be lowered to allow for sod thickness.

- B. All landscape areas shall be left free of rock or foreign material.
- C. All landscape areas shall be approved by Architect prior to any planting.

3.14 SURPLUS MATERIAL

- A. Excavated material not required for grading or backfill shall be removed from site at contractor's expense.

3.15 CLEANING

- A. Refer to Section 01 7700.
- B. Remove from fill all vegetation, wood, form lumber, casual lumber, and shavings, in contact with ground; buried wood will not be permitted in any fill.

END OF SECTION

*s:\master specifications\division 31 - earthwork\31 0000_earthwork.docx
Received from WCEI: June 7, 2018, Updated format: 9-3-21*

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Trench backfill materials.

1.2 RELATED REQUIREMENTS

- A. Section 01 5000, Temporary Facilities and Controls.
- B. Section 01 8113, Sustainable Design Requirements, for CAL-Green **[and Collaborative for High Performance Schools (CHPS)]** general requirements and procedures.
- C. Section 31 0000, Earthwork.
- D. Section 32 8000, Irrigation.
- E. Section 33 0000, Utilities
- F. Section 33 4000, Storm Drainage Utilities.

1.3 REREENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CAL Green), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- C. California Plumbing Code (CPC), edition as noted on the drawings.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Submittal Procedures:
 - 1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
 - 2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
 - 3. Sustainable Design Submittals shall comply with the additional requirements of Section 01 8113, Sustainable Design Requirements.
- B. Coordination:
 - 1. General Contractor shall coordinate work as herein specified, in accordance with drawings and as required to complete scope of work with all related trades.

TRENCHING AND BACKFILLING
SECTION 31 2333
3595001

1.5 ACTION SUBMITTALS

- A. Provide supplier's descriptive literature for all products to demonstrate compliance with specified attributes:

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For contractor / Installer.

1.7 CLOSEOUT SUBMITTALS

- A. Guarantee: Submit subcontractor's guarantee.

1.8 QUALITY ASSURANCE

- A. Contractor / Installer shall have been in business for five (5) years providing/finishing similar size projects and complexity.
- B. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.
- C. All materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.

1.9 DELIVERY, STORAGE AND HANDLING

- A. Transport, store and handle in strict accord with the local jurisdiction.

1.10 FIELD CONDITIONS

- A. Contractor shall acquaint himself with all existing site conditions. If unknown active utilities are encountered during work, notify Architect promptly for instructions. Failure to notify will make Contractor liable for damage to these utilities arising from Contractor's operations subsequent to discovery of such unknown active utilities.
- B. Trench dewatering may be necessary. Contractor shall provide any and all tools, equipment and labor necessary for trench dewatering no matter what the source. Dewatering shall be continuous until all site utilities are installed and backfilled.

1.11 PROTECTION

- A. Adequate protection measures shall be provided to protect workers and passers-by on and off the site. Adjacent property shall be fully protected throughout the operations. Blasting will not be permitted. Prevent damage to adjoining improvements and properties both above and below grade. Restore such improvements to original condition should damage occur. Replace trees and shrubs outside building area disturbed by operations. Repair all trenches in grass areas with new sod (seeding not permitted) and "stake-off" for protection.

TRENCHING AND BACKFILLING
SECTION 31 2333
3595001

- B. Contractor shall be solely and completely responsible for working conditions at the job site, including safety of all persons and property during performance of the work. This requirement shall apply continuously and shall not be limited to normal working hours.
- C. Any construction review of the Contractor's performance conducted by the Architect or Owner is not intended to include review of the adequacy of the Contractor's safety measures, in, on or near the construction site.
- D. Provide shoring, sheeting, sheet piles and or bracing to prevent caving, erosion or gulying of sides of excavation.
- E. Surface Drainage: Provide for surface drainage during period of construction in manner to avoid creating nuisance to adjacent areas. Keep all excavations free from water during entire progress of work, regardless of cause, source or nature of water.
- F. Adjacent streets and sidewalks shall be kept free of mud, dirt or similar nuisances resulting from earthwork operations.
- G. The site and adjacent influenced areas shall be watered as required to suppress dust nuisance.
- H. Trees: Carefully protect existing trees which are to remain.

1.12 TRENCH SAFETY PROVISIONS

- A. General Contractor shall be solely responsible for safety design, construction and coordination with agencies having jurisdiction. If such plan varies from shoring system standards established by Construction Safety Orders, plan shall be prepared by registered civil or structural engineer.
- B. Nothing herein shall be deemed to allow use of shoring, sloping or protective system less effective than that required by Construction Safety Orders of California State Division of Industrial Safety.
- C. When trenching through paved surface, provide steel trench plates to cover open trenches daily until trenches are backfilled.

1.13 SEASONAL LIMITS

- A. No backfill material shall be placed, spread or rolled during unfavorable weather conditions. When work is interrupted by heavy rains, full operations shall not be resumed until field tests indicate that moisture content and density of fill are satisfactory.
- B. Material above optimum moisture shall be processed per Section 31 0000, Part 3, Article "Subgrade Preparation".

1.14 TESTING

- A. General: Refer to Section 31 0000, Part 1, Article "Testing" and Part 3, Article "Testing and Observation".

TRENCHING AND BACKFILLING
SECTION 31 2333
3595001

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Backfill materials: Pipeline and conduit trench backfill as shown on the plans and as specified below.
 - 1. $\frac{3}{4}$ inch crush rock.
 - 2. Native Materials: Soil native to Project Site, free of wood, organics, and other deleterious substances. Rocks shall not be greater than 3-inches.
 - 3. Sand: Fine granular material, free of organic matter, mica, loam or clay.
 - 4. Lean Mix Concrete: 3 sacks of cement per yard plus sand.
 - 5. Class 2 aggregate base, $\frac{3}{4}$ " rock, per Caltrans Section 26-1.02B
 - 6. Controlled Density Fill: 3 sack slurry backfill.
- B. Water: Furnish all required water for construction purposes, including compaction and dust control. Water shall be potable.
- C. Provide other bedding and backfill materials as described and specified in Section 33 0000, Section 33 4000 and Divisions 22 and 26.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verification of Conditions:
 - 1. Examine areas and conditions under which work is to be performed.
 - 2. Identify conditions detrimental to proper or timely completion of work and coordinate with General Contractor to rectify.

3.2 INSTALLATION

- A. Perform work in accordance with pipe manufacturer's recommendations, as herein specified and in accordance with drawings.

3.3 TRENCHING

- A. Make all trenches open vertical construction with sufficient width to provide free working space at both sides of trench around installed item as required for caulking, joining, backfilling and compacting; not less than 12 inches wider than pipe or conduit diameter, unless otherwise noted.
- B. Carefully excavate around existing utilities to avoid unnecessary damage. The contractor shall anticipate and perform hand work near existing utilities as shown on the survey, without additional claims or cost.
- C. Trench straight and true to line and grade with bottom smooth and free of edges or rock points.

TRENCHING AND BACKFILLING
SECTION 31 2333
3595001

- D. Where depths are not shown on the plans, trench to sufficient depth to give minimum fill above top of installed item measured from finish grade above the utility as follows:
1. Sewer pipe: depth to vary
 2. Storm drain pipe: depth to vary
 3. Water pipe - Fire Supply: 36 inches
 4. Water pipe – Domestic Supply: 30 inches

3.4 BACKFILL

- A. Pipe Trench Backfill is divided into three zones:
1. Bedding: Layer of material directly under the pipe upon which the pipe is laid.
 2. Pipe Zone: Backfill from the top of the bedding to 6 inches (compacted) over the top of the pipe.
 3. Upper Zone: Backfill between top of Pipe Zone and to surface of subgrade.
- B. Bedding: Type of material and degree of compaction for bedding backfill shall be as defined in the Details and Specifications.
- C. Pipe Zone and Upper Zone Backfill:
1. Type of material and degree of compaction Pipe Zone and Upper Zone Backfill shall be as required by Drawings, Details, & Specifications.
 2. Upper Zone Backfill shall not be placed until conformance of Bedding and Pipe Zone Backfill with specified compaction test requirements has been confirmed.
 3. Backfill shall be brought up at substantially the same rate on both sides of the pipe and care shall be taken so that the pipe is not floated or displaced. Material shall not be dropped directly on pipe.
- D. Backfill Compaction:
1. Backfill shall be placed in layers which, when compacted shall not exceed 6 inches in thickness. Each layer shall be spread evenly and thoroughly mixed to insure uniformity. Do not backfill over, wet, frozen or soft subgrade surfaces. Employ a placement method that does not disturb or damage foundation walls, perimeter drainage, foundation damp-proofing, waterproofing or protective cover.
 2. When moisture content of fill material is below that required to achieve specified density, add water until proper moisture content is achieved. When moisture content is above that required, aerate by blading or other methods until specified moisture content is met; see Section 31 0000, Part 3, Article "Subgrade Preparation".
 3. After each layer has been placed, mixed and spread evenly, it shall be thoroughly compacted to 95% of maximum dry density while at specified moisture content. Compact each layer over its entire area until desired density has been obtained.
 4. Compaction: All backfill operations shall be observed by the Inspector of Record and/or Geotechnical Engineer. Field density tests shall be made to check compaction of fill material. If densities are not satisfactory, Contractor will be

TRENCHING AND BACKFILLING
SECTION 31 2333
3595001

required to change equipment or procedure or both, as required to obtain specified densities. Notify Inspector and Architect at least 24 hours in advance of any operation.

E. Backfill in Areas Previously Lime or Cement Treated

1. Where trenching occurs in areas that have been lime or cement treated, class 2 aggregate bases or approved controlled density backfill material shall be used for the top 12-inches minimum of the trench or thickness shall match the depth of treated material.

3.5 TRENCH AND SITE RESTORATION

- A. Finished surface of trenches shall be restored to a condition equal to, or better than the condition as existed prior to excavation work.

3.6 PROTECTION

- A. Protect existing surfaces, structures, and utilities from damage. Protect work by others from damage. In the event of damage, immediately repair or replace to satisfaction of Owner.
- B. Repair existing landscaped areas to as new condition. Replant trees, shrubs or groundcover with existing materials if not damaged or with new materials if required. Replace damaged lawn areas with sod, no seeding will be permitted.
- C. Replace damaged pavement with new compatible matching materials. Concrete walks to be removed to nearest expansion joint and entire panel replaced. Asphalt to be cut neatly and replaced with new materials.
- D. Any existing materials removed or damaged due to trenching to be returned to new condition.

3.7 SURPLUS MATERIAL

- A. Remove excess excavated material, unused materials, damaged or unsuitable materials from site.

3.8 CLEANING

- A. Refer to Section 01 7700.
- B. Contractor will keep the work areas in a clean and safe condition so his rubbish, waste, and debris do not interfere with the work of others throughout the project and at the completion of work.
- C. After completion of work in this section, remove all equipment, materials, and debris. Leave entire area in a neat, clean, acceptable condition.

TRENCHING AND BACKFILLING
SECTION 31 2333
3595001

END OF SECTION

s:\master specifications\division 31 - earthwork\31 2333_trenching and backfilling.docx
Received from WCEI: October 20, 2012; Updated 9-2-21

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Aggregate.
 - 2. Asphalt paving.
 - 3. Seal coat.
 - 4. Wood headers and stakes.
 - 5. Pavement marking.
 - 6. Precast concrete bumpers.

1.2 RELATED REQUIREMENTS

- A. Section 01 5000, Temporary Facilities and Controls.
- B. Section 01 6116, Volatile Organic Compound (VOC) Restrictions, for VOC limits pertaining to adhesives, sealants, fillers, primers, and coatings.
- C. Section 01 8113, Sustainable Design Requirements, for CAL-Green **[and Collaborative for High Performance Schools (CHPS)]** general requirements and procedures.
- D. Section 31 0000, Earthwork.
- E. Section 31 2333, Trenching and Backfilling.
- F. Section 32 8000, Irrigation.
- G. Section 33 0000, Utilities.
- H. Section 33 4000, Storm Drainage Utilities.

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CAL Green), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- C. Local Jurisdiction: Any work within the street, highway or right-of-way shall be performed in accordance with the requirement of the governmental agencies having jurisdiction, and shall not begin until all of those governing authorities have been notified.
- D. ASTM International (ASTM):

ASPHALT CONCRETE PAVING
SECTION 32 1200
3595001

1. D698-00 Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures, Using 5.5 lb (2.49 Kg) Rammer and 12 inch (304.8 mm) Drop.
2. D1556-00 Test Method for Density of Soil in Place by the Sand-Cone Method.
3. D1557-02 Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 10 lb. (4.54 Kg) Rammer and 18 inch (457 mm) Drop.
4. D6628-16 Standard Specification for Color of Pavement Marking Materials.
5. D3017-05 Test Methods for Moisture Content of Soils and Soil-Aggregate Mixture by Nuclear Methods (Shallow Depth).
6. D4318-05 Test Method for Liquid Limit, Plastic Limit, and Plasticity Limit.

E. CALTRANS Standard Specifications.

F. CAL-OSHA, Title 8, Section 1590 (e).

1.4 ADMINISTRATION REQUIREMENTS

A. Submittal Procedures:

1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
3. Sustainable Design Submittals shall comply with the additional requirements of Section 01 8113, Sustainable Design Requirements.

1.5 ACTION SUBMITTAS

A. Provide supplier's descriptive literature for all products to demonstrate compliance with specified attributes.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Contractor / Installer.

B. Sustainable Design:

1. General
 - a. Submit information necessary to establish and document compliance with the California Green Building Standards Code.
 - b. Sustainable design submittals are in addition to other submittals.
2. The following information shall be provided:
 - a. Adhesives and Sealants: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.
 - b. Paints and Coatings: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.

1.7 CLOSEOUT SUBMITTALS

- A. Guarantee: Submit subcontractor's guarantee.

1.8 QUALITY ASSURANCE

- A. Contractor / Installer shall have been in business for five (5) years providing/finishing similar size projects and complexity.
- B. Contractor shall be solely responsible for all subgrades built. Any repairs resulting from inadequate compaction is the responsibility of the contractor.
- C. The representatives of the Owner's testing lab will not act as supervisor of construction, nor will they direct construction operations. Neither the presence of the Owner's testing lab representatives nor the testing by the Owner's testing lab shall excuse the contractors or subcontractors for defects discovered in their work during or following completion of the project. Correcting inadequate compaction is the sole responsibility of the contractor.
- D. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.
- E. All materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.
- F. Contractor shall provide verification that asphalt mix temperature meets the requirements of this specification at time of application.
- G. Tests (See Part 1, Article "Testing").

1.9 DELIVERY, STORAGE AND HANDLING

- A. Transport, store and handle in strict accord with the local jurisdiction.

1.10 FIELD CONDITIONS

- A. Environmental Requirements:
 - 1. Base Course: Do not lay base course on muddy subgrade, during wet weather, or when atmospheric temperature is below 40 degrees F.
 - 2. Asphalt Surfacing: Do not apply asphaltic surfacing on wet base, during wet weather, or when atmospheric temperature is below 50 degrees F.

1.11 EXISTING SITE CONDITIONS

- A. Contractor shall acquaint himself with all site conditions. If unknown active utilities are encountered during work, notify Architect promptly for instructions. Failure to notify will make Contractor liable for damage to these utilities arising from Contractor's operations subsequent to discovery of such unknown active utilities.

1.12 PROTECTION

- A. Adequate protection measures shall be provided to protect workmen and passers-by on and off the site. Adjacent property shall be fully protected throughout the operations. Blasting will not be permitted. Prevent damage to adjoining improvements and properties both above and below grade. Restore such improvements to original condition should damage occur. Replace trees and shrubs outside building area disturbed by operations.
- B. In accordance with generally accepted construction practices, the Contractor shall be solely and completely responsible for working conditions at the job site, including safety of all persons and property during performance of the work. This requirement shall apply continuously and shall not be limited to normal working hours.
- C. Any construction review of the Contractor's performance conducted by the owner's representative is not intended to include review of the adequacy of the Contractor's safety measures, in, on, or near the construction site.
- D. Surface Drainage: Provide for surface drainage during period of construction in manner to avoid creating nuisance to adjacent areas. The contractor shall make a reasonable effort on a daily basis to keep all excavations and the site free from water during entire progress of work, regardless of cause, source, or nature of water.
- E. Adjacent streets and sidewalks shall be kept free of mud, dirt or similar nuisances resulting from earthwork operations.
- F. The site and adjacent influenced areas shall be watered as required to suppress dust nuisance. Dust control measures shall be in accordance with the local jurisdiction.

1.13 SEASONAL LIMITS

- A. No fill material shall be placed, spread or rolled during unfavorable weather conditions. When work is interrupted by rains, fill operations shall not be resumed until field tests indicate that moisture content and density of fill are satisfactory.

1.14 TESTING

- A. General: Refer to Section 01 4523 – TESTING & INSPECTION SERVICES AND STRUCTURAL TESTS AND INSPECTIONS LIST, DSA-103.
- B. Geotechnical Engineer: Owner is retaining a Geotechnical Engineer to determine compliance of fill with Specifications, and to direct adjustments in fill operations. Costs of Geotechnical Engineer will be borne by Owner; except those costs incurred for re-tests or re-inspection will be paid by Owner and backcharged to Contractor.

PART 2 - PRODUCTS

2.1 DESIGN AND PERFORMANCE CRITERIA

- A. Sustainable Design:

**ASPHALT CONCRETE PAVING
SECTION 32 1200
3595001**

1. VOC emissions for field-applied adhesives, sealants, and sealant primers must comply with limits specified in Section 01 6116.
2. VOC emissions for field-applied paints and coatings must comply with limits specified in Section 01 6116.

2.2 MATERIALS

- A. Sterilant: Soil sterilizer shall be CIBA GEIGY's Pramitol 25-E, Treflan EC or Thompson-Hayward Casoron.
 1. Soil sterilizer shall be applied in strict accordance with manufacturer's instructions.
- B. Base Course Aggregate: State Specifications, Section 26, Class 2 aggregate base (3/4" max.).
- C. Asphalt Binder: Steam-refined paving asphalt conforming to State Specifications, Section 92, viscosity grade PG 64-10. Asphalt binder additives for HMA per Caltrans approved list of manufacturers.
- D. Liquid Asphalt Tack Coat: Per CALTRANS section 94.
- E. Surface Course Aggregate: Mineral aggregates for Type "B" asphalt concrete, conforming to State Specifications 39-2.02, Type B, 1/2" maximum, medium gradient. 3/8" maximum gradient at Playcourt.
- F. Seal Coat: shall be a pre-mixed asphalt emulsion blended with select fillers and fibers such as:
 1. "Park-Top No. 302", Western Colloid Products.
 2. "Overcoat", Reed and Gram.
 3. "Drivewalk", Conoco Oil.
- G. Wood Headers and Stakes: Pressure treated.
- H. Pavement Marking: Colors as directed by Architect. Colors of painted traffic stripes and pavement markings must comply with ASTM D6628.
 1. Waterborne traffic line - colors white, yellow and red, State specification PTWB-01R3.
 2. Waterborne traffic line for the international symbol of accessibility and other curb markings – blue, red and green, Federal specification TT-P-1952F.
- I. Precast Concrete Bumpers: 3000 psi at 28 day minimum strength; 48" length unless otherwise indicated; provide with steel dowel anchors and concrete epoxy.
- J. Pavement Epoxy; K-Lite; KtepX-590; Ennis Epoxy HPS2 or an approved equal.
- K. Crack Filler; QPR model CAR08, 10oz asphalt crack filler; Star STA-FLEX Trowel Grade crack filler or approved equal.

ASPHALT CONCRETE PAVING
SECTION 32 1200
3595001

- L. Reclaimed Asphalt Paugment (RAP). HMA Type A or Type B may be produced using RAP providing it does not exceed 15% or the aggregate blend.

2.3 MIXES

- A. General: Plant mixed conforming to State Specifications, Section 39, Type B, 1/2" maximum, medium grading. 3/8" maximum grading shall be used at hardcourt.
- B. Temperature of Hot Mix Asphalt: Not less than 275 degrees F nor more than 325 degrees F when added to aggregate.
- C. Temperature of Hot Mix Aggregate: Not less than 250 degrees F nor more than 325 degrees F when asphalt is added.
- D. Temperature of Hot Mix Asphalt Concrete: Asphalt shall be not less than 285 degrees at time of application, nor more than 350 degrees. Asphalt not meeting the required temperature shall not be used.
- E. Temperature of Warm Mix Asphalt: Mixing and placement; per the approved manufactures heat range recommendations for mixing and placement.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Conditions of Work in Place: Subsurfaces which are to receive materials specified under this Section shall be carefully examined before beginning work hereunder, and any defects therein shall be reported, in writing, to the Architect. Work shall not be started until such defects have been corrected. Starting of work shall imply acceptance of conditions as they exist.

3.2 PREPARATION

- A. Sub-Grade: Clean, shape and compact to hard surface free from elevations or depressions exceeding 0.05' in 10' from true plan. Compact per Section 31 0000. Compaction and moisture content shall be verified immediately prior to placement of aggregate base. Proof roll subbase in presence of geotechnical engineer prior to placement of aggregate base.

3.3 INSTALLATION

- A. Headers:
 - 1. General: Install as edging to asphalt paving, except where adjoining existing pavement, concrete curbs, walks or building.
 - 2. Existing Headers: Remove existing headers where new paving will join existing. Saw cut existing asphalt to provide clean edge.
 - 3. Lines and Levels: Install true to line and grade. Cut off tops of stakes 2-inches below top of header so they will not be visible on completion of job.

**ASPHALT CONCRETE PAVING
SECTION 32 1200
3595001**

B. Asphalt Paving:

1. Base Course: Install in accord with State Specifications, Section 26. Compact to relative compaction of not less than 95%, ASTM D1557. The material shall be deposited on the subgrade in such a manner as to provide a uniform section of material within five percent tolerance of the predetermined required depth. Deposition will be by spreader box or bottom dump truck to prevent segregation of the material. The material so deposited on the subgrade shall have sufficient moisture which, in the opinion of the Architect is adequate to prevent excessive segregation. It shall then be immediately spread to its planned grade and cross section. Undue segregation of material, excessive drifting or spotting of material will not be permitted. If in the opinion of the site geotechnical engineer, the material is unsuitably segregated, it shall be removed or completely reworked to provide the desired uniformity of the material.
 - a. Moisture content and compaction of base material shall be tested immediately prior to placement of asphalt paving.
2. Sterilant: Apply specified material at manufacturer's recommended rate. Applicator of sterilant material shall be responsible for determining location of all planter areas. Apply specified material over entire base course area just prior to application of asphalt. Follow manufacturer's printed directions.
3. Liquid Asphalt Tack Coat: Apply as "tack coat" to all vertical surfaces of existing paving, curbs, walks, and construction joints in surfacing against which paving is to be placed.
4. Asphalt Concrete Surface Course:
 - a. Comply with State Specifications, 39-6 except as modified below.
 - 1) Final gradation shall be smooth, uniform and free of ruts, humps, depressions or irregularities, with a minimum density of 91% of the theoretical maximum specific gravity determined by California Test Method #309. Maximum variation 1/8 inch in 10' when measured with steel straightedge in any one direction. Test paved areas for proper drainage by applying water to cover area. Correct portions that do not drain properly by patching with plant mix. In no case shall accessible parking spaces or loading and unloading areas exceed 2% slope in any direction.
 - 2) Asphalt material shall be delivered to the project site in a covered condition to maintain acceptable temperature.
5. Placement and adjustment of Frames, Covers, Boxes and Grates: The Contractor shall set and adjust to finish grade all proposed and existing frames, covers, boxes, and grates of all manholes, drop inlets, drain boxes, valves, cleanouts, electrical boxes and other appurtenant structures prior to placement of asphaltic concrete.
6. Water Testing: All paved areas shall be water tested, to check drainage, in the presence of the project inspector prior to placement of seal coat. The surface of asphalt paving shall not vary more than 1/8 inch above or below the grade established on the plans. If variations in grade are present, they will be corrected by overlaying paving and/or pavement removal and replacement as directed by the Architect.

**ASPHALT CONCRETE PAVING
SECTION 32 1200
3595001**

7. Patching: Cut existing paving square and plumb at all edges to be joined by new paving. In trenches; grind existing asphalt on each side of trench 3" wide x 1/2 the depth of the section. Apply tack coat to vertical surfaces before installing new work. Warp carefully to flush surface, with seal over joints, and feather edge. Sawcut, remove and patch existing paving where cutting is necessary for installation of piping or conduits under Divisions 15, 16 and 33.
8. Seal Coat:
 - a. Seal coat shall be applied no sooner than 30 days from time of asphalt placement.
 - b. Surface Preparation: surface shall be clean of all dirt, sand, oil or grease. Hose down entire area with a strong jet of water to remove all debris. Remove soft, loose, or otherwise damaged areas of asphalt concrete to full depth of damage and replace with compacted asphalt concrete as specified herein. Minor holes and imperfections may be patched using hot mix asphalt or mastic using sand/SS-1-H. Use wire brush for removal of oil and grease; prime with shellac or synthetic resin as recommended by manufacturer of pavement sealer material.
 - c. Seal Coat Seal Application: Thoroughly mix materials in the presence of the onsite inspector. Failure to do so will be cause for rejection. Apply in accordance with manufacturer's written instructions.
 - a. The minimum application rate for each applied coat shall be 30gals per 1000 sq. ft. Two coats of sealcoat will be required.
 - b. Clean-Up and Precautions: As recommended by pavement sealer material manufacturer.
 - d. Clean-Up and Precautions: As recommended by pavement sealer material manufacturer.
- C. Pavement Marking: painted pavement markings shall be done only after the seal coat has thoroughly dried. On clean surfaces to be painted with traffic paint of dust, dirt, grime, oil, rust or other contaminants which will impair the quality of work or interfere with proper bond of paint coats. Surfaces shall be cleaned to the extent and by whatever means that will satisfactorily accomplish the purpose without damage to asphalt concrete. Provide measured layouts, temporary markings, templates, and other means necessary to provide required marking. Prepare and apply paint in accordance with manufacturer's instructions; paint shall be applied by spray and shall achieve complete coverage free from voids and thin spots. Where indicated on the Drawings, paint parking stall strips, lettering, arrows, accessible symbols, playground markings, game striping, maps, etc. on concrete paving or asphalt concrete paving. Paint stripes shall be 4 inches wide (except otherwise indicated) and applied with two (2) coats of herein specified Traffic Line Paint; white (except as otherwise specified or indicated).
 1. International Accessible Symbol: Symbol shall be white figures on a blue background. Blue shall be equal to color No. 15090 in Fed. Std. 595c. Lines and symbols shall be accurately formed and true to line and form; lines shall be straight and uniform in width. Painted edges shall be clean cut and free from raggedness, and corners shall be cut sharp and square. Tolerances: Apply striping within a tolerance 1/2 inch in 50 feet. Apply markings and striping to widths indicated with a tolerance of 1/4 inch on straight sections and 1/2 inch on curved sections.

ASPHALT CONCRETE PAVING
SECTION 32 1200
3595001

- D. Colors: As directed by Architect
- E. Precast Concrete Bumpers: Install where shown, using steel dowels, and epoxy applied for length to wheel stop without damage to bumpers or asphalt concrete paving.

3.4 CLEANING

- A. Upon completion of work of this Section promptly remove from the working area all scraps, debris and surplus material of this Section.
- B. Clean excess material from surface of all concrete walks and utility structures.

END OF SECTION

*s:\master specifications\division 32 - site improvements\32 1200_asphalt concrete paving.docx
Received from WCEI: December 18, 2020, Format Updated 9-8-21*

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Concrete curbs and gutters.
2. Concrete pavement, sidewalks and ramps.
3. Steel reinforcing for flatwork and curbs.
4. Truncated domes.

1.2 RELATED REQUIREMENTS

- A. Section 01 6116, Volatile Organic Compound (VOC) Restrictions; for VOC limits pertaining to adhesives, sealants, fillers, primers, and coatings.
- B. Section 01 8113, Sustainable Design Requirements, for CAL-Green **[and Collaborative for High Performance Schools (CHPS)]** general requirements and procedures.
- C. Division 31, Earthwork.
- D. Section 32 1200, Asphalt Concrete Paving.

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CALGreen), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- C. American Concrete Institute (ACI):
1. 117: Specification for Tolerances for Concrete Construction and Materials and Commentary.
 2. 211.1: Standard Practice for Selecting Proportions for Normal, Heavyweight and Mass Concrete.
 3. 301: Specifications for Structural Concrete.
 4. 302.1R: Guide to Concrete Floor and Slab Construction.
 5. 305R: Guide to Hot Weather Concreting.
 6. 306R: Guide to Cold Weather Concreting.
 7. 308R: Guide to External Curing of Concrete.
 8. 318: Building Code Requirements for Structural Concrete and Commentary.
 9. 347R: Guide to Formwork for Concrete.
- D. ASTM International (ASTM):

1. A615/A615M: Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement.
 2. A706/A706M: Standard Specification for Deformed and Plain Low-Alloy Steel Bars for Concrete Reinforcement.
 3. C33/C33M: Standard Specification for Concrete Aggregates.
 4. C94/C94M: Standard Specification for Ready-Mixed Concrete.
 5. C143/C143M: Standard Test Method for Slump of Hydraulic-Cement Concrete.
 6. C150/C150M: Standard Specification for Portland Cement.
 7. C260/C260M: Standard Specification for Air-Entraining Admixtures for Concrete.
 8. C309: Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete.
 9. C330/C330M: Standard Specification for Lightweight Aggregates for Structural Concrete.
 10. C494/C494M: Standard Specification for Chemical Admixtures for Concrete.
 11. C618: Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete.
 12. C920: Standard Specification for Elastomeric Joint Sealants.
 13. C1107/C1107M: Standard Specification for Packaged Dry, Hydraulic Cement Grout (Non-Shrink).
 14. C1315: Standard Specification for Liquid Membrane-Forming Compounds Having Special Properties for Curing and Sealing Concrete.
 15. D1751: Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types).
 16. D5893/D5893M: Standard Specification for Cold Applied, Single Component, Chemically Curing Silicone Joint Sealant for Portland Cement Concrete Pavements.
- E. Concrete Reinforcing Steel Institute (CRSI):
1. Manual of Standard Practice.
 2. Placing Reinforcing Bars.
- F. State of California, Department of Transportation (Caltrans):
1. Division of Engineering Services:
 - a. California Test 342: Method of Test for Surface Skid Resistance with the California Portable Skid Test.
 2. Standard Specifications.
 - a. Section 51, Concrete Structures.
 - b. Section 52, Reinforcement.
 - c. Section 73, Concrete Curbs and Sidewalks.
 - d. Section 90, Concrete.
- G. US Government General Services Administration (GSA/SAE):

1. GSA/SAE AMS-STD-595A: Colors Used In Government Procurement.

1.4 ADMINISTRATIVE REQUIREMENTS

A. Submittal Procedures:

1. Action Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
3. Sustainable Design Submittals shall comply with the additional requirements of Section 01 8113, Sustainable Design Requirements.

1.5 ACTION SUBMITTALS

A. Shop Drawings: Joint pattern layout for walks and pavement.

B. Product Data:

1. A complete list of materials proposed to be used for the site concrete work including, but not limited to, sand, gravel, admixtures, surface treatments, coloring agents, sealers, cast-in-place accessories, forming and curing products, concrete mix designs, reinforcing materials, joint materials, curing materials, and detectable warning surface.
2. Manufacturer's descriptive literature for products proposed for use. Include installation instructions, and maintenance instructions.

C. Concrete Mix Design: The Contractor shall submit three copies of each proposed mix design for each class of concrete in accordance with ACI 301, Sections 3.9 "Proportioning on the Basis of Previous Field Experience or Trial Mixture," or 3.10 "Proportioning Based on Empirical Data." The Contractor shall submit a separate mix design for concrete to be placed by pumping, in addition to the mix design for concrete to be placed directly from the truck chute.

1. The following information shall be included in the concrete mix design:
 - a. Proportions of cement, fine and coarse aggregate, and water.
 - b. Water-cement ratio, 28-day compressive design strength, slump, and air content.
 - c. Type of cement and aggregate.
 - d. Special requirements for pumping.
 - e. Range of ambient temperature and humidity for which design is valid.
 - f. Special characteristics of mix, which require precautions in mixing, placing, or finishing techniques to achieve specified finished product.
2. Do not begin concrete production until mixes have been reviewed and approved by Engineer.
 - a. Review of mix design by the Architect and Engineer shall in no way relieve the subcontractor of his responsibility for the performance of the concrete.

D. Qualification Data: For manufacturer

- E. Delivery tickets as specified for ready-mixed concrete.
- F. Sustainable Design:
 - 1. General:
 - a. Submit information necessary to establish and document compliance with the California Green Building Standards Code.
 - b. Sustainable design submittals are in addition to other submittals.
 - 2. The following information shall be provided:
 - a. Adhesives and Sealants: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.
 - b. Paints and Coatings: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.

1.6 CLOSEOUT SUBMITTALS

- A. Guarantee: Submit subcontractor's guarantee.

1.7 QUALITY ASSURANCE

- A. Qualifications:
 - 1. Manufacturer of ready-mixed concrete products shall meet ASTM C94/C94M requirements for production facilities and equipment.
- B. Design, erect, support, brace and maintain formwork and shoring to safely support all loads that might be applied until such loads can be carried by concrete.
- C. The Contractor shall perform work in accordance with ACI 301.
- D. Use only new materials and products.
- E. Single-Source Responsibility: Use materials and products of one manufacturer whenever possible.
- F. Materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.
- G. Testing to determine compliance with the work of this Section will be the responsibility of the Contractor.
 - 1. Cement and reinforcing shall be tested in accordance with CBC Section 1910A. Testing of reinforcing may be waived in accordance with Section 1910A.2 when approved by the Engineer and DSA.
 - 2. Testing will be performed by an independent testing and inspecting agency in accordance with Section 01 4523, Testing and Inspection Services, and paid for by the Owner.
 - 3. Refer to Article FIELD QUALITY CONTROL in Part 3 of this Section for additional requirements.

4. Cost of retests and coring due to low strength or defective concrete will be paid by the Owner and back-charged to the Contractor.
- H. Sieve analysis from testing laboratories identifying rock/sand percentages within the concrete mix; or class 2 aggregate base shall have the current Project name and Project location identified on the report. Outdated analytical reports greater than 90 days old will not be accepted.
- I. Mockups: Provide on-site mockup panels for each type of exposed colored concrete flatwork showing texture and color before proceeding with finish to be used on this Project.
 1. Construct sample panels after review and approval of samples.
 2. Size: Minimum 5 feet square and have at least one longitudinal and one transverse joint unless a more specific note indicates otherwise on Drawings.
 3. Construct sample panels at location approved by Architect.
 4. Construct sample panels in ample time to allow for finishing and curing before requesting Architect to review.
 5. Follow procedures used on accepted samples.
 6. Include saw-cut and tooled joints to match method and appearance proposed for use in completed work.
 7. Prepare successive sample panels as required until finish, color, and appearance is approved by Architect.
 8. Do not remove sample panels until authorized in writing by the Architect and all concrete work has been approved.

1.8 DELIVERY, STORAGE AND HANDLING

- A. Deliver undamaged products to job in manufacturer's sealed containers and/or original bundles with tags and labels intact.
- B. Store materials in protected, dry conditions off of ground and in areas so as to not interfere with the progress of the Work.
- C. Transport, store and handle in strict accordance with the manufacturer's written recommendations.
- D. Store cement in weather tight building, permitting easy inspection and identification. Protect from dampness. Lumpy or stale cement will be rejected.
- E. Aggregates: Prevent excessive segregation, or contamination with other materials or other sizes of aggregate. Use only one supply source for each aggregate stock pile.

1.9 FIELD CONDITIONS

- A. Make and be responsible for all field dimensions necessary for proper fitting, slopes, and completion of work. Report discrepancies to Architect before proceeding.
- B. Do not place concrete during rain without adequate protection.

- C. The Contractor shall conform to ACI 306R when mixing and placing concrete during cold weather. Provide sufficient protection when daily temperatures drop below 40 degrees F.
- D. The Contractor shall conform to ACI 305R when mixing and placing concrete during hot weather. When air temperature exceeds 100 degrees F adjust concrete mix with retarding admixture in design mix, and adequately test and take additional measures as directed by concrete supplier.
- E. The Contractor shall maintain access for vehicular and pedestrian traffic as required for other construction activities. Use temporary striping, flagmen, barricades, warning signs, and warning lights as required.
- F. Placing in hot weather: Comply with ACI 305R. Concrete shall be delivered, placed and finished in a sufficiently short period of time to avoid surface dry checking.
 - 1. Concrete shall not exceed 85 degrees F at time of placement.
 - 2. Concrete shall be kept wet continuously after tempering until implementation of curing compound procedure in accordance with this specification.
 - 3. Evaporation Retarder: Apply evaporation retarder to concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 pounds per square foot per hour, before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.
- G. Placing in Cold Weather: Comply with ACI 306R. Protect from frost or freezing. No antifreeze admixtures are permitted.
 - 1. When placing concrete during freezing or near-freezing weather, mix shall have temperature of at least 50 degrees F but not more than 90 degrees F.
 - 2. Concrete shall be maintained at temperature of at least 50 degrees F for not less than 72 hours after placing or until it has thoroughly hardened.
 - 3. Provide necessary thermal coverings for any flat work exposed to freezing temperatures.

PART 2 - PRODUCTS

2.1 DESIGN AND PERFORMANCE CRITERIA

- A. Contractor shall comply with requirements applicable to this Section for concrete materials, admixtures, bonding materials, curing materials, surface sealers and others as required.
- B. Concrete walking surfaces shall have a coefficient of friction not less than 0.30 and will be subject to testing to verify compliance as specified in Article FIELD QUALITY CONTROL.
 - 1. The coefficient of friction will be measured by California Test 342 before pavement is opened to public traffic, but not sooner than 7 days after concrete placement.

2. Contractor shall notify the Architect and Project Inspector of pavement having a coefficient of friction less than 0.30.
- C. Sustainable Design:
1. VOC emissions for field-applied adhesives, sealants, and sealant primers must comply with limits specified in Section 01 6116.
 2. VOC emissions for field-applied paints and coatings must comply with limits specified in Section 01 6116.

2.2 FORMING MATERIALS

- A. Form Material: Steel, wood, or other suitable material of size and strength to resist movement during concrete placement and to retain horizontal and vertical alignment until removal. Use straight forms, free of distortion and defects. Use flexible spring steel forms or laminated boards to form radius bends as required. The forms shall be of a depth equal to the depth of curbing or sidewalk, and so designed as to permit secure fastening together at the tops. Coat forms with non-staining type coating that will not discolor or deface surface of concrete.
1. Concrete Exposed to View: 5/8-inch minimum APA B-B Plyform, steel or "Sonotube" forms by Sunoco, 888-875-8754, or equal.
 2. Concrete Concealed from View: 5/8-inch minimum APA B-B Plyform, steel or 1 x 8 DF, Number 2 Grade or better.
- B. Form Ties: Snap off metal of fixed length, leaving no metal within 1-1/2 inches of surface and no fractures, spalls or other surface defects larger than 1 inch diameter; manufactured by Burke, Dayton Superior, or equal.
- C. Spreaders: Metal. Wood is not permitted.
- D. Form Coating: Coat forms with non-staining material that will not discolor or deface surface of concrete or leave any residue on concrete that would interfere with surface coating as approved by the Architect.
- E. Chamfer Strips: Rigid polyvinyl chloride, 3/4-inch x 3/4-inch, in maximum possible lengths, manufactured by Burke, Greenstreak, Vulco, or equal.

2.3 REINFORCING MATERIALS

- A. Reinforcement Bars: New billet steel deformed bars conforming to requirements of ASTM A615/A615M or ASTM A706/A706M; Grade 60.
1. Bars for dowels installed through expansion joints or construction joints to existing sidewalks or concrete features shall be smooth or if deformed shall be sleeved on one end for slippage.
- B. Reinforcing Supports: Galvanized metal chairs or spacers or metal hangers, accurately placed 3 feet on center each way, staggered, with each support securely fastened to steel reinforcement in place.

1. Bottom bars in footings may be supported with 3-inch concrete blocks with embedded wire ties.
2. Concrete supports without wire ties will not be allowed.

2.4 CONCRETE MATERIALS

- A. Cement: Portland cement in accordance with ASTM C150/C150M, Type II, low alkali.
- B. Concrete Aggregates: Graded from coarse to fine in accordance with ASTM C33/C33M.
 1. Normal Weight Aggregates: Clean and free from deleterious coatings, clay balls, roots, and other extraneous materials, and in conformance with ASTM C33/C33M, except as otherwise specified. Combined grading shall meet limits of ASTM C33/C33M.
 - a. Size: Not be larger than one-fifth of the narrowest dimension between forms, or larger than three-fourths of the minimum clear spacing between reinforcing bars.
 2. Lightweight Aggregates:
 - a. General: Durable particles suitably processed, washed and screened without adherent coatings, free of materials with deleterious reactivity to alkali in cement, and conforming to ASTM C330/C330M.
 - b. Fine aggregate shall be natural sand, or sand prepared from stone or gravel, with grains free of silt, loam and clay.
- C. Water: Potable, clean, and in accordance with ASTM C94/C94M, free from injurious amounts of oil, acids, alkalis, salts, scale, organic materials or other deleterious matter, and in compliance with ACI 318 Section 26.4.1.3.
- D. Fly Ash: Western Fly Ash, conforming to ASTM C618 for Class N or Class F materials and in accordance with CBC Section 1903A.6.
 1. Class C is not permitted.
 2. Proportions: Not more than 15 percent (by weight) may be substituted for portland cement.

2.5 ADMIXTURES

- A. Water Reducing Admixture: Admixture to improve placing, reduce water cement ratio and ultimate shrinkage; "WRDA 64" by GCP Applied Technologies, or equal conforming to ASTM C494/C494M and ACI 318 Section 3.6.
 1. Water reducing admixture may be used subject to prior approval by the Architect, Engineer, and the Testing Lab.
 2. Proposed product and quantity shall be included in original design mix.
- B. Air-Entraining Admixture: "Daravair 1000" by GCP Applied Technologies or equal conforming to ASTM C260 and ACI 318, section 26.4.1.4.
 1. Proportion air entraining concrete to attain specified minimum 28-day compressive strength.

2. Total air entrainment in concrete shall be not less than 4 percent or more than 6 percent of the volume of concrete.
- C. Glare Reduction Colorant: Concentrated pigment dispersions designed to permanently color concrete; "Chromix L10 Base-Black" by Sika Corporation, or equal. *Was within 2.2 H.1*

2.6 CURING MATERIALS

- A. Clear Curing Compound: Water-based membrane-forming concrete curing compound in accordance with ASTM C309 and C1315; "Aqua Resin Cure Clear" by Burke CO, "1100" by W.R. Meadows, or equal.

2.7 ADDITIONAL MATERIALS AND COMPONENTS

- A. Concrete Bonding Agent: The following, or equal, conforming to ASTM C1059/C1059M.
 1. "Weld-Crete" by Larson Products Corporation, 800-633-6668.
 2. "Daraweld C" by GCP Applied Technologies, 877-423-6491.
- B. Patching Mortar: One-component, trowel applied, migrating-corrosion-inhibitor enhanced, polymer-modified, shrinkage-compensated, fiber reinforced, micro-silica enhanced, cementitious repair mortar for horizontal, vertical, and overhead applications; "Meadow-Crete GPS" by W.R. Meadows, or equal.
- C. Non-Shrink Grout: Premixed, non-metallic, no chlorides, non-staining and non-shrinking conforming to ASTM C1107/C1107M; "MasterFlow 713" by Master Builders Solutions, a division of BASF, 800-433-9517, or equal.
- D. Drainage Rock Base: 3/4-inch aggregate size conforming to Class 2 Aggregate Base as defined in Caltrans Standard Specifications Section 26, or equal clean free-draining gravel or crushed rock as recommended by the Geotechnical Engineer.
- E. Expansion Joint Material: Preformed 3/8-inch fiber material, with bituminous binder manufactured for use as concrete expansion joint material and conforming to ASTM D1751 and approved by Architect.
 1. Furnish joint fillers in one-piece lengths for full width being placed, wherever possible. Where more than one length is required, lace or clip joint-filler sections together.
- F. Joint Sealant for Expansion Joints in Concrete: Weather and UV resistant, single component, cold applied silicone sealant, Type S, conforming to ASTM D5893/D5893M; ASTM C920, Grade P, Class 25, Use T.
 1. Self-Leveling: "DOWSIL 890-SL Silicone Joint Sealant" by Dow Chemical Company, or equal.
 2. At Slopes Exceeding 5 Percent: Non-sagging; "DOWSIL 888 Silicone Joint Sealant" by Dow Chemical Company, or equal.
 3. Color: As standard with manufacturer.

- G. Pre-Formed Plastic Expansion Joint Caps: Polystyrene, with removable tops; "Snap Cap" by W. R. Meadows, Tex-Trude expansion caps, or equal.
- H. Truncated Domes: Vitriified Polymer Composite (VPC) cast-in-place detectable/tactile warning surface tiles complying with Americans with Disabilities Act (ADA) and the California Code of Regulations (CCR) Title 24, Part 2, Chapter 11B; "Armor-Tile", "Access Tile Tactile Systems," or equal.
 - 1. Color: Shall be yellow and approximate 33538 of GSA/SAE AMS-STD-595A in accordance with CBC Section 11B-705.1.1.3.1.
- I. Traffic Paint for Accessibility Striping at Stairs: VOC compliant, water-based, vinyl acrylic copolymer fast drying emulsion and specifically formulated as a traffic marking paint; "Setfast" with "Duckback" abrasive additive by Sherwin-Williams, "SAFE-STRIDE" by Wooster Products, Inc., or equal.
 - 1. Colors: As selected by Architect. [Yellow]
- J. Cast Abrasive Accessibility Strips and Stairs: Extruded aluminum with integral anchor and filled with abrasive granules in epoxy binder; Model ST-SF-N by Nystrom, Inc., 800-547-2635, Type T-24 by American Safety Tread Company, Inc., 800-245-4881, Type WP-24A by Wooster Products, Inc., 330-264-2844, or equal.
 - 1. Colors: As selected by Architect. [Yellow]

2.8 CONCRETE DESIGN AND CLASS

- A. Designed Strength and Classes of Concrete: The following mixes are not applicable to concrete items exceeding 4 feet in height above the adjacent grade.
 - 1. Class "B": Concrete shall have 1 inch maximum size aggregate, shall have 3000 pounds per square inch minimum at 28 day strength with a maximum water to cementitious ratio no greater than 0.50.
 - a. Location of Use: Exterior slabs, including walks, vehicular paved surfaces, manhole bases, poured-in-place drop inlets, curbs, valley gutters, curb and gutter, and other concrete of like nature.
 - 2. Class "D" concrete of 1 inch maximum size aggregate shall have 3500 pounds per square inch 28 day strength with a maximum water to cementitious materials ratio of 0.55.
 - a. Location of Use: Footings and retaining walls not attached to buildings, and planter walls, monument signs, and other site concrete not described for use in Class "B".
- B. Slump Limits: Provide concrete, at point of final discharge of proper consistency as tested in accordance with ASTM C143/C143M with slumps of 4 inches, plus or minus 1 inch.
- C. Mix Design: Concrete shall be designed for strength in accordance with provisions of CBC Section 1905A.

1. Should the Contractor desire to pump concrete, a modified mix design will need to be submitted for review.
 2. Fly ash may be used in concrete to improve workability in amounts up to 15 percent of the total cementitious weight.
- D. Air Entrainment: Provide at concrete paving / flatwork, including concrete ramps and stairs in accordance with local jurisdiction minimum requirements, but no less than 3 percent of the volume of concrete.
- E. Glare Reduction Additive:
1. General:
 - a. Provide at exterior concrete slabs, walks, ramps, stairs, including bleachers, and other exposed flatwork to eliminate glare.
 - b. Omit glare reduction colorant where color hardener, integral color, and stain treatment of concrete are scheduled.
 2. Quantity: As required to match approved sample but not exceed 2 pounds of colorant per cubic yard of concrete.
 3. Add colorant to mix in accordance with manufacturer's printed instructions.
- F. Coloring Agent:
1. Quantity: Add pigment as required to result in hardened concrete color consistent with approved sample but not exceeding maximum dosage per sack of cement as recommended by manufacturer based on total cementitious materials of mix design.
 2. Add pre-mixed colorant bags to mix in accordance with manufacturer's printed instructions.

2.9 MIXING OF CONCRETE

- A. Conform to requirements of CBC Chapter 19A.
- B. Concrete shall be mixed until there is uniform distribution of material and mass is uniform and homogenous; mixer must be discharged completely before the mixer is recharged.
- C. Concrete shall be Ready-Mixed Concrete: Mix and deliver in accordance with the requirements set forth in ASTM C94/C94M and ACI 301. Batch Plant inspection may be waived in accordance with CBC Section 1705A.3.3, when approved by the Project Engineer and DSA.
1. Furnish batch certificates for each batch discharged and used in the work.
 2. Approved Testing Laboratory shall check the first batching at the start of the work and furnish mix proportions to the Licensed Weighmaster.
 3. Licensed Weighmaster shall identify materials as to quantity and to certify to each load by ticket.
 4. Delivery tickets are to accompany each truck and shall be kept in the job superintendent's file. Delivery tickets must indicate the following information or be subject to rejection:

- a. Name of Project.
 - b. Supplier of concrete.
 - c. Truck identity and ticket serial number.
 - d. Date of delivery.
 - e. Brand of cement.
 - f. Cement content.
 - g. Strength classification.
 - h. Batching time.
 - i. Point of deposit.
 - j. Total amount of water.
 - k. Weight of aggregate.
 - l. Daily temperature.
 - m. Number of cubic yards in load.
 - n. Admixture content.
 - o. Name of Contractor.
 - p. Name of driver.
 - q. Time loaded and first mixing of concrete.
 - r. Reading of revolution counter.
 - s. Color additive.
5. Ticket shall be transmitted to Project Inspector by truck driver with load identified thereon. Project Inspector will not accept load without load ticket identifying mix and will keep daily record of pours, identifying each truck, its load and time of receipt, and will transmit two copies of record to DSA.
 6. At end of project, Weighmaster shall furnish affidavit to DSA on form satisfactory to DSA, certifying that all concrete furnished is in conformance with proportions established by mix designs.
 7. Placement of concrete shall occur as rapidly as possible after batching and in a manner which will assure that the required quality of the concrete is maintained. In no case may concrete be placed more than 90 minutes from batch time.
 - a. When air temperature is between 85 and 90 degrees F, reduce maximum batching to discharge time from 90 minutes to 75 minutes.
 - b. When air temperature is above 90 degrees F, reduce maximum batching to discharge time to 60 minutes.
 8. Water may be added to the mix only if neither the maximum permissible water-cement ratio nor the maximum slump is exceeded.
 - a. The quantity of water used for each batch shall be accurately measured.
 - b. In no case shall more than 10 gallons of water be added to a full 9-yard load, or 1 gallon per yard on remaining concrete within the drum, providing load tag indicates at time of mixing at plant an allowance for additional water.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Confirm general layout, grade, and joint pattern layout with the Architect prior to placing concrete.
- B. Verify that gradients and elevations of the base are correct, and that the base is dry.
- C. Contractor shall report in writing to the Architect prevailing conditions that will adversely affect satisfactory execution of the work of this Section.
 - 1. Do not proceed with work until unsatisfactory conditions have been corrected.
- D. Forms and reinforcements are subject to approval by the Project Inspector as specified in Article FIELD QUALITY CONTROL.

3.2 PREPARATION

- A. Remove frost, water, and other foreign materials from form surfaces, reinforcement, and embedded items against which concrete will be placed.
- B. When the ambient temperature necessitates the use of cold or hot weather concreting, make provisions in advance of concrete placement.
- C. Before placing concrete, clean tools and equipment, and remove debris from areas to receive concrete.
- D. Clean reinforcing and other embedded items of coatings, oil, mud and soil that may impair bond with concrete.
- E. Slab-On-Grade: After subgrade has been approved by Geotechnical Engineer, install specified drainage rock base material to thickness shown. Rock base shall be implemented and compacted in accordance with the Geotechnical Report and recommendations of the Geotechnical Engineer.

3.3 INSTALLATION – FORMWORK

- A. Form material shall be straight, true, sound and able to withstand deformation due to loading and effects of moist curing. Materials which have warped or delaminated, or require more than minor patching of contact surfaces, shall not be reused.
- B. Build forms to shapes, lines, grades and dimensions indicated. Construct formwork to maintain tolerances required by ACI 301. Forms shall be substantial, tight to prevent leakage of concrete, and properly braced and tied together to maintain position and shape. Butt joints tightly and locate on solid backing. Chamfer corners where indicated. Form bevels, grooves and recesses to neat, straight lines. Construct forms for easy removal without hammering, wedging or prying against concrete.
- C. Space clamps, ties, hangers and other form accessories so that working capacities are not exceeded by loads imposed from concrete or concreting operations.

- D. Build openings into vertical forms at regular intervals if necessary to facilitate concrete placement, and at bottoms of forms to permit cleaning and inspection.
- E. Build in securely braced temporary bulkheads, keyed as required, at planned locations of construction joints.
- F. Before placement of reinforcing steel, coat faces of all forms to prevent absorption of moisture from concrete and to facilitate removal of forms. Apply specified material in conformance with manufacturer's written directions.
 - 1. Seal all cut edges.
 - 2. Before re-using form material, inspect, clean thoroughly, and recoat.
- G. Slope tie-wires downward to outside of wall.
- H. Brace, anchor and support all cast-in items to prevent displacement or distortion.
- I. During and immediately after concrete placing, tighten forms, posts and shores. Readjust to maintain grades, levels and camber.
- J. Concrete Paving, Curbs, Curb and Gutters, Ramps:
 - 1. Expansion Joints: Install at locations indicated, and so that maximum distance between joints is 20 feet for exterior concrete unless otherwise shown. Expansion joint material shall be full depth of concrete section. Recess for snap cap and sealant when required.
 - 2. Curbs, Valley Gutter, and Curb & Gutter: Install expansion joints at 60 feet on center, except when placing adjacent to concrete walks, the expansion joints shall align with the expansion joints shown for the concrete walks. Expansion joint material shall be full depth of concrete section. Recess for snap cap and sealant when required.
 - 3. Isolation Joints: 3/8-inch felt between walls and exterior slabs or walks so that paved areas are isolated from all vertical features, unless specifically noted otherwise on plans.
 - 4. Exterior Concrete Paving: Install expansion joints at 20 feet on center maximum, both directions, unless shown otherwise on plans.
 - 5. Ramps: Whether shown or not, all ramps shall have control joints and expansion joints.
 - a. Control joints on ramps shall be aligned and placed in between the vertical posts for the handrails. The curbs, if required shall have control joints that align with the handrail posts.
 - b. Expansion joints shall be placed at the upper, intermediate, and bottom landings.
- K. Inspection: Refer to Article FIELD QUALITY CONTROL.

3.4 INSTALLATION – REINFORCING

- A. General: Reinforcing shall be accurately placed at locations indicated on the drawings within required tolerances and providing required clearances. Reinforcement shall be

secured prior to placement of concrete such that tolerances and clearances are maintained. Coverage shall be in accordance with Section 1907A.7 of the CBC.

1. Reinforcement must be in place before concreting is begun.
 2. Keep a person on the job to maintain position of reinforcing as concrete is placed.
 3. All expansion and construction joints in concrete shall have dowels of size and spacing as shown on the Drawings, or as approved by Architect.
 4. Give notice whenever pipes, conduits, sleeves, and other construction interferes with placement; obtain method of procedure to resolve interferences.
- B. Additional reinforcing steel shall be placed around all utility boxes, valve boxes, manhole frames and covers that are located within the concrete placements.
1. The bars shall be placed so that there will be a minimum of 1-1/2-inch clearance and a maximum of 3-inch clearance. The reinforcing steel shall be placed mid-depth of concrete slab.
- C. At right angles or intersections of concrete walks, additional 2 feet x 2 feet #5, 90 degree bars shall be added at all inside corners for additional crack control. The bars shall be placed 2 inches from concrete forms and supports, at mid-depth of slab.
- D. Reinforcing steel shall be adequately supported by approved devices on centers close enough to prevent any sagging.
- E. Placing Tolerances:
1. In accordance with ACI 301 or CRSI/WCRSI Recommended Practice for Placing Reinforcing Bars, unless otherwise shown.
 2. Clear distance between parallel bars in a layer shall be no less than 1 inch, the maximum bar diameter shall not exceed 1-1/2 times the maximum size of coarse aggregate.
- F. Splices:
1. General: Unless otherwise shown on drawings, splice top reinforcing at midspan between supports, splice bottom reinforcing at supports, and stagger splices. Bar laps shall be wired together. Reinforcing steel laps shall be as follows:
 - a. Length of Lap Splices in Concrete:
 - 1) No. 4 bar: 24 inches minimum.
 - 2) No. 5 Bar: Not less than 62 bar diameters.
 - 3) No. 6 Bar: 56 inches minimum.
 - 4) No. 7 Bars and Larger: Not less than 93 bar diameters.
 - b. All splices shall be staggered at 5 feet minimum from adjacent splices.
- G. Inspection: Refer to Article FIELD QUALITY CONTROL.

3.5 PLACING OF CONCRETE – GENERAL

- A. Adjacent finish surfaces shall be protected at all times during the concrete pour and finishing. Verify that all formwork is tight and leak-proof before concrete is poured. Finish work defaced during the concrete pour and finishing shall be replaced at no extra cost to Owner.
- B. Remove wood chips, sawdust, dirt, loose concrete and other debris just before concrete is to be poured. Use compressed air for inaccessible areas. Remove all standing water from excavations.
- C. Transport concrete from mixer to place of final deposit as rapidly as practicable by methods which will prevent separation or loss of ingredients. Deposit as close as practicable in final position to avoid re-handling or flowing. Partially hardened concrete must not be deposited in work. Concrete shall not be wheeled directly on top of reinforcing steel.
- D. Keep excavations free of standing water, but moisture condition sub-grade before concrete placement.
- E. Placing: Once started, continue concrete pour continuously until section is complete between predetermined construction joints. Prevent splashing of concrete onto adjacent forms or reinforcement and remove such accumulation of hardened or partially hardened concrete from forms or reinforcement before work proceeds in that area. Free fall of concrete shall not to exceed 4'-0" in height. If necessary, provide lower openings in forms to inject concrete and to reduce fall height.
- F. Remove form spreaders as placing of concrete progresses.
- G. Place footings as monolithic and in one continuous pour.
- H. Compacting: Concrete shall be compacted by mechanical vibrators.
 - 1. Concrete shall be thoroughly worked around reinforcement and embedded fixtures and into corners of forms.
 - 2. Vibrating shall not be applied to concrete which has already begun to initially set or be continued so long as to cause segregation of materials.

3.6 REMOVAL OF FORMS

- A. Remove without damage to concrete surfaces.
 - 1. Sequence and timing of form removal shall insure complete safety of concrete structure.
 - 2. Forms shall remain in place for not less than the following periods of time. These periods represent cumulative number of days during which temperature of air in contact with concrete is 60 degrees F and above.
 - a. Vertical Forms of Foundations, Walls and All Other Forms Not Covered Below: 5 days.
 - b. Concrete Paving Edge Screeds or Forms: 7 days.

3. Concrete shall not be subjected to superimposed loads (structure or construction equipment) until it has attained its full design strength and not for a period of at least 21 days after placing. Concrete systems shall not be subjected to construction loads in excess of design loads.
- B. Patching: Install specified patching mortar per manufacturer's recommendations. Repairs to defective concrete which affect the strength of any structural concrete member or component are subject to approval by the architect and DSA.

3.7 CONCRETE PAVING

- A. Concrete paving shall be formed and finished to required line and grades true and flat with a maximum tolerance of 1/8-inch in 10 feet for flatness and to slopes indicated.
- B. Concrete vibrator shall be used to assist concrete placement. Contractor shall have spare concrete vibrator on site during concrete placement.
- C. Thoroughly water and soak the subgrade of exterior concrete paving, curbs, curb and gutters, with multiple daily waterings for at least three days or as required to achieve required moisture content prior to the concrete pour in order to place the subgrade soils in full expansion.
 1. Provide damming as required to keep standing water within the formed area and to allow for proper saturation and full expansion of the subgrade soils.
 2. Remove standing water before concrete placement.
- D. Construction Joints:
 1. Keep exposed concrete face of construction joints continuously moist from time of initial set until placing of concrete; thoroughly clean contact surface by chipping entire surface not earlier than 5 days after initial pour to expose clean hard aggregate solidly embedded, or by approved method that will assure equal bond, such as green cutting.
 2. If contact surface becomes contaminated with soil, sawdust or other foreign matter, clean entire surface and re-chip entire surface to assure proper adhesion.

3.8 FINISHING

- A. Concrete Paving: Finish surface as required by ACI 302.1R using manual and vibrating screeds to place concrete level and smooth.
 1. Under no circumstances shall water be added to the top surface of freshly placed concrete.
 2. Use "jitterbugs" or other special tools designed for the purpose of forcing the course aggregate below the surface leaving a thick layer of mortar 1 inch in thickness.
 3. After tamping the concrete, wood float surface to a true and even plane.
 4. After floating with a wood bull float, make 2 passes with a steel Fresno trowel to start sealing the concrete surface.

5. While concrete is still wet but sufficiently hardened to bear a persons' weight on knee boards, start troweling with a steel hand trowel or a machine trowel in larger areas. Use sufficient pressure to bring moisture to surface.
 6. After surface moisture has disappeared, finish concrete utilizing steel, hand or power trowel.
 7. Completed surface shall be free from trowel marks, depressions, ridges or other blemishes. Tolerance for flatness shall be 1/8-inch in 10 feet.
 8. Provide final finish as follows, unless otherwise indicated:
 - a. Medium Broom Finish: Typical finish to be used at all exterior walks, stairs and ramps. Brooming direction shall run perpendicular to slope to form non-slip surface.
- B. Curb Finish: Steel trowel.
- C. Joints and Edges:
1. Mark-off exposed joints, where indicated, with 1/4-inch radius x 1 inch deep jointer or edging tool. Joints shall be clean, cut straight and parallel or square with respect to concrete walk edge.
 2. Tool edges of control joints, walk edges, and wherever concrete walk adjoins other material or vertical surfaces. Expansion joints shall be constructed as detailed on plans.
 3. The expansion joints shall be full depth as shown in the Drawings. Failure to do so will result in non-compliance and shall be immediately machine cut by the Contractor at its expense.

3.9 CURING

- A. Formed Concrete:
1. Keep forms and top on concrete between forms continuously wet until removal of forms, 7 days minimum.
 2. Maintain exposed concrete in a continuous wet condition for 14 days following removal of forms.
- B. Concrete Paving, Curb, Curb and Gutter, Valley Gutter:
1. Cure utilizing curing compound. If applicable, the Contractor shall verify that the approved curing compound is compatible with the approved colorant system.
 2. Curing compound shall be applied in a wet puddling application. Spotty applications shall be reason for rejection and possibly concrete removal and replacement at the contractor's expense with no compensation from the Owner.
- C. No curing compound shall be applied to areas scheduled to receive resilient track surface including, curbs, ramps, runways, and similar items.

3.10 DEFECTIVE CONCRETE

- A. General:

1. Determination of defective concrete shall be made by the Architect or Engineer whose opinion shall be final in identifying areas to be replaced, repaired or patched.
2. As directed by Architect, cut out and replace defective concrete.
 - a. Defective concrete shall be removed from the site.
 - b. No patching is to be done until surfaces have been examined by Architect and permission to begin patching has been provided.
 - c. Permission to patch an area shall not be considered waiver of right by the Owner to require removal of defective work, if patching does not, in opinion of Architect, satisfactorily restore quality and appearance of surface.
 - d. Remove and replace concrete if repair to an acceptable condition is not feasible.

B. Defective Concrete Is:

1. Concrete that does not match the approved mix design for the given installation type.
2. Concrete not meeting specified 28-day strength.
3. Concrete which contains rock pockets, voids, spalls, transverse cracks, exposed reinforcing, or other such defects which adversely affect strength, durability or appearance.
4. Concrete which is incorrectly formed, out of alignment or not plumb or level, or outside of the maximum tolerance for flatness and slopes indicated.
5. Concrete containing embedded wood or debris.
6. Concrete having large or excessive patched voids which were not completed under Architect's direction.
7. Concrete not containing required embedded items.
8. Concrete with excessive shrinkage, transverse cracking, crazing, curling; or defective finish.
9. Concrete that is unsuitable for placement or has set in truck drum for longer than 90 minutes from the time it was batched.
10. Concrete where expansion joint filler that is not isolating the full depth of the concrete section, and not recessed as required for backer rod and sealant where required.
11. Concrete that is excessively wet or excessively dry and will not meet the minimum or maximum slump required per mix design.
12. Finished concrete with oil stains from equipment use, and or rust spots that cannot be removed.
13. Concrete with control joints (weakened planed joints) that do not meet the required minimum depth shown on the drawings.
14. Concrete not meeting slip-resistance requirements.

C. Flatwork: The Owner reserves the right to survey the flatwork, to determine if flatwork is outside of the maximum tolerance for flatness and slopes as indicated.

1. If the flatwork is found to be out of tolerance, then the Contractor is required to replace concrete at no additional expense to the Owner.
2. Determination of flatwork flatness, surveying and remedial work must be completed far enough in advance so that the project schedule is maintained, delays are avoided, and the new flatwork or flatwork repairs are properly cured.
3. The Contractor will be responsible for reimbursing the Owner for costs associated with re-surveying to verify compliance of work remediated by the Contractor.

3.11 SEALANT

- A. Apply sealant in compliance with manufacturer's instructions, using hand guns or pressure equipment with proper nozzle size, on clean, dry, properly prepared substrates.
- B. Force sealants into joint against sides of joint to make uniform. Avoid pulling of the sealant from the sides. Fill sealant space completely with sealant.
- C. Finished joints shall be straight, uniform, smooth, and neatly finished.
- D. Remove any excess sealant from adjacent surfaces of joints utilizing the manufacturer's recommended solvent and cleaning processes. Leave the work in a neat, clean condition.

3.12 FIELD QUALITY CONTROL

- A. Inspection of Forms and Reinforcing:
 1. Approval of forms and reinforcing steel must be received from Project Inspector prior to pouring concrete.
 2. Notice of readiness to place first pour shall be given to Project Inspector, DSA, Architect, and Engineer not less than 48 hours prior to placement of concrete to allow for inspection.
 3. Pouring of concrete shall not proceed prior to completing requested adjustments to forms and reinforcing and without approval of Project Inspector.
- B. Testing of Concrete:
 1. Frequency and Samples for Testing:
 - a. Four identical cylinder samples for strength tests of each class of concrete placed each day shall be taken not less than once a day, or not less than once for each 50 cubic yards of concrete, or not less than once for each 2,000 square feet of surface area for slabs or walls.
 - b. In addition, samples for strength tests for each class of concrete shall be taken for seven-day tests at the beginning of the concrete work or whenever the mix or aggregate is changed.
 2. Testing:
 - a. Slump: Each truck's concrete shall be tested for slump before concrete is placed.
 - b. Strength:

- 1) Tests for strength will be conducted by Testing Agency on one cylinder at 7 days and two cylinders at 28 days. The fourth remaining cylinder will be available for testing at 56 days if the 28-day cylinder test results do not meet the required design strength.
 - 2) On a given project, if the total volume of concrete is such that the frequency of specified testing would provide less than five strength tests for a given class of concrete, tests shall be made from at least five randomly selected batches or from each batch if fewer than five batches are used.
- C. Slip-Resistance Testing: Owner's Testing Agency will perform testing on flatwork to verify compliance with specified slip-resistance.
1. The coefficient of friction will be measured by California Test 342 before pavement is opened to public traffic, but not sooner than 7 days after concrete placement
 2. Where paving is determined to have a coefficient of friction less than 0.30, Contractor is to repair and/or replace these surfaces at no cost to Owner.

3.13 CLEANING

- A. Upon completion of work of this Section promptly remove from the working area all scraps, debris and surplus material of this Section.
- B. Clean excess material from surface of all concrete walks and utility structures.
- C. Power wash concrete surfaces to remove stains, dried mud, tire marks, and rust spots.
- D. Comply with any additional requirements of additive manufacturer for colored concrete.

3.14 PROTECTION

- A. Graffiti-resistant Coating:
 1. Surface Preparation: Prepare concrete surface to receive graffiti-resistant coating specified in Section 09 9623, Graffiti-Resistant Coatings, where indicated.
 2. Concrete must be clean, dry, and free of efflorescence and dust.
- B. Protect work and materials of this Section prior to and during installation, and protect the installed work and materials of other trades.
- C. In the event of damage during construction, make all repairs and replacements necessary to the approval of the Architect, at no additional cost to the Owner.

END OF SECTION

PART 1 – GENERAL

1.1 WORK INCLUDED

Provide all labor, materials, and tools necessary for the complete installation of a poured in place safety surfacing system composed of a wearing layer upper membrane and an underlying impact attenuation cushion layer as outlined in these specifications. The system should consist of but not necessarily be limited to the following:

- A. Section includes: Resilient playground surfacing poured in place system.
- B. Related work: Playground equipment and resilient playground surfacing sub base.
- C. Quality Assurance: Manufacturer should have manufactured and installed playground poured in place safety surfaces for a minimum of 5 years and meet current ASTM F-1292 Test Criteria. The installation of the poured in place product should be completed by FLEXGROUND. Manufacturer's detailed installation procedures should be submitted to the Architect and made part of the Bid Specifications.

1.2 SUBMITTALS

Prospective manufacturers and/or installers of the poured in place safety surfacing system should be required to comply with the following:

- A. The manufacturer must be experienced in the manufacturing of a poured in place safety surfacing system and provide references of five (5) specific installations in the last three (3) years.
- B. The installer must provide competent workmen skilled in this specific type of poured in place safety surfacing system installation. The designated supervisory personnel on the project must be competent in the installation of this material, including mixing of the materials, and spreading and compacting the materials correctly.
- C. Installation should be in accordance with ASTM F1292 for Impact Attenuation of surface system under and around playground equipment. The poured in place system to be installed in compliance with the Critical Fall Height as determined by the Playground Equipment.
- D. IPEMA Certification specific to poured in place safety surfacing.
- E. IPEMA certification specific to ½" layer of 1-4mm TPV over cushion layer .5mm TPV or EPDM IPEMA certification not acceptable.
- F. Manufacturer should provide written instructions for recommended maintenance practices.
- G. Manufacturer should submit color samples for customer verification. Color samples shall be 6" x 6" of ½" top wear course layer with aromatic or aliphatic binder – per client selection or specification; or 8 oz clear plastic jars with specified colored granules. Sample submittal format per client preference.

1.3 DEFINITIONS

PLAYGROUND PROTECTIVE SURFACES
SECTION 32 1816.13
3595001

- A. EPDM granules: EPDM rubber (ethylene propylene diene monomer (M-class) rubber), a type of synthetic rubber, is an elastomer characterized by a wide range of applications. The M refers to its classification in ASTM standard D-1418; the M class includes rubbers having a saturated chain of the polymethylene type.
- B. Critical Fall Height: A critical fall height (CFH) is the maximum height of fall from play equipment to the ground. It is important to note that safety surfaces do not prevent injury but aim to lessen the severity of any injury that may occur on falls from height.
- C. Fall Height: Fall height is a measurement defined as the vertical distance between a designated play surface and the protective surfacing beneath it.
- D. TPV: Thermoplastic Vulcanized Elastomer. Developed using resin and synthetic rubber with higher UV stabilization.
- E. SBR: Styrene-butadiene or styrene-butadiene rubber (SBR) describe families of synthetic rubbers derived from styrene and butadiene.

1.4 ASTM TESTING STANDARDS – FlexGround Standard meets or exceeds all required ASTM standards below.

- A. ASTM D624 Standard Test Method for Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomers.
- B. ASTM D2859 Standard Test Method for Flammability of Finished Textile Floor Covering Materials
- C. ASTM E303 Standard Test Method for Measuring Surface Frictional Properties Using the British Pendulum Tester
- D. ASTM F1292 Standard Specification for Impact Attenuation of Surface Systems Under and Around Playground Equipment
- E. ASTM F1951 Standard Specification for Determination of Accessibility of Surface Systems Under and Around Playground Equipment
- F. ASTM C1028 Standard Test Method for Determining the Static Coefficient of Friction of Ceramic Tile and Other Like Surfaces by the Horizontal Dynamometer Pull Meter Method – This standard replaces ASTM D2047
- G. ASTM D412 Standard Test Methods for Vulcanized Rubber and Thermoplastic Rubbers and Thermoplastic Elastomers- Tension

1.5 WARRANTY AND MAINTENANCE

The bidder and/or poured in place safety surfacing manufacturer must provide the following:

- A. The poured in place safety surfacing manufacturer should provide a warranty to the owner that covers defects in materials and workmanship of the rubber for a period of **FIVE (5) years** from the date of Substantial Completion.

PLAYGROUND PROTECTIVE SURFACES
SECTION 32 1816.13
3595001

- B. The manufacturer's warranty should include general wear and tear. The warranty should specifically exclude vandalism, high heel punctures, acts of war or acts of nature beyond the control of the owner or the manufacturer.
- C. All poured in place warranties should be limited to repair or replacement of the affected areas and should include all necessary materials, labor, transportation costs, etc. to complete said repairs. All warranties are contingent on the full payment by the owner of all pertinent invoices and adherence to any required maintenance procedures.
- D. The installer should clean the jobsite of excess materials and, if necessary, backfill any excavation around the perimeter with earth or other appropriate fill material.
- E. The manufacturer should instruct the owner's personnel on proper maintenance and repair of the ENDURAFLEX safety surface.

PART 2 – PRODUCTS

- A. The FLEXGROUND ENDURAFLEX, or equal, poured in place safety surfacing system should be in accordance with the following:
- B. A dual durometer poured in place system with a wearing layer upper membrane and an underlying impact attenuation cushion layer. The finished surface should be porous and capable of being installed at varying thickness to comply with the Critical Fall Height requirements of the playground equipment.
- C. FLEXGROUND primer is a 100% solids urethane primer/sealer. It is designed with low viscosity and penetrating abilities making this an ideal priming urethane.
- D. The cushion layer should be a mixture of black recycled SBR rubber buffings mixed with a 100% solids moisture cured MDI Polyurethane binder or aliphatic (100 pounds of SBR rubber buffings to 12 pounds of binder) installed at the appropriate thickness. As an upgrade, or if recycled SBR rubber buffings are not available, 5/8" chunk rubber with correct amount of urethane for impact attenuation and longevity may be used. **Chunk rubber shall not include SBR derived from rubber tires.** It must be high quality preconsumer recycled rubber containing EPDM. The cushion layer should be porous.
- E. The ENDURAFLEX wearing surface should be manufactured from 1-4mm Thermoplastic Vulcanized (TPV) virgin colored rubber granules bonded by FLEXGROUND binder, 100% solids moisture cured Polyurethane binder or aliphatic (110 pounds of TPV to 22 pounds of binder), and applied to a minimum thickness of 1/2" (12.7 mm) over the cushion layer.
- F. The system color should be selected from Manufacturer's Color Chart by owner prior to bid.
- G. High Wear Coating: Flexgrout as manufactured by Flexground, or corresponding equal.

PART 3 – EXECUTION

3.1 GENERAL

PLAYGROUND PROTECTIVE SURFACES
SECTION 32 1816.13
3595001

- A. Install all systems in full accordance with manufacturer's recommendations.
- B. Slope across finished product shall not be greater than 2% in any direction. Contractor shall carefully checked grades during installation of perimeter curb and play equipment access points to assure that all slopes are less than 2%.

3.2 SITE PREPARATION AND BASE

The ENDURAFLEX site preparation and base should be in accordance with the following:

- A. The sub-base will have a slope as per design.
- B. The base aggregate should consist of free-draining stone compacted to 95%, thickness per plan. Finish slope of porous aggregate should be 2% from the centerline of the area to the perimeter, and the grade should not vary more than a quarter inch (1/4") in ten feet (10').
- C. The sub-base should be compacted using vibrating tamper, to approximately 95% Proctor density.
- D. The sub-grade should no longer have any vegetation.
- E. Subgrade prior to aggregate installation: Sublevel grade is to be compacted prior to the ABC aggregate installation. Particular attention should be paid to areas of disturbed earth such as where footers for playground equipment enter the ground. Concrete should be poured to the top of sublevel surface.
- F. The poured in place safety surfacing manufacturer and architect will accept the aggregate base in writing prior to the installation of the poured in place system.
- G. Any alterations must be agreed between all parties.

3.3 INSTALLATION

- A. The poured in place safety surfacing installer should strictly adhere to the installation procedures outlined under these sections. Any variance from these requirements should be accepted in writing by the manufacturer's onsite representative and submitted to the architect/owner, verifying that the changes do not in any way affect the warranty.

3.4 PERIMETER

- A. A urethane primer should be applied to concrete, asphalt or wood surfaces at a rate of 200-250 square feet per gallon. The entire area does not need to be primed at once, instead, prime about 700 square feet at a time. This procedure should be continued until all areas are complete.
- B. The urethane primer should be applied to any playground equipment that will be surrounded by the poured in place safety surfacing system.

3.5 CUSHION LAYER

- A. Provide a single pour installation for each area. No seams allowed in material.

PLAYGROUND PROTECTIVE SURFACES
SECTION 32 1816.13
3595001

- B. The components of the poured in place safety surfacing should be mixed on site in a mixer to ensure a comprehensive mix according to manufacturer's instructions.
- C. The cushion layer comprised of SBR buffings shall be mixed with the MDI moisture cure polyurethane binder at a rate of 12% of the total weight of the material thoroughly so that the binder is evenly dispersed into the rubber base.
- D. The cushion layer comprised of non-tire derived SBR & EPDM Chunk Rubber shall be mixed with the appropriate amount of urethane so that the binder is evenly dispersed into the rubber base.
- E. The cushion layer mix should then be spread and troweled to the desired depth and allow to cure for 24 hours.

3.6 WEAR COURSE LAYER

- A. Provide a single pour installation for each area. No seams allowed in finished product.
- B. The wear course layer should be mixed with 1-4mm TPV granules and urethane binder at a rate of 20% of the total weight of the materials so the granules are covered thoroughly and evenly.
- C. The wear course layer mix should be spread and troweled to a depth of a half inch ($\frac{1}{2}$ ") immediately after the application of primer.
- D. Where seams are required due to color change, a step configuration with a 4" overlap will be constructed to maintain wear surface integrity.
- E. The finished texture should be slip resistant, smooth and even.
- F. The poured in place surface should be allowed to cure for 24-72 hours or until dry to the touch.

3.7 GROUT SEALER AT HIGH WATER AREAS

- A. Provide at base of main access point to structure, at bottom of slides, beneath swings, other high traffic, high wear areas.
- B. The wear course layer should be sealed with a thermoplastic composite grout. FLEXGROUT should be spread with a trowel at a rate of 1 gallon per 30 square feet. Pressure should be applied to the trowel with enough force to push the grout into the wear course layer, rendering it impermeable. The finished texture should be slip resistant and even.
- C. The poured in place surface should be allowed to cure for 24-72 hours or until dry to the touch.
- D. Color Seal - The color seal should consist of a water based composite liquid. Color seal should be rolled (or can be sprayed) to completely cover entire surface. The color seal should be allowed to cure for 24-72 hours or until dry to touch.

3.8 CLEAN UP

PLAYGROUND PROTECTIVE SURFACES
SECTION 32 1816.13
3595001

- A. Trailer/ Large truck access will be necessary for the installation. In the case that access for trailer/truck is not available the owner or general contractor will be responsible for transporting material to the job site.
- B. Crew is responsible for protecting the surface only while on site. General Contractor or owner shall be responsible for the security of the surfacing overnight during installation, as well as during the surfacing's curing period upon completion of the install.
- C. Crew will leave site clean and shall remove all trash and debris.
- D. Owner/General contractor shall provide a dumpster for all waste and trash.

END OF SECTION

PART 1 – GENERAL

1.1 SUMMARY

- A. Provide all labor, materials, equipment, and tools necessary for the complete installation of an attenuated synthetic grass infill system as outlined in these specifications. The system should consist of but not necessarily be limited to the following:
- B. A vertical draining field base consisting of a four-inch layer of compacted ¾" Class 2 aggregate compacted to 95% and four-inch layer of Class 2 permeable base compacted to 90-95% relative compaction.
- C. A complete synthetic grass system, consisting of:
 - 1. Synthetic turf
 - 2. Cushion layer
 - 3. An infill system, consisting of a specially formulated non-expansive, coated, clean, dust free and specially sized silicon dioxide bead (Envirofill brand preferred).
- D. Quality Assurance: Manufacturer should have manufactured and installed synthetic grass surfaces for a minimum of 5 years. Manufacturer's detailed installation procedures should be submitted to the Architect and made part of the Bid Specifications.

1.2 RELATED REQUIREMENTS

- A. Section 01 5000, Temporary Facilities and Controls.
- B. Section 31 0000, Earthwork.
- C. Section 33 4000, Storm Drainage Utilities.

1.3 REREENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. ASTM D624 Standard Test Method for Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomers.
- C. ASTM D2859 Standard Test Method for Flammability of Finished Textile Floor Covering Materials
- D. ASTM E303 Standard Test Method for Measuring Surface Frictional Properties Using the British Pendulum Tester
- E. ASTM F1292 Standard Specification for Impact Attenuation of Surface Systems Under

and Around Playground Equipment

- F. ASTM F1951 Standard Specification for Determination of Accessibility of Surface Systems Under and Around Playground Equipment
- G. ASTM C1028 Standard Test Method for Determining the Static Coefficient of Friction of Ceramic Tile and Other Like Surfaces by the Horizontal Dynamometer Pull Meter Method – This standard replaces ASTM D2047
- H. ASTM D412 Standard Test Methods for Vulcanized Rubber and Thermoplastic Rubbers and Thermoplastic Elastomers- Tension

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Submittal Procedures:
 - 1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
 - 2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
 - 3. Sustainable Design Submittals shall comply with the additional requirements of Section 01 8113, Sustainable Design Requirements.
- B. Coordination:
 - 1. General Contractor shall coordinate work as herein specified, in accordance with drawings and as required to complete scope of work with all related trades.

1.5 ACTION SUBMITTALS

- A. Provide supplier's descriptive literature for all products to demonstrate compliance with specified attributes:

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For contractor / Installer.
Prospective manufacturers and/or installers of the turf should be required to comply with the following:
 - I. The turf manufacturer must be experienced in the manufacture of a no nail synthetic grass system and provide references of five (5) specific installations in the last three (3) years.
 - J. The turf installer must provide competent workmen skilled in no nail synthetic grass installation. The designated supervisory personnel on the project must be competent in the installation of this material, including gluing seams and proper installation of the infill mixture.
- K. Installation should be in accordance with ASTM F1292 for Impact Attenuation of surface system under and around playground equipment. The poured in place system to be installed in compliance with the Critical Fall Height as determined by the Playground

Equipment (if any).

- L. Manufacturers should provide written instructions for recommended maintenance practices.

1.7 CLOSEOUT SUBMITTALS

- A. Guarantee: Submit subcontractor's guarantee.

1.8 QUALITY ASSURANCE

- A. Contractor / Installer shall have been in business for five (5) years providing/finishing similar size projects and complexity.
- B. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.
- C. All materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.

1.9 DELIVERY, STORAGE AND HANDLING

- A. Transport, store and handle in strict accord with the local jurisdiction.

1.10 FIELD CONDITIONS

- A. Contractor shall acquaint himself with all existing site conditions. If unknown active utilities are encountered during work, notify Architect promptly for instructions. Failure to notify will make Contractor liable for damage to these utilities arising from Contractor's operations subsequent to discovery of such unknown active utilities.
- B. Trench dewatering may be necessary. Contractor shall provide any and all tools, equipment and labor necessary for trench dewatering no matter what the source. Dewatering shall be continuous until all site utilities are installed and backfilled.

1.11 PROTECTION

- A. Adequate protection measures shall be provided to protect workers and passers-by on and off the site. Adjacent property shall be fully protected throughout the operations. Blasting will not be permitted. Prevent damage to adjoining improvements and properties both above and below grade. Restore such improvements to original condition should damage occur. Replace trees and shrubs outside building area disturbed by operations. Repair all trenches in grass areas with new sod (seeding not permitted) and "stake-off" for protection.
- B. Contractor shall be solely and completely responsible for working conditions at the job site, including safety of all persons and property during performance of the work. This requirement shall apply continuously and shall not be limited to normal working hours.
- C. Any construction review of the Contractor's performance conducted by the Architect or Owner is not intended to include review of the adequacy of the Contractor's safety measures, in, on or near the construction site.

SYNTHETIC TURF
SECTION 32 1816.16
3595001

- D. Provide shoring, sheeting, sheet piles and or bracing to prevent caving, erosion or gullyng of sides of excavation.
- E. Surface Drainage: Provide for surface drainage during period of construction in manner to avoid creating nuisance to adjacent areas. Keep all excavations free from water during entire progress of work, regardless of cause, source or nature of water.
- F. Adjacent streets and sidewalks shall be kept free of mud, dirt or similar nuisances resulting from earthwork operations.
- G. The site and adjacent influenced areas shall be watered as required to suppress dust nuisance.
- H. Trees: Carefully protect existing trees which are to remain.

1.12 TRENCH SAFETY PROVISIONS

- A. General Contractor shall be solely responsible for safety design, construction and coordination with agencies having jurisdiction. If such plan varies from shoring system standards established by Construction Safety Orders, plan shall be prepared by registered civil or structural engineer.
- B. Nothing herein shall be deemed to allow use of shoring, sloping or protective system less effective than that required by Construction Safety Orders of California State Division of Industrial Safety.
- C. When trenching through paved surface, provide steel trench plates to cover open trenches daily until trenches are backfilled.

1.13 SEASONAL LIMITS

- A. No backfill material shall be placed, spread or rolled during unfavorable weather conditions. When work is interrupted by heavy rains, full operations shall not be resumed until field tests indicate that moisture content and density of fill are satisfactory.
- B. Material above optimum moisture shall be processed per Section 31 0000, Part 3, Article "Subgrade Preparation".

1.14 TESTING

- A. General: Refer to Section 31 0000, Part 1, Article "Testing" and Part 3, Article "Testing and Observation".

1.15 WARRANTY AND MAINTENANCE

- A. The bidder and/or the turf manufacturer must provide the following:
- B. The turf manufacturer should provide a warranty to the owner that covers defects in materials and workmanship of the turf for a period of **FIVE (5) years** from the date of Substantial Completion, and **TWO (2) years** on seams.
- C. The manufacturer's warranty should specifically exclude vandalism, acts of War and acts of Nature beyond the control of the owner of the manufacturer.

- D. All turf warranties should be limited to repair or replacement of the affected areas and should include all necessary materials, labor, transportation costs, etc. to complete said repairs.
- E. All warranties are contingent upon full payment by the owner of all pertinent invoices and owner, at owner's expense, completing a full power-brooming and "top-off" of lost infill at two-year intervals from date of substantial completion.
- F. The bidder should provide a maintenance program to the owner. The warranty should be subject to compliance with said maintenance program in addition to items named above.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

The synthetic turf material and resilient cushion should be in accordance with the following:

- A. Acceptable Manufacturer: Beyond Grass Premium or Tencate Grass.
- B. Or approved equal.

2.2 SYSTEM REQUIREMENTS

- A. A poured in place system with a synthetic grass wearing layer upper membrane and an underlying impact attenuation cushion layer. The finished surface should be porous and capable of being installed at varying thickness to comply with Critical Fall Height requirements of playground equipment.
- B. The cushion layer should be a mixture of black recycled rubber mixed with a 100% solids moisture cured aromatic Polyurethane binder (100 pounds of rubberized cushion layer to 12 pounds of binder) installed at the appropriate thickness.
- C. Synthetic Turf shall be:
 - 1. A 1-1/2" monofilament polyethylene with brown thatch yarn, formulated for superior wear resistance and a secondary proprietary polyethylene thatch. Product must have built-in antimicrobial protection to inhibit the growth of bacteria, mold, mildew, and reduce odor.
 - 2. The system should be tufted with a minimum of 60 ounce of yarn per square yard. The system should also include a primary woven polypropylene backing and a polyurethane secondary backing. Finish coating shall be at 22 ounces per square yard.
 - 3. The machine gauge shall be 1/2". Tufted pile height is 1-1/2".
 - 4. Total fabric weight shall be at least 88 ounces per square yard.
 - 5. The finished product should also include perforations to ensure drainage greater than 30 inches per hour. Non-perforated systems should not be acceptable alternates for purposes of this specification.

- D. The turf should be delivered in 15' wide rolls.
- E. All lines, numbers and markings indicated on plans should be permanently inlaid. Painted lines should not be an acceptable alternative for purposes of this specification.
- F. The fiber should be green in color to simulate natural grass as closely as possible and treated with UV inhibitor, guaranteed a minimum of eight years.
- G. The infill system should be an a non-expansive engineered coated, clean, dust free and specially sized silicon dioxide beads.
- H. Latex backed turf shall not be acceptable. All adhesives must also be latex free.

PART 3 – EXECUTION

3.1 SITE PREPARATION AND BASE

- A. The sub-base will have a slope per plan.
- B. The base aggregate should consist of a minimum of four inches (4") of ¾" Class 2 aggregate compacted to 95% and four inches (4") of ¾" Class 2 permeable aggregate base compacted to between 90%-95%.
- C. The sub base should be installed in two inch (2") lifts to appropriate thickness.
- D. The sub-base should be compacted using vibrating tamper, to approximately 95% Proctor density.
- E. The sub-base should no longer have any vegetation.
- F. Subgrade prior to aggregate installation: Sublevel grade is to be compacted prior to the ABC aggregate installation. Particular attention should be paid to areas of disturbed earth such as where footers for playground equipment enter the ground. Concrete used to fill said areas/footers should be poured to the top of sublevel surface.
- G. The sub-base installer and architect will accept the aggregate base in writing prior to the installation of the poured in place system.
- H. Any alterations must be agreed between all parties.

3.2 INSTALLATION

The synthetic turf safety surfacing installer should strictly adhere to the installation procedures outlined under these sections. Any variance from these requirements should be accepted in writing by the manufacturer's onsite representative and submitted to the architect/owner, verifying that the changes do not in any way affect the warranty.

A. Cushion Layer

1. The components of the poured in place safety surfacing should be mixed on site in a mixer to ensure a comprehensive mix according to manufacturer's instructions.
2. The cushion layer comprised of SBR buffings shall be mixed with the aromatic moisture cured polyurethane binder at a rate of 12% of the total weight of the material thoroughly so that the binder is evenly dispersed into the rubber base.
3. The cushion layer comprised of non-tire derived SBR & EPDM Chunk Rubber shall be mixed with the appropriate amount of urethane so that the binder is evenly dispersed into the rubber base.
4. The cushion layer mix should then be spread and troweled to the desired depth and allow to cure for 24 hours.

B. Synthetic Turf Layer

1. The synthetic grass should be cut and laid out across the area, and utilizing standard state-of-the-art gluing procedures, each roll should be seamed to the next.
2. The edge of the synthetic turf should be stapled or nailed to header/anchor board.
3. A strip of seam tape should be used to seam the rolls of material. The specified glue should be a one part urethane adhesive (SeamTight).

C. Infill

1. The infill material shall be spread evenly, at a rate of 2 lbs per square foot with a large fertilizer type spreader. The infill will be spread in strict accordance with the turf installer's specifications.
2. Between each application of infill, the field area should be brushed with a motorized rotary nylon broom.
3. Caution: Too much fiber exposed (not enough infill) will cause the fibers to mat or crush with heavy foot traffic. This will lead to premature wearing of the fiber and will void any manufacturer's warranty. No Crumb Rubber shall be used as infill.

END OF SECTION

DECORATIVE METAL FENCES AND GATES (MECHANICALLY FASTENED)
SECTION 32 3119.20
3595001

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Mechanically assembled decorative metal fences and gates.
 - 2. Gate hardware.
 - 3. Shop finishing.

1.2 RELATED REQUIREMENTS

- A. Section 32 1600, Site Concrete.

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CAL Green), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- C. ASTM International (ASTM):
 - 1. A 653/A 653M: Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy Coated (Galvannealed) by the Hot Dip Process.
 - 2. A 924/A 924M: Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot Dip Process.
 - 3. A 1011/A 1011M: Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength and High-Strength Low-Alloy with Improved Formability.
 - 4. B 117: Practice for Operating Salt Spray (Fog) Apparatus.
 - 5. D 523: Test Method for Specular Gloss.
 - 6. D 714: Standard Test Method for Evaluating Degree of Blistering of Paints.
 - 7. D 822: Practice For Conducting Tests On Paint and Related Coatings and Materials Using Filtered Open-Flame Carbon-Arc Light and Water Exposure Apparatus.
 - 8. D 1654: Test Method for Evaluation of Painted or Coated Specimens Subjected to Corrosive Environments.
 - 9. D 2244: Test Method for Calculation of Color Differences from Instrumentally Measured Color Coordinates.
 - 10. D 2794: Test Method for Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact).
 - 11. D 3359: Test Method for Measuring Adhesion by Tape Test.

DECORATIVE METAL FENCES AND GATES (MECHANICALLY FASTENED)
SECTION 32 3119.20
3595001

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Submittal Procedures:
 - 1. Action Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
 - 2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
- B. Coordinate installation of anchorages. Furnish setting drawings, diagrams, templates, and directions for installing anchorages, including sleeves, inserts, anchor bolts, and items with integral anchors, to be embedded in concrete.

1.5 ACTION SUBMITTALS

- A. Shop Drawings: Submit showing all parts, connections and anchorages, adjacent materials, fully dimensioned and noted.
 - 1. Indicate plan layout, spacing of components, locations and sizes of support structures, post foundation dimensions, hardware anchorage and schedule of components.
 - 2. Provide evidence that mounting plates, lock boxes, and similar items have been sized, located and coordinated properly with the finish hardware supplier and installer where applicable.
- B. Product Data: Submit list and complete descriptive data of all products and finishes proposed for use. Include manufacturer's specifications, published warranty, installation instructions, and maintenance instructions.
- C. Samples: Typical frame member, 12 inches long, finished as specified.

1.6 INFORMATIONAL SUBMITTALS

- A. Sample of manufacturer's warranty.

1.7 CLOSEOUT SUBMITTALS

- A. Warranty/Guarantee: Submit executed warranty and Subcontractor's guarantee.

1.8 QUALITY ASSURANCE

- A. Use only new materials and products.
- B. Use materials and products of one manufacturer.
- C. All materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.
- D. The Contractor shall provide laborers and supervisors who are thoroughly familiar with the type of construction involved and materials and techniques specified.

DECORATIVE METAL FENCES AND GATES (MECHANICALLY FASTENED)
SECTION 32 3119.20
3595001

1.9 DELIVERY, STORAGE AND HANDLING

- A. Deliver products to job in manufacturer's sealed containers and/or original bundles with tags and labels intact. Upon receipt at the job site, all materials shall be checked to ensure that no damage occurred during shipping or handling
- B. Store materials in weather protected, dry conditions off of ground and in areas so as to not interfere with the progress of the work.
- C. Transport, store and handle in strict accord with the manufacturer's written recommendations.

1.10 FIELD MEASUREMENTS

- A. Make and be responsible for all field dimensions necessary for proper fitting and completion of work. Report any discrepancies to Architect before proceeding.

1.11 WARRANTY

- A. Manufacturer: In addition to the Contractor's and Subcontractor's Guarantee, furnish Owner with manufacturer's fully executed written warranty for decorative metal fencing and gates against defects in materials, workmanship, and finish for 20 years.

PART 2 - PRODUCTS

2.1 DESIGN AND PERFORMANCE CRITERIA

- A. General:
 - 1. Use new components free from defects affecting service and appearance.
 - 2. Sizes specified or shown shall be considered minimum size.
 - 3. If modifications to designs indicated and specified are proposed in order to meet code requirements, indicate them as such on shop drawing submittals. Work with Architect to arrive at an acceptable design that is sufficiently similar to the design indicated.
- B. Structural Performance of Railing Assemblies and Guardrails:
 - 1. Top Rails of Guards:
 - a. Uniform load of 50 pounds/foot applied in any direction.
 - b. Concentrated load of 200 pounds applied in any direction.
 - c. Uniform and concentrated loads need not be assumed to act concurrently.
 - 2. Infill of Guards:
 - a. Concentrated load of 50 pounds applied horizontally on an area of 1 square foot.
 - b. Infill load and other loads need not be assumed to act concurrently.
- C. Industry Standards:

DECORATIVE METAL FENCES AND GATES (MECHANICALLY FASTENED)
SECTION 32 3119.20
3595001

1. Comply with "Metal Rail Manual" of National Ornamental and Miscellaneous Metals Association (NOMMA).

2.2 DECORATIVE METAL FENCING AND GATES

- A. Fence and Gate System: Industrial ornamental steel fence with flush top rail, standard picket spacing, and 3-rail panels; "Montage II ATF (All Terrain Flexibility)" "by Ameristar Fence Products, Tulsa, OK, or equal.

1. Design: "Majestic" with flush bottom rail.

2.3 MATERIALS AND COMPONENTS

- A. Steel material for fence panels and posts shall conform to the requirements of ASTM A 653/A 653M, with a minimum yield strength of 45,000 psi with a G-90 hot-dip galvanized zinc coating.

- B. Line and Corner Posts: 12 gauge steel tubing, 3 inches square.

- C. Pickets: 14 gauge steel tubing, 1 inch square.

- D. Rails: 12 gauge steel channel, 1.75 inches wide x 1.75 inches high.

1. Cross sectional shape of the rails shall be steel channel, with the outside cross-sectional dimensions of 1.75" x 1.75" x 1.05".
2. Picket holes in the rail shall be spaced at 4.715 inches on center.

- E. Gate Posts:

1. Gate Leaf Width Up to 4'-6": 4-inches square, 11-gauge tubular steel.
2. Gate Leaf Width 4'-6" and less than 7"-6": 4 inches square steel tubing with 1/4 inch wall thickness.
3. Gate Leaf Width 7'-6" and Wider: 6 inches square steel tubing with 1/4 inch wall thickness.
4. Gate post size to be same on both sides of gate.
5. Grout solid hinge side gate posts at posts 4 inch x 1/4 inch wall thickness and larger.

- F. Hardware:

1. Gates over 4'-6" in width shall have a minimum of 3-heavy duty barrel hinges per leaf.
2. Provide a hasp at 42 inches above grade at double leaf gates, suitable for use with a padlock.
3. All hardware shall meet CBC and ADA requirements for accessibility. When in conflict, comply with the most stringent.
4. At Accessible gates also provide:
 - a. Exit Device: Von Duprin CD-PA-99_NL-06-WH.

DECORATIVE METAL FENCES AND GATES (MECHANICALLY FASTENED)
SECTION 32 3119.20
3595001

- b. 1 set hinges: self closing Mammoth hinges.
 - c. 1 each: Rim cylinder 20-057 ICX 626 SCH.
 - d. 2 each: FISC core 23-030 626 SCH.
 - e. 1 each: Mortise cylinder 26-091 ICX XQ11-848 626 SCH.
- G. Security Screen: 16-gauge, galvanized and perforated steel sheet with 1/8-inch holes staggered at 3/16-inches on center, welded to the fabricated gate or fence panel assembly, hot-dip galvanized.

2.4 FABRICATION

- A. Pickets, rails, and posts shall be precut to specified lengths. Rails shall be pre-punched to accept pickets.
- B. Pickets shall be inserted into the pre-punched holes in the rails and shall be aligned to standard spacing using a specially calibrated alignment fixture. Each picket and rail shall be joined using the fusion welding process thus completing the rigid panel assembly.
- C. Completed panels shall be capable of supporting a 600 pound load applied at midspan without permanent deformation. Panels shall be biasable to a 25 percent slope in grade.
- D. Gates:
 - 1. Fabricate using manufacturer's standard materials and components except uprights shall be 11 gauge, 2 inch square tubing.
 - 2. Rail and upright intersections shall be joined by welding.
 - 3. Picket and rail intersections shall be joined by the same welding process used for panel assembly.
 - 4. Self-closing gates to comply with CBC and ADA Guidelines for Accessible Design, section 404.2.8.2.

2.5 PROTECTIVE PAINT COATINGS

- A. Shop Applied Coating System: The manufactured galvanized panels, gates and posts shall receive a multi-stage pretreatment/wash with zinc phosphate followed by a duplex application of epoxy primer and an acrylic topcoat to create a total coating thickness of 2-mils; "E-Coat" by Ameristar Fence Products, Inc., or equal meeting the following performance criteria:

QUALITY CHARACTERISTICS	ASTM TEST METHOD	PERFORMANCE REQUIREMENTS
Adhesion:	D 3359 – Method B	Adhesion (Retention of Coating) over 90% of test area (Tape and knife test).
Corrosion Resistance:	B 117, D 714 and D 1654	Corrosion Resistance over 1,500 hours (Scribed per D 1654; failure mode is accumulation of 1/8" coating)

DECORATIVE METAL FENCES AND GATES (MECHANICALLY FASTENED)
SECTION 32 3119.20
3595001

QUALITY CHARACTERISTICS	ASTM TEST METHOD	PERFORMANCE REQUIREMENTS
		loss from scribe or medium #8 blisters).
Impact Resistance:	D 2794	Impact Resistance over 60 inch lb. (Forward impact using 0.625" ball).
Weathering Resistance:	D 822, D 2244, and D 523 (60° Method)	Weathering Resistance over 1,000 hours (Failure mode is 60% loss of gloss or color variance of more than 3 delta-E color units)

- B. Color: Black or bronze, as selected by the Architect.
- C. Exposed fastenings shall be finished to match.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine the conditions under which the fencing is to be installed for conditions detrimental to the proper and timely completion of the work. Work shall not proceed until unsatisfactory conditions have been corrected.
- B. Take field measurements and notify the Architect of any discrepancies between the Drawings and field dimensions.

3.2 INSTALLATION

- A. install mechanically fastened metal fencing system in accordance with manufacturer's requirements, industry standard and best practices.
- B. Upon receipt at job site, materials shall be checked to ensure that no damage occurred during handling or shipping. Contractor shall repair or replace material at no additional cost to the Owner.
- C. Fence posts shall be set in accordance with the spacing recommended by the manufacturer.
- D. Panels shall be attached to posts with brackets as supplied by the manufacturer.
- E. Gate posts shall be spaced according to the gate openings indicated on the Drawings and reviewed submittals.
- F. Dig post holes in firm, undisturbed compacted soil.
 - 1. Footing shall be sized as required by the manufacturer.
 - 2. Concrete shall conform to the requirements specified in be as specified in Section 32 1600, Site Concrete.

DECORATIVE METAL FENCES AND GATES (MECHANICALLY FASTENED)
SECTION 32 3119.20
3595001

- G. Install posts and panel sections plumb and level.
- H. Install gates plumb, level and secure for a full opening without interference.
- I. Install in-ground sleeves flush to grade at both closed and open positions to accept cane bolts
- J. Adjust hardware for smooth operation.
- K. Touch up field abrasions and damage to factory-painted finish.
 - 1. Touch-up shall be unnoticeable in completed installation.
 - 2. Touch-up components determined as unacceptable by the Architect shall be replaced at no additional cost to Owner.

END OF SECTION

p:\sacramento\3595 tracy unified school district\001-000_villalovoz es new shade structures\08 specifications\06 spec\04 final\freiler - shade struct\32 3119.20_decorative metal fences and gates (mechanically fastened).docx
Last Updated: April 6, 2021

PART 1 - GENERAL

1.1 SUMMARY

A. Scope of Work:

1. Furnish all labor, materials, tools, equipment, and transportation required to perform and complete the installation of an automatic sprinkler irrigation system, including all piping, sprinkler heads, controls, connections, testing, etc. as shown on the Drawings and as specified herein. The water source for this project is potable water.
2. Utilize and accept as standards manufacturer's recommendations and/or installation details for any information not specifically detailed on the Drawings.

1.2 RELATED REQUIREMENTS

- A. Section 01 6116, Volatile Organic Compound (VOC) Restrictions, for VOC limits pertaining to adhesives, sealants, fillers, primers, and coatings.
- B. Section 01 8113, Sustainable Design Requirements, for CAL-Green general requirements and procedures.
- C. Section 31 0000, Earthwork.
- D. Section 31 2333, Trenching and Backfilling.
- E. Section 32 9000, Landscaping.

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CALGreen), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).

1.4 ADMINISTRATIVE REQUIREMENTS

A. Submittal Procedures:

1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
3. Sustainable Design Submittals shall comply with the additional requirements of Section 01 8113, Sustainable Design Requirements

**IRRIGATION
SECTION 32 8000
3595001**

B. Pre-Installation Meeting:

1. Request and hold a pre-installation meeting prior to beginning the work of this Section. Parties required to be in attendance are the Landscape Contractor, Project Inspector, Owner's Representative, and the Landscape Architect.

1.5 ACTION SUBMITTALS

- A. Product names are used as standards; provide proof as to equality of any proposed material and do not use other materials or methods unless approved in writing by the Owner's Representative. Submit no more than one request for substitution for each item. The decision of the Owner's Representative is final.
- B. Use equipment capacities specified herein as the minimum acceptable standards.
- C. List materials in the order in which they appear in Specifications; include substitutions. Submit the list for approval by the Owner's Representative.
- D. Make any mechanical, electrical, or other changes required for installation of any approved, substituted equipment to satisfaction of Owner's Representative and without additional cost to Owner. Approval by Owner's Representative of substituted equipment and/or dimensional drawing does not waive these requirements.
- E. Do not construe approval of material as authorization for any deviations from Specifications unless attention of Owner's Representative has been directed to specified deviations.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data for the following:
 1. For landscape contractor.
- B. Sample of manufacturers' warranty.
- C. Record of Pre-Installation Meeting.
- D. Sustainable Design:
 1. General:
 - a. Submit information necessary to establish and document compliance with the California Green Building Standards Code.
 - b. Sustainable design submittals are in addition to other submittals.
 2. The following information shall be provided:
 - a. Adhesives and Sealants: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.
 - b. Paints and Coatings: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.

1.7 CLOSEOUT SUBMITTALS

- A. Warranty/Guarantee: Submit executed warranty and subcontractor's guarantee.
- B. Maintenance and Operating Instructions:
 - 1. Furnish operating maintenance instructions bound in a hardback binder and indexed. Start compiling data upon approval of list of materials. Do not request final inspection until booklets are approved by Owner's Representative.
 - 2. Incorporate the following information in these sets:
 - a. Complete operating instructions for each item of irrigation equipment.
 - b. Typewritten maintenance instructions for each item of irrigation equipment.
 - c. Manufacturer's bulletins which explain installation, service, replacement parts, and maintenance.
 - d. Service telephone numbers and/or addresses posted in an appropriate place as designated by Owner's Representative.
- C. Record Drawings.

1.8 QUALITY ASSURANCE

- A. Qualifications: Work must be complete by a licensed Landscape Contractor. Provide proof of five years' continuous experience in landscaping and irrigation of projects of similar size.
- B. Certification: Ensure that the contractor installing the Central Control System is trained and certified in the installation of the Central Control System. The training and certification must have been completed within two years prior to the installation date.
- C. Work Force: Ensure that an experienced foreman is present at all times during installation. Keep the same foreman and workers on the job from commencement to completion.
- D. Reviews: Specifically request reviews of all items listed in Article INSPECTION REQUIREMENTS, prior to progressing to the next level of work.
- E. Standards:
 - 1. Provide work and material in full accordance with the rules and regulations of the National Electric Code; the Uniform Plumbing Code; and other applicable state or local laws or regulations.
 - 2. Furnish, without extra charge, additional material and labor required to comply with these rules and regulations, though the work may not be specifically indicated in the Specifications or Drawings.
 - 3. Where the Specification requirements exceed those of the above-mentioned codes and regulations, comply with the requirements in the Specifications.

1.9 DELIVERY, STORAGE AND HANDLING

- A. Transport, store and handle in strict conformance with the manufacturer's written recommendations.
- B. Deliver undamaged products to job in manufacturer's sealed containers and/or original bundles, with tags and labels intact. All material containers or certificates shall be clearly marked by manufacturer as to contents for inspection.
- C. Store materials in original undamaged packages and containers, inside well-ventilated area protected from weather, moisture, soilage, extreme temperatures, and humidity. Lay flat, blocked off ground.
- D. Use all means necessary to protect irrigation system materials before, during, and after installation and to protect related work and material.
- E. Handle plastic pipe carefully, especially protecting it from prolonged exposure to sunlight. Store pipe on beds that are the full length of the pipe, and keep pipe flat.

1.10 FIELD CONDITIONS

- A. Information on Drawings relative to existing conditions is approximate. During progress of construction, make deviations necessary to conform to actual conditions, as approved by Owner's Representative, without additional cost to Owner. Accept responsibility for any damage caused to existing services. Promptly notify Owner's Representative if services are found which are not shown on Drawings.
- B. Protect existing trees-to-remain as specified in "Existing Tree Protection" in Article PREPARATION, in Part 3 of this Section.
- C. Protect existing utilities within construction area. Repair damages to utility lines that occur as a result of operations of this work.
- D. Verify dimensions at building site and check existing conditions before beginning work. Make changes necessary to install work in harmony with other crafts after receiving approval by Owner's Representative.

1.11 INSPECTION REQUIREMENTS

- A. Obtain verification from Project Inspector for the following at the appropriate times during construction and prior to further progression of work in this Section:
 - 1. Pressure testing of all mainlines and lateral lines (See "Hydrostatic Tests – Open Trench" in Article FIELD QUALITY CONTROL, in Part 3 of this Section),
 - 2. Trench depth,
 - 3. Sleeves under pavement,
 - 4. Flushing of all mainlines and lateral lines,
 - 5. Backfill and pipe bedding,

- 6. Layout of heads,
 - 7. Operation of system and coverage adjustments (with Landscape Architect) after system is fully automated and operational, backfill of trenching is completed, and surface has been restored to original grades.
- B. In case of failure to obtain any verification by the Project Inspector as required above, remove and replace work as necessary to obtain the verification at no additional cost to the Owner.

1.12 WARRANTY AND GUARANTEE

- A. Manufacturer: In addition to the Contractor's and Subcontractor's Guarantee, furnish Owner with manufacturer's available fully executed written warranty against defects in materials and workmanship.
- B. Subcontractor Guarantee: Shall include damage by leaks and settlement of irrigation trenches.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Use materials as specified; any deviation from the Specifications must first be approved by the Owner's Representative in writing.

2.2 DESIGN AND PERFORMANCE CRITERIA

- A. Sustainable Design:
 - 1. VOC emissions for field-applied adhesives, sealants, and sealant primers must comply with limits specified in Section 01 6116.
 - 2. VOC emissions for field-applied paints and coatings must comply with limits specified in Section 01 6116.

2.3 MATERIALS

- A. Automatic Control Valves: As indicated on Drawings.
- B. Gate Valve: As indicated on Drawings.
- C. Pipe and Fittings:
 - 1. PVC pipe: As indicated on Drawings.
 - 2. PVC fittings three-inch (3") size and smaller: High impact, standard weight, Schedule 40, molded PVC as manufactured by George Fischer, Lasco, Spears, or approved equal.

IRRIGATION
SECTION 32 8000
3595001

3. PVC fittings four-inch (4") size and larger: High impact, standard weight, Class 200 gasketed, molded PVC as manufactured by George Fischer, Lasco, Spears, or approved equal.
 4. All plastic pipe and fittings: Continuously and permanently marked with manufacturer's name, type of material, IPS size, schedule, NSF approval, and code number.
 5. Threaded PVC pipe and nipples: IPS Schedule 80 when necessary to use threaded connections to gauges, valves, or control valves. Threaded adapters may be used in place of nipples when making pipe to valve connections.
 6. Use 45-degree fittings for changes in depth of pipe, and at transition from main line to automatic control valves.
 7. Piping above ground: Schedule 40 galvanized steel with cast-iron fittings.
- D. PVC Primer: Weld-On P-70 Purple Primer or approved equal.
- E. PVC Glue: Weld-On 711 Gray heavy bodied PVC Cement or approved equal.
- F. Sprinkler Heads: As indicated on Drawings.
- G. Quick Coupler Valves: As indicated on Drawings.
- H. Sleeves: As indicated on Drawings.
- I. All Valve Boxes and Covers: Manufactured, green with "Irrigation – Non-Potable" permanently embossed on cover. Carson, Rainbird or approved equal.
- J. Reduced Pressure Backflow Preventer: As indicated on Drawings.
- K. Automatic Sprinkler Control Wire:
1. Connections between remote control valves and controller: UF-14 direct burial polyethylene (PE) insulated wire, Paige Electric P7079D or approved equal. Common wire to be white, and lead wire to be colored. If multiple controllers are used, a different color is to be used for each controller's lead wire. (Use red for the first controller). Spare wires are to be yellow.
 2. UL Listed waterproof sealing pack for wire connections: 3M DBR/Y-6, or approved equal.
 3. Provide adequate working space around electrical equipment in compliance with local codes and ordinances.
 4. Electrical, other than low voltage, such as power wiring, conduit, fuses, thermal overloads and disconnect switches, is included under Division 26 of these Specifications.
- L. Unions And Flanges:
1. Steel unions and flanges two inches (2") and smaller: 150 lb. screwed black (brass to iron seat) or galvanized malleable iron (ground joint).

2. Steel unions and flanges two and one-half inches (2 ½") and larger: 150 lb. black flange union, flat-faced, full gasket.
 3. Gaskets: One-sixteenth inch (1/16") thick rubber Garlock No. 122, Johns-Manville or approved equal.
 4. Flange Bolts: Open-hearth bolt steel, square heads with cold pressed hexagonal nuts, cadmium plated in ground. Provide copper-plated steel bolts and nuts or brass bolts and nuts for brass flanges.
- M. Sand for Trench Backfill: Natural sand, free of roots, bark, sticks, rags, or other extraneous material

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Prior to commencement of the work of this Section, obtain written verification from the project Civil Engineer that the rough grade in landscape areas is in conformance with Section 31 0000 - Earthwork.
- B. Examine conditions of work in place before beginning work; report defects.

3.2 PREPARATION

- A. Scheduling: Notify the Project Inspector prior to commencing and/or continuing the work of this Section. Remove and replace, at no cost to Owner, any work required as a result of failure to give the appropriate notification.
- B. Measurements: Take field measurements; report variance between plan and field dimensions.
- C. Protection: Maintain warning signs, shoring and barricades as required. Prevent injury to, or defacement of, existing improvements. At no additional cost to Owner, repair or replace items damaged by installation operations.
- D. Existing Tree Protection:
 1. Avoid unnecessary root disturbance, compaction of soils within drip line, or limb breakage.
 2. Do not store material or dispose of any material other than clean water within the drip line.
 3. Provide adequate irrigation during construction.
 4. Replace any tree damaged during construction with a tree of equal size and value at no additional cost to Owner.
 5. Adjust trench locations in field to minimize damage to existing elements and plant roots of trees-to-remain at no additional cost to Owner.

IRRIGATION
SECTION 32 8000
3595001

- E. Surface Preparation: Prior to beginning sprinkler irrigation work, complete placement of topsoil as specified in Section 31 0000 – Earthwork. Notify Project Inspector of irregularities if any.

3.3 AUTOMATIC CONTROLLER

- A. Connect automatic control valves to controller(s) in sequence as shown on Drawings.
- B. Install all exposed wires to a minimum of twenty-four inches (24") beyond controller within a UL approved rigid conduit.

3.4 GRADING

- A. Install all irrigation features to their finished grade and at depths indicated. Complete and /or accommodate all rough grading and/or finish grading before commencing with trenching.

3.5 LAYOUT

- A. Lay out work as accurately as possible to Drawings. Drawings are generally diagrammatic to extent that swing joint offsets and fittings are not shown. Record all changes on the Record Drawings.
- B. Do not willfully install the irrigation system as shown on Drawings when it is obvious, in the field, that obstructions or other discrepancies exist which may not have been considered in the design. Notify Owner's Representative of discrepancies before proceeding.

3.6 EXCAVATING AND TRENCHING

- A. General: Perform excavations as required for installation of work included under this Section, including shoring of earth banks to prevent cave-ins. Restore surfaces, existing underground installations, etc., damaged or cut as result of this work to their original condition and in a manner approved by the Landscape Architect.
- B. Width:
 - 1. Make trenches wide enough to allow a minimum of six inches (6") between parallel pipelines and three inches (3") between side of pipe and side of trench. Do not allow stacking of pipe within trench.
 - 2. Allow a minimum clearance of twelve inches (12") in any direction from parallel pipes of other trades.
- C. Preparation of Excavations: Remove rubbish and rocks from trenches. Bed pipe on a minimum of three inches (3") of clean, rock-free soil to provide a firm, uniform bearing for entire length of pipeline. If clean, rock-free soil is not available, use sand for pipe bedding. See Backfill and Compacting for the remainder of the trench backfill.

- D. Minimum depth of cover: Unless shown otherwise, provide the following minimums:
 - 1. Mainline: twenty-four inches (24") cover.
 - 2. Lateral line: twelve inches (12") cover for spray heads, and eighteen inches (18") cover for rotor heads.
- E. Conflicts with other trades:
 - 1. Hand-excavate trenches where potential conflict with other underground utilities exist.
 - 2. Where other utilities interfere with irrigation trenching and piping work, adjust the trench depth as instructed by Owner's Representative.

3.7 BACKFILL AND COMPACTING

- A. General: Do not begin until hydrostatic tests are completed and when system is operating and after required tests and inspections have been made.
- B. Backfill directly around the pipe: Cover pipe with a minimum of three inches (3") of clean, rock-free soil. If clean, rock-free soil is not available, use sand for three inches (3") of backfill above the pipe. The remainder of the trench backfill material can be native soil or material described below. Do not allow wedging or blocking of pipe.
- C. For backfill of trenches under paving areas:
 - 1. See Section 31 0000 – Earthwork for compaction rates and material
 - 2. See Section 31 2333 – Trenching and Backfilling for trench backfill procedure.
- D. For backfill of trenches in landscape areas:
 - 1. Place backfill in six-inch (6") layers and compact with an acceptable mechanical compactor.
 - 2. Compact backfill material in landscape areas to eighty-five percent (85%) maximum dry density of the soil.
 - 3. If settlement occurs along trenches, make adjustments in pipes, valves, and sprinkler heads, soil, sod or paving as necessary to bring the system, soil, sod or paving to the proper level or the permanent grade, without additional cost to the Owner.
- E. Excess Soil: Remove all rocks, debris, and excess soil that results from sprinkler irrigation trenching operations, landscape planting, and soil preparation operations off site at no additional cost to the Owner. If soil meets topsoil requirements in Section 31 0000 – Earthwork, it may be used for finish grading.
- F. Finishing: Dress-off areas to eliminate construction scars.

IRRIGATION
SECTION 32 8000
3595001

3.8 CONTROL WIRES

- A. General: Install control wires beneath sprinkler main line whenever possible; tape wires to mainline pipe. Provide one spare wire for each controller.
- B. Slack Wire: Provide eighteen inches (18") of slack wire for each wire connected to automatic control valve. Slack wire shall be coiled and left in the valve box. Tape wires in bundles every ten feet (10'); do not tape wires in sleeves.
- C. Expansion and Contraction: Snake wire in trench to allow for contraction of wire.
- D. Wire Passing Under Existing or Future Paving or Construction: Encase in PVC Schedule 40 or galvanized steel conduit extending at least twelve inches (12") beyond edges of paving or construction.
- E. Wire Connections: Install wire connections in a waterproof sealing pack.
- F. Wire Splicing: Permit splicing only on runs exceeding 500 feet. Locate all splices within valve boxes.
- G. Wire Termination: Install wire in a valve box with eighteen inches (18") of slack wire coiled and individually capped with approved waterproof sealing pack.
- H. Spare Wire: Install two (2) spare wires along each wire path. If there is more than one wire path from the controller, the contractor to install two (2) spare wires per path. Provide eighteen inches (18") of slack wire at each automatic control valve.

3.9 FLUSHING LINES

- A. Thoroughly flush lines prior to installing valves, performing hydrostatic testing, or installing sprinklers. Divert water to prevent washouts.

3.10 AUTOMATIC CONTROL AND QUICK COUPLER VALVES

- A. Install where shown and where practical; place no closer than twelve inches (12") to walk edges, building walls, or fences. Refer to detail for example.
- B. Thoroughly flush mainline before installing valve.
- C. Install valves in ground cover areas where possible.

3.11 PIPING

- A. General: Install in conformance with reference standards, manufacturer's written directions, as shown on Drawings and as herein specified.
- B. Workmanship:
 - 1. General: Install sprinkler irrigation equipment in planted areas throughout the site.
 - 2. Coordination: Organize location of sleeves with other trades as required.

C. Pipe Line Assembly:

1. General:
 - a. Cutting: Cut pipe square; remove rough edges or burrs.
 - b. Solvent-welded Connections: Use materials and methods recommended by the pipe manufacturer.
 - c. Brushes: Use non-synthetic brushes to apply solvents and primer.
 - d. Cleaning: Clean pipe and fittings of dirt, moisture, and debris prior to applying solvent or primer.
 - e. Assembly: Allow pipe to be assembled and welded on the surface or in the trench.
 - f. Expansion and Contraction: Snake pipe from side to side of trench to allow for expansion and contraction.
 - g. Location: Locate pipes as shown on Drawings except where existing supply valves, utilities or obstructions prohibit or where slight changes are approved to better suit field conditions.
2. Flexible Elastometric Seal Joints:
 - a. General: Assemble in strict conformance with the pipe manufacturer's instruction.
 - b. Rubber Rings: Use rubber rings specific for water service systems.
 - c. Cleaning: Thoroughly clean ring and groove of dirt, moisture and debris using a clean, dry cloth. Do not use solvents, lubricants, cleaning fluids or other material for cleaning.
 - d. Seating: Properly seat ring in groove.
 - e. Spigot:
 - 1) General: Clean spigot-end of pipe as in "Cleaning" above prior to applying lubricant recommended by pipe manufacturer.
 - 2) Seating: Insert spigot into bell and seat to full depth required.
3. Connections:
 - a. Threaded Plastic Pipe Connection:
 - 1) Use Teflon tape or pipe joint compound.
 - 2) When assembling to threaded pipe, take up joint no more than one full turn beyond hand-tight.
 - b. Metal Valves and Plastic Pipe: Use threaded plastic male adapters.
 - c. Metal to Metal Connections:
 - 1) Use specific joint compound or gasket material for type of joint made. Where pipe of dissimilar metals are connected, use dielectric fittings.
 - 2) Where assembling, do not allow more than three full threads to show when joint is made up.
 - d. Where assembling soft metal (brass or copper) or plastic pipe, use strap-type friction wrench only; do not use a metal-jawed wrench.
 - e. Threading:

**IRRIGATION
SECTION 32 8000
3595001**

- 1) Do not permit the use of field-threading of plastic pipe or fittings. Use only factory-formed threads.
 - 2) Use factory-made nipples wherever possible. Permit the use of field-cut threads in metallic pipe only where absolutely necessary. When field-threading, cut threads accurately on axis with sharp dies.
 - 3) Use pipe joint compound for all threaded joints. Apply compound to male thread only.
4. Sleeves and conduits:
- a. Use sleeves of adequate size to accommodate retrieval for repair of wiring or piping and extend a minimum of twelve inches (12") beyond edges of walls or paving.
 - b. Provide removable, non-decaying plug at end of sleeve to prevent entrance of soil.
5. Unions: Locate unions for easy removal of equipment or valve.
6. Capping: Plug or seal opening as lines are installed to prevent entrance materials that would obstruct pipe. Leave in place until removal is necessary for completion of installation.

3.12 SPRINKLER HEADS

- A. Sprinkler heads: Locate as shown on the Drawings except where existing conditions prohibit, or slight changes are approved to achieve as good or better coverage under the same conditions. Do not allow sprinkler head spacing to exceed the maximum shown on the Drawings. Plumb heads.
- B. Handling, Assembly of Pipe, Fittings, and Accessories: Allow only skilled tradesmen to handle and assemble pipe, fittings and equipment. Keep interior of pipes, fittings and accessories clean at all times. Close ends of pipe immediately after installation; leave closure in place until removal is necessary for completion of installation. Do not permit bending of pipe.
- C. Flushing: Remove end heads and operate system at full pressure until all rust, scale, and sand is removed. Divert water to prevent ponding or damage to finished work.
- D. Coverage: Accept responsibility for full and complete coverage of irrigated areas to satisfaction of Landscape Architect and make necessary adjustments to better suit field conditions at no additional costs to Owner.

3.13 FIELD QUALITY CONTROL

- A. Visual Inspection: Verify that all pipe is homogenous throughout and free from visual cracks, holes, or foreign materials. Inspect each length of pipe. All materials are subject to impact test at the discretion of the Landscape Architect.

B. Hydrostatic Tests – Open Trench:

1. Center-load piping with a small amount of backfill to prevent arching or slipping under pressure.
2. Request the presence of the Project Inspector in writing at least forty-eight hours in advance of testing.
3. At no additional cost to Owner, test in the presence of the Project Inspector.
4. Apply continuous static water pressure of 100 psi when welded plastic joints have cured at least twenty-four hours, and with the risers capped, as follows: test main lines and submains for four hours; test lateral lines for two hours.
5. Repair leaks resulting from tests; and repeat tests.
6. Test to determine that all sprinkler heads function according to manufacturer's data and give full coverage according to intent of Drawings. Replace any sprinklers not functioning as specified with ones that do, or otherwise correct system to provide satisfactory performance.

C. Continuity Testing: Test locating device and control wires for continuity prior to and after back-filling operations.

3.14 CLEAN-UP

- A. Remove debris resulting from work of this Section.**

3.15 ADJUSTMENTS AND MAINTENANCE

- A. Adjusting System:** Prior to acceptance, satisfactorily adjust and regulate entire system. Set watering schedule on controller appropriate to types of plants and season of year. Adjust remote control valves to operate sprinkler heads at optimum performance based on pressure and simultaneous demands through supply lines.
- B. System Layout:** Provide reduced prints of Record Document irrigation plans, laminated in four (4) mil. plastic, of size to fit controller door. Enlarge remote-control valve designations as necessary for legibility. Color-code areas covered by each station. Affix plans to inside of controller door.
- C. Instructions:** Upon completion of work, instruct maintenance personnel on operation and maintenance procedures for entire system.
- D. Flow Charts:** Record and prepare an accurate flow-rate chart for each automatic control valve.

3.16 RECORD DRAWINGS

- A. As specified in Section 01 3300, Submittal Procedures, and the following:**
1. Regularly update plans of the system and any changes made to the system throughout the project. Record all changes on this plan before trenches are back-filled.

**IRRIGATION
SECTION 32 8000
3595001**

2. Record complete as-built information and submit the Record Drawings to the Architect before applying for payment for work installed.
3. Show the following on the Record Drawings accurately to scale and dimensioned from two permanent points of reference:
 - a. and spares Distance of mainline from nearby hardscape.
 - b. Location of automatic control valves, quick couplers, and gate valves.
 - c. Location and size of all sleeves.
 - d. Location of automatic control wires.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Soil Preparation and Fertilization
 - 2. Planting
 - 3. Weed Control
 - 4. Mulch
 - 5. Clean-up
 - 6. Landscape Maintenance Period
- B. Work not included in this Section: Landscape elements such as concrete walks, fencing, outdoor lighting, rough grading, and clearing are not a part of this Section unless shown on the landscape Drawings.

1.2 RELATED REQUIREMENTS

- A. Section 31 0000, Earthwork.
- B. Section 32 8000, Irrigation

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CALGreen), edition as noted on the drawings, as adopted by the California Division of the State Architect (DSA).
- C. EPA - Federal Insecticide, Fungicide and Rodenticide Act.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Submittal Procedures:
 - 1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
 - 2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.

LANDSCAPING
SECTION 32 9000
3595001

- B. Pre-Installation Meeting: Request and hold a pre-installation meeting prior to beginning the work of this Section. Parties required to be in attendance are the Landscape Contractor, Project Inspector, Owner's Representative, and Landscape Architect.
- C. Pre-scheduled On-site Project Meetings: Hold regularly-scheduled (monthly or bimonthly as determined by the Landscape Architect) on-site project meetings with the Landscape Architect, Project Inspector and Owner's Representative. Dates and times will be jointly agreed upon.

1.5 ACTION SUBMITTALS

- A. Plant Material: Within fifteen (15) days after award of contract, locate plant materials required for construction. Ensure that trees and shrubs are contract- grown from a certified nursery. Notify Owner's Representative of plant material "tied off" for review at selected nursery. If specified material is not obtainable, submit the following to Owner's Representative: proof of non-availability, proposal for use of equivalent material, photographs of alternative choices of plant material. Include clear, written description of type, size, condition, and general character of plant material.
- B. Data Sheets:
 - 1. Provide product data for each type of landscape material indicated in the Drawings and Specifications.
 - 2. Letter from the manufacturer stating that the soil amendment material submitted for use on this project has no metal fragments or foreign objects.
- C. Samples: Submit samples of the following materials to Landscape Architect for approval:
 - 1. Soil amendment: (3) one-quart zip-locked plastic bags.
 - 2. Bark Mulch: (3) one-quart zip-locked plastic bags.
 - 3. Imported Topsoil: (3) one-quart zip-locked plastic bags.
- D. Provide soils analysis reports prepared by a qualified soils laboratory in accordance with the Soils Testing Requirements under "Soil Testing" in Article SOIL TESTING, in Part 3 of this section.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For landscape contractor.
- B. Prior to planting, submit copies of all trucking or packaging tags for all soil amendment, fertilizer and other additives to Landscape Architect so the quantities can be verified.
- C. Record of Pre-Installation Meeting.

1.7 CLOSEOUT SUBMITTALS

- A. Guarantee: Submit Subcontractor's guarantee.
- B. Record Drawings.

1.8 QUALITY ASSURANCE

- A. Qualifications: Work must be completed by a licensed Landscape Contractor. Provide proof of five years of continuous experience in landscaping and irrigation of projects of similar size (+/- 20% of the construction cost) and scope for education campuses. Landscape Contractor to have a minimum of two projects either completed or in construction in the last five years.
- B. Work Force: Ensure that an experienced foreman is present at all times during installation. Keep the same foreman and workers on the job from commencement to completion.
- C. Reviews: Specifically request reviews of all items listed below in Article INSPECTION REQUIREMENTS prior to progressing to the next level of work. The Owner's Representative reserves the right to inspect and reject material, both at place of growth and at site, before and/or after planting, for compliance with requirements for name, variety, size and quality.
- D. Reference Standards: Meet or exceed Federal, State and County laws requiring inspection of all plants and planting materials for plant disease and insect control.
- E. Plant Material:
 - 1. Conform to the current edition of Horticultural Standards for quality of Number 1 grade nursery stock as adopted by the American Association of Nurserymen. Conform to sizes specified on plant legend. Select plants which have a natural shape and appearance.
 - 2. Select only plants that are true to name, and tag one of each bundle or lot with the name of the plant in accordance with the standards of practice of the American Association of Nurserymen. In all cases, botanical names shall take precedence over common names.
 - 3. Tag each plant of a patented variety with the variety and identification number, where applicable, as it is delivered to the job site.
 - 4. Select only plants which have been nursery-grown in accordance with good horticultural practices and which have been grown under climatic conditions similar to those in the locality of the project for at least one year.
 - 5. Select only plants which are typical of their species or variety; have normal habits of growth; are sound, healthy, vigorous, well-branched and densely-foliated when in leaf; are free of disease, insect pests, eggs or larvae; and have a healthy and well-developed root system.

LANDSCAPING
SECTION 32 9000
3595001

6. Do not use plants that are severely pruned or headed-back to meet size requirements.
7. Do not plant container-grown plants that have cracked or broken balls of earth when taken from the container. Remove canned stock carefully from cans after containers have been cut on two sides with tin snips or other approved cutter.
8. At any time prior to final acceptance, be prepared to replace any plants that are rejected by the Owner's Representative because of physical damage to the plant.
9. Do not remove container-grown stock from containers before time of planting.
10. Furnish quantities necessary to complete the work as shown on the Drawings and, if necessary, make up for any discrepancies in the quantities given in the Plant List at no additional cost to Owner.

1.9 DELIVERY, STORAGE AND HANDLING

- A. Packaged Materials: Deliver packaged materials in original, unopened containers showing weight, certified analysis, name and address of manufacturer, and indication of conformance with state and federal laws if applicable.
- B. Coordinate a time for the Landscape Architect to inspect the plants upon their delivery to the project site.
- C. Bulk Materials:
 1. Do not dump or store bulk materials near structures, utilities, walkways or pavements, or on existing turf areas or plants.
 2. Provide erosion-control measures to prevent erosion or displacement of bulk materials, discharge of soil-bearing water runoff, and airborne dust reaching adjacent properties, water conveyance systems, or walkways.
 3. Accompany each delivery of bulk fertilizers and soil amendments with appropriate certificates.

1.10 FIELD CONDITIONS

- A. Planting Season Limits: Do not plant when grounds are wet or temperature is below 25° F. Do not proceed with any soil preparation and fertilization if all planting cannot be completed within Planting Season Limit.

1.11 INSPECTION REQUIREMENTS

- A. Landscape Architect reserves the right to examine and reject plant material both at place of growth and at site, before and after planting, for compliance with requirements of name, variety, size, and quality.

- B. Obtain verification from Project Inspector for the following at the appropriate times during construction and prior to further progression of work in this Section:
1. Rough grading is to tolerances specified in Section 31 0000 – Earthwork.
 2. The placement of landscape backfill material is as specified in this Section.
 3. Prior to the commencement of planting operations specified in this Section, the coverage and operation of the sprinkler irrigation system are as specified in Section 32 8000 - IRRIGATION.
 4. Required Test: For each load of soil amendment delivered to the site, spread at least two cubic yards (2 cy) of material onto a paved surface approximately two inches (2") deep. Pass a magnetic rake over the material in two directions. If any metal is found, test the entire load in the same manner. Perform all testing in the presence of the Project Inspector.
 5. Soil amendments, fertilizer, bark mulch and materials used for hydroseeding have been delivered to the site by the supplier, the invoices from the supplier indicate the project name and quantities delivered, and the Project Inspector has received copies of all such documents.
 6. Prior to planting, amendments and conditioners have been incorporated as per pre-planting recommendations, and planting areas have been made ready to receive planting.
- C. In case of failure to obtain any verification by the Project Inspector as required above, remove and replace work as necessary to obtain the verification at no additional cost to the Owner.

1.12 PROTECTION

- A. Provide protection for persons and property throughout progress of work. Use temporary barricades as required. Proceed with work in such manner as to minimize spread of dust and flying particles and to provide safe working conditions for personnel. Store materials and equipment where directed.
- B. Existing Construction: Execute work in an orderly and careful manner to protect paving, work of other trades, and other improvements.
- C. Existing Utilities: Provide protection for existing utilities within construction area. At no additional cost to Owner, repair any damages to utility lines that occur as a result of this work.
- D. Landscaping: Protect landscape work and materials from damage due to landscape operations, operations by other contractors and trades, and trespassers. Maintain protection during installation and maintenance periods.

**LANDSCAPING
SECTION 32 9000
3595001**

1.13 PLANTING SCHEDULE

- A. Install, establish, and maintain all lawn areas for a minimum of ninety (90) days prior to date of substantial completion. Coordinate schedule with other work and overall project schedule. Failure to install lawn areas by this date shall result in assessment of liquidated damages.
- B. Proceed with work in an orderly and timely manner to complete installation of landscaping within contract limits.

1.14 LANDSCAPE MAINTENANCE PERIOD REQUIREMENTS

- A. Beginning of Landscape Maintenance Period:
 - 1. General: Landscape Maintenance Period does not begin until all work is installed, as determined by Landscape Architect, in writing.
 - 2. On-site Inspection: When all work is complete, request and hold a meeting to include the Landscape Architect, Project Inspector, Architect and Owner's Representative who must together authorize and determine the start date for the landscape maintenance period. Coordinate and give notice of the date and time of the on-site meeting to all parties at least forty-eight (48) hours in advance.
 - 3. Acceptability: In cases where the lawn has reached adequate fullness and germination in some areas but not all, and authorization has not been given to begin the maintenance period, proceed with mowing, trimming, spraying, etc., as necessary prior to the beginning of the maintenance period.
- B. Duration of Landscape Maintenance Period:
 - 1. The Landscape Maintenance Period shall continue for a minimum of ninety (90) calendar days. During this time, continuously maintain all areas involved until final acceptance of the work by the Owner's Representative. See Landscape Maintenance Period procedure in Article LANDSCAPE MAINTENANCE, in Part 3 of this Section.

1.15 GUARANTEE

- A. The guarantee period for lawn and plant material shall be the duration of the landscape maintenance period, from commencement until final acceptance of the work of this Section.
- B. During the guarantee period, repair and/or replace plants and lawn not in satisfactory growing condition, as determined by Owner's Representative, without additional cost to Owner. Plants are to be replaced in accordance with Article LANDSCAPE MAINTENANCE in Part 3 of this Section, using plants of the same kind and size specified in plant list.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Use material in new and perfect condition as specified. Any deviations or substitutions from the Specification and Drawings must first be approved by Owner's Representative in writing prior to use.

2.2 SOIL PREPARATION MATERIALS

- A. Topsoil: Fertile; friable; natural loam surface soil; reasonably free of subsoil, clay lumps, brush, weeds and other litter; and free of roots, stumps, stones/rocks, and other extraneous or toxic matter harmful to plant growth.
- B. Soil Amendment: One-percent nitrogen-impregnated bark product with a ninety-percent (90%) bark base and zero to one-quarter inch (0-1/4") particle size, or approved equivalent. Do not spread until testing requirements have been satisfied.
- C. Fertilizer/Soil Conditioner: Gro-Power Plus or approved equal.
- D. Fertilizer for Trees: Seven-gram Gro-Power Planting Tablets (12-8-8 NPK) or approved equal.
- E. Vitamin B-1: "Superthrive", "Liquinox Start", "Cal-Liquid", or approved equal.

2.3 MISCELLANEOUS LANDSCAPE MATERIALS

- A. Bark Mulch: Untreated, shredded cedar.
- B. Tree-staking System: As indicated on Drawings.
- C. Pre-Emergent Weed Control: Oxadiazon, "Treeflan", "Ronstar 2G", "Surflan" (Elano Products Company), or approved equal.

2.4 PLANT MATERIAL:

- A. Nursery Plant Stock:
 - 1. As indicated on Drawings. Do not remove container-grown stock from containers until planting time. Plants shall be true to name.
 - 2. Healthy, shapely, well-rooted, not pot-bound, free from insect pests or plant diseases and properly "hardened off" before planting. Replace plants that are not alive or are not in satisfactory growing condition, as determined by the Landscape Architect, without additional cost to Owner. The Landscape Architect may reject plants before and/or after planting.

PART 3 - EXECUTION

3.1 SITE CONDITIONS

- A. Examine the site, verify grade elevations, and observe conditions under which work is to be performed. Do not proceed with work until unsatisfactory conditions have been corrected in a manner acceptable to the Owner's Representative.
- B. Proceed with complete landscape work as rapidly as portions of the site become available, working within seasonal limitations for each kind of landscape work required.
- C. Determine location of underground utilities and perform work in a manner which will avoid possible damage. Hand-excavate, as required, to minimize possibility of damage to underground utilities. Maintain grade stakes set by others until removal is mutually agreed upon by parties concerned.
- D. When conditions detrimental to sod or plant growth are encountered, such as rubble fill, adverse drainage condition, or other obstructions, notify the Owner's Representative before planting.

3.2 SOIL TESTING

- A. Coordinate soil testing in an expeditious and timely manner as required for on-site topsoil materials. Contract with a soil laboratory and include cost of sampling and testing in contract price. Take one (1) sample for every 5,000 square feet of landscape area up to a maximum of six (6) samples under the direction of and in the presence of the Owner's Representative.
- B. Submit each sample, according to the quantity of soil required by testing laboratory, to a competent laboratory approved by the Owner's Representative.
- C. Provide analysis of soil samples for pH, salinity, ammonia, phosphate, potassium, calcium, magnesium, boron, and sodium levels. Provide appraisal of chemical properties, including particle size determination, and recommendations for types and quantities of amendments and fertilizers.

3.3 PREPARATION

- A. Clearing of Vegetation:
 - 1. If live perennial weeds exist on site at the beginning of work, spray with a non-selective systemic contact herbicide as recommended and applied by an approved licensed landscape pest control advisor and applicator. Leave sprayed plants intact for at least 15 days.
 - 2. Clear and remove existing weeds by mowing or grubbing off all plant parts at least one-quarter inch ($\frac{1}{4}$ ") inch below surface of soil over entire areas to be planted.

B. Soil preparation:

1. Loosen soil in all planting areas, and on slopes flatter than 3:1 gradient, to a depth of six to eight inches (6" - 8") below finish grade. All debris, foreign matter, and stones shall be removed prior to the placing of any fertilizers or conditioners. Soil preparation is for all shrub planting beds, lawn hydroseeded areas and sodded lawn areas.
2. Conduct the required soil tests and instruct the lab to include a minimum of the following soil improvements in the recommendation on the soils report.
 - a. Soil Amendment: Two cubic yards (2 cy) per 1,000 square feet.
 - b. Gro-Power Plus: One hundred fifty pounds (150 lbs) per 1,000 square feet.
 - c. If the lab recommends less than six cubic yards (6 cy) of soil amendment, the excess bid amount shall be applied to the cost of any additional recommended soil improvements, or returned to the Owner as a credit
3. Apply amendments as follows, using rates recommended by the soils testing laboratory (the rates of amendments shown below are for bidding purposes only):
 - a. Fertilizer/Soil Conditioner: Broadcast 150 pounds of Gro Power Plus per 1,000 square feet in all planting areas and rototill to a depth of six to eight inches (6" - 8"). Remove from the site any rock and debris brought to the surface by cultivations. "Cultipack" all areas to receive sod or hydroseed.
 - b. Apply soil amendment to all planting areas at the rate of six cubic yards (6 cy) per 1,000 sf and rototill into the top six to eight inches (6" - 8").
4. Upon completion of finish grading, request an review and obtain approval of Landscape Architect prior to commencement of planting or hydroseeding.

C. Finish Grading for all Planting areas

1. Refer to Earthwork Specification Section for Rough Grading.
2. Grade to elevations and contours shown on Drawings. Fill low spots with landscape backfill material and grade to surface drain in manner indicated on Drawings.
3. Finish-grade so that the entire area within the contract lines has a natural and pleasing appearance as specified and as directed by Landscape Architect.
4. Adjust sprinkler heads flush to finish grade in preparation to receive hydroseeding or one-half inch above finish grade in preparation to receive sod. Reset sprinkler heads flush to grade after turf has germinated.
5. Flag the sprinkler heads and valve markers.

D. Planting Pits for Trees:

1. Excavate pits with vertical sides and with bottom of excavation slightly raised at center to provide proper drainage.

LANDSCAPING
SECTION 32 9000
3595001

2. Set container-grown stock in center of pit on earth pedestal. Separate roots and/or prune roots as directed by Landscape Architect. In hot weather, pre-wet pit. Loosen outside roots from sides and bottom of root ball. When set, place additional backfill around base and sides of root ball. Work each layer to settle backfill and eliminate voids and air pockets. Water after placing final layer of backfill.
3. Loosen hard subsoil in bottom of excavation. Extend excavation as required to insure proper drainage from plant pits.
4. Fill excavated planting pits with water to half the depth of pit. Pits should drain within four hours (4 hrs). If planting pits do not drain, notify Project Inspector immediately. Do not proceed with planting until Landscape Architect has resolved a method to provide drainage.

3.4 PLANTING

A. Trees:

1. Lay out individual trees locations and areas for multiple plantings. Stake the locations, outline the areas, and secure the Owner's Representative's acceptance before beginning the planting work. Make minor adjustments as requested.
2. Scarify root ball prior to planting. Plant in holes twice the diameter of the root ball and to a depth equal to the container's height. Place the shrub and/or groundcover so the top of the root ball is one inch (1") higher than the surrounding grade. Set container-grown stock in center of pit. In hot weather, pre-wet the pit. When set, place additional backfill around base and sides of root ball. Work each layer to settle backfill and eliminate voids and air pockets. Thoroughly compact lower half of backfill in plant pit. See staking or guying detail. Water after planting. Provide a berm or watering basin for each tree. Add Vitamin B-1, in the proper solution as recommended by the manufacturer, to the second watering of the basin.
3. Place fertilizer planting tablets in root zone and alongside each plant. Follow manufacturer's instructions for number of tablets to use for each container size.
4. See Drawings for additional information.
5. Grooming and Staking of Trees:
 - a. Prune, thin-out and shape trees in accordance with standard horticultural practice. Prune trees to retain required height and spread. Unless otherwise directed by Landscape Architect, do not cut tree leaders, and remove only injured or dead branches from flowering trees.
 - b. Paint cuts over one-half inch ($\frac{1}{2}$ ") in size with standard tree paint or compound, covering exposed, living tissue. Use paint that is waterproof, antiseptic, adhesive, elastic and free of kerosene, coal tar, creosote, and other substances harmful to plants. Do not use shellac.
 - c. Stake or guy trees immediately after planting, as indicated on Drawings.

- B. Request review by the Landscape Architect after locating, but prior to planting all trees. Under the direction of the Landscape Architect, make slight adjustments to plant material location as necessary to reflect original intention of Drawings.

3.5 WEED CONTROL

- A. Apply pre-emergent weed control to all planting areas (except lawn) after completion of all planting and one complete watering. Follow manufacturer's directions. To prevent washing away of weed control, do not over-water after its application. Do not allow any weed control into lawn areas. Treat any existing noxious weeds, such as Johnson grass, with Roundup in successive treatments until all roots are destroyed, then remove all grass and roots. Notify Owner's Representative of time of installation for verification of application.

3.6 BARK MULCH

- A. Apply mulch at the rate of three inches (3") deep to all planting areas, exclusive of lawn, after the planting and weed control are completed. Twelve inches (12") from planter edges, taper full depth of mulch to meet adjacent grades. Do not place mulch within three inches (3") of trunk or stems.

3.7 CLEAN-UP

- A. During construction, keep the site free of rubbish and debris, and clean up the site promptly when notified to do so. Take care to prevent spillage on streets from hauling and immediately clean up any such spillage and/or debris deposited on streets due to the work of this Section.
- B. During all phases of the construction work, take all precautions to abate dust nuisance by clean-up, sweeping, sprinkling with water, or other means as necessary.
- C. Paving: Maintain cleanliness of paving areas and other public areas used by equipment, and immediately remove spillage; remove rubbish, debris, and other material resulting from landscaping work, leaving site in a safe and clean condition.

3.8 LANDSCAPE MAINTENANCE

- A. The Landscape Maintenance Period will begin when all the Landscape Maintenance Period Requirements have been met (See Part 1 of these Specifications).
- B. Cleaning: Maintain cleanliness on paving areas and other public areas used by equipment and immediately remove all spillage. Remove from project site all rubbish and debris found thereon and all material and debris resulting from landscaping work, leaving the site in a safe and clean condition.

**LANDSCAPING
SECTION 32 9000
3595001**

C. Maintenance:

1. Sprinkler Irrigation System:

- a. Check system weekly for proper operation. Flush lateral lines out after removing last sprinkler head or two at each end of lateral. Adjust all heads as necessary for unimpeded coverage.
- b. Set and program automatic controllers for seasonal water requirements. Provide the Owner's Representative with keys to the controllers and instructions on how to turn off system in case of emergency.
- c. Repair all damages to sprinkler irrigation system as part of the contract work. Make repairs within one watering period or one week, whichever is the least amount of time.

2. Trees:

- a. Water enough that moisture penetrates throughout root zone and only as frequently as necessary to maintain healthy growth.
- b. Construct and/or remove water basins around each plant, depending on the time of the year and as directed.
- c. Do not prune unless directed by the Landscape Architect.
- d. Replace any dead, dying or vandalized plant material on a weekly basis throughout the Landscape Maintenance Period.

3. Insecticide and Herbicide Application:

- a. If needed, control weeds with selective herbicides and sprays. In areas where crabgrass has infested the lawn, apply pre-emergent herbicides such as Dacthal by Amvac, Balan, or Betasan by Gowan for control prior to crabgrass germination. Control insect pests if necessary.
- b. Use only a licensed Pest Control Operator to apply herbicides and sprays and to maintain a log for applications indicating material, timing, and rate.

D. Final Acceptance of the Landscape Maintenance Period: request on-site meeting forty-eight hours (48 hrs.) in advance with the Landscape Architect and Owner's Representative to determine the end of the Landscape Maintenance Period.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Domestic water piping system.
 - 2. Fire protection piping systems.
 - 3. Sewer piping system

1.2 RELATED REQUIREMENTS

- A. Section 01 5000, Temporary Facilities and Controls.
- B. Section 01 6116, Volatile Organic Compound (VOC) Restrictions, for VOC limits pertaining to adhesives, sealants, fillers, primers, and coatings.
- C. Section 01 8113, Sustainable Design Requirements, for CAL-Green [and Collaborative for High Performance Schools (CHPS)] general requirements and procedures.
- D. Section 31 0000, Earthwork.
- E. Section 31 2333, Trenching and Backfilling.
- F. Section 32 1600, Site Concrete.

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CAL Green), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- C. California Plumbing Code, (CPC), edition as noted on the Drawings.
- D. California State Health and Safety Code Section 116875, Lead Free Public Water Systems.
- E. Local Jurisdiction: Any work within the street, highway or right-of-way shall be performed in accordance with the requirement of the governmental agencies having jurisdiction, and shall not begin until all of those governing authorities have been notified.
- F. ASTM International (ASTM):
 - 1. D422-63: Test Method for Particle Size Analysis of Soil.
 - 2. D698-00: Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures, Using 5.5 lb (2.49 Kg) Rammer and 12 inch (304.8 mm) Drop.

3. D1556-00: Test Method for Density of Soil in Place by the Sand-Cone Method.
4. D1557-02: Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 10 lb. (4.54 Kg) Rammer and 18 inch (457 mm) Drop.
5. D3017-05: Test Methods for Moisture Content of Soils and Soil-Aggregate Mixture by Nuclear Methods (Shallow Depth).
6. D4318-05: Test Method for Liquid Limit, Plastic Limit, and Plasticity Limit.

G. CALTRANS Standard Specifications.

H. CAL-OSHA, Title 8, Section 1590 (e).

I. NFPA 13, 24 and 25, per CFC chapter 80 and CBC chapter 35.

1.4 ADMINISTRATIVE REQUIREMENTS

A. Submittal Procedures:

1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
3. Sustainable Design Submittals shall comply with the additional requirements of Section 01 8113, Sustainable Design Requirements.

1.5 ACTION SUBMITTALS

- A. Provide supplier's descriptive literature for all products to demonstrate compliance with specified attributes.
- B. Substitution: Provide all data of proposed material being submitted as a substitution. Provide comparison with specified product data and identify all differences. Failure to provide comparison will be reason for rejection.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For contractor / installer.
- B. Provide sieve analysis from accredited testing lab on pipe bedding material. Analysis shall have a current date not older than project contract signing date.
- C. Sustainable Design:
1. General:
 - a. Submit information necessary to establish and document compliance with the California Green Building Standards Code.
 - b. Sustainable design submittals are in addition to other submittals.
 2. The following information shall be provided:
 - a. Adhesives and Sealants: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.

- b. Paints and Coatings: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.

1.7 CLOSEOUT SUBMITTALS

- A. Guarantee: Submit subcontractor's guarantee.
- B. Water Sterilization Test Report.

1.8 QUALITY ASSURANCE

- A. Contractor / Installer shall have been in business for five (5) years providing/finishing similar size projects and complexity.
- B. Contractor shall be solely responsible for all subgrades built. Any repairs resulting from inadequate compaction or incorrect grades will be the responsibility of the contractor.
- C. The representatives of the Owner's testing lab will not act as supervisor of construction, nor will they direct construction operations. Neither the presence of the Owner's testing lab representatives nor the testing by the Owner's testing lab shall excuse the contractors or subcontractors for defects or deficiencies discovered in their work during or following completion of the project. Correcting inadequate compaction is the sole responsibility of the contractor.
- D. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the drawings to be salvaged and re-used.
 - 1. Sun damaged or discolored PVC pipe will be rejected.
- E. All materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.

1.9 FEES, PERMITS, AND UTILITY SERVICES

- A. Obtain and pay for permits and service charges required for installation of Work. Arrange for required inspections and secure written approvals from authorities having jurisdiction.
- B. Upon completion of work within right-of-way, provide copies of written final approval to the Architect.

1.10 DELIVERY, STORAGE AND HANDLING

- A. Transport, store and handle in strict accord with the local jurisdiction and manufacturer's written recommendations
- B. Deliver undamaged products to job in manufacturer's sealed containers and/or original bundles with tags and labels intact.

1.11 EXISTING SITE CONDITIONS

- A. Contractor shall acquaint himself with all site conditions. If unknown active utilities are encountered during work, notify Architect promptly for instructions. Failure to notify will make Contractor liable for damage to these utilities arising from Contractor's operations subsequent to discovery of such unknown active utilities.
- B. Existing civil, mechanical and electrical improvements are shown on respective site plans to the extent known. Should the Contractor encounter any deviation between actual conditions and those shown, he is to immediately notify the Architect before continuing work.

1.12 PROTECTION

- A. Adequate protection measures shall be provided to protect workmen and passers-by on and off the site. Adjacent property shall be fully protected throughout the operations. Blasting will not be permitted. Prevent damage to adjoining improvements and properties both above and below grade. Restore such improvements to original condition should damage occur. Replace trees and shrubs outside building area disturbed by operations.
- B. In accordance with generally accepted construction practices, the Contractor shall be solely and completely responsible for working conditions at the job site, including safety of all persons and property during performance of the work. This requirement shall apply continuously and shall not be limited to normal working hours.
- C. Any construction review of the Contractor's performance conducted by the Geotechnical Engineer is not intended to include review of the adequacy of the Contractor's safety measures, in, on, or near the construction site.
- D. Provide shoring, sheeting, sheet piles and or bracing to prevent caving, erosion or gullyng of sides of excavation.
- E. Surface Drainage: Provide for surface drainage during period of construction in manner to avoid creating nuisance to adjacent areas. The contractor shall make a reasonable effort on a daily basis to provide pumps and all equipment necessary to keep all excavations and the site free from water during entire progress of work, regardless of cause, source, or nature of water.
- F. Adjacent streets and sidewalks shall be kept free of mud, dirt or similar nuisances resulting from earthwork operations.
- G. The site and adjacent influenced areas shall be watered as required to suppress dust nuisance. Dust control measures shall be in accordance with the local jurisdiction.
- H. Trees: Carefully protect existing trees that are to remain. Provide temporary irrigation as necessary to maintain health of trees.

1.13 SEASONAL LIMITS

- A. No fill material shall be placed, spread or rolled during unfavorable weather conditions. When work is interrupted by rains, fill operations shall not be resumed until field tests indicate that moisture content and density of fill are satisfactory.

1.14 RECORD DRAWINGS

- A. Keep a daily record of all pipe placed in ground, verified by Project Inspector.
- B. Upon completion of this Contract, furnish one tracing showing all outside utility lines, piping, etc., installed under this Contract. Locate and dimension all work with reference to permanent landmarks.
- C. All symbols and designations used in preparing "RECORD" drawings shall match those used in Contract drawings.
- D. Properly identify on as-builts and provide dimensions for all stubs for future connections. Provide concrete markers 6" dia. 12" deep, flush with finish grade at the ends of all stubbed pipes.
- E. Provide record drawings per Section 01 3300.

PART 2 - PRODUCTS

2.1 DESIGN AND PERFORMANCE CRITERIA

- A. Sustainable Design:
 - 1. VOC emissions for field-applied adhesives, sealants, and sealant primers must comply with limits specified in Section 01 6116.
 - 2. VOC emissions for field-applied paints and coatings must comply with limits specified in Section 01 6116.

2.2 MATERIALS - GENERAL

- A. Provide each item listed herein or shown on drawings of quality noted or approved equal. All material shall be new, full weight, standard in all respects and in first-class condition. Insofar as possible, all materials used shall be of same brand or manufacture throughout for each class of material or equipment. Materials shall be of domestic manufacture and shall be tested within Continental United States.
- B. Grade or quality of materials desired is indicated by trade names or catalog numbers stated herein.
- C. Dimensions, sizes, and capacities shown are minimum and shall not be changed without permission of Architect.
- D. All materials in this section used for any public water system or domestic water for human consumption shall be lead free.

1. For the purposes of this section, "lead free" means not more than 0.2 percent lead when used with respect to solder and flux and not more than 8 percent when used with respect to pipes and pipe fittings.
2. All pipe, pipe or plumbing fitting or fixtures, solder, or flux shall be certified by an independent American National Standards Institute (ANSI) accredited third party, including, but not limited to, NSF International, as being in compliance with this section.

E. All materials used for fire system piping shall be UL and FM approved.

2.3 VALVE BOXES

- A. Provide at each valve or cock in ground a Christy, Brooks, or equal to Christy G05CT, concrete valve box with cover marked for service, domestic water shall be marked "Water" and fire supply shall be marked "Fire". Furnish extension handles for each size square nut valve, and provide "fork" handle for each size of "wheel handle" valve as required. Do not locate valve boxes in walk, or covered passages, curbs, or curb & gutters, unless necessary. If valve location is within concrete or asphalt paved surface valve box shall be as detailed on plans for such condition. Provide valve box extensions as required to set bottom of valve box to bottom of piping in which valve is installed. Provide Owner with set of special wrenches and/or tools as required for operation of valves.

2.4 PIPES AND FITTINGS

- A. Sanitary Sewer: PVC sewer pipe and fittings with Ring-Tite joints, ASTM D3034 SDR35.
- B. Domestic water Lines 3 1/2" and smaller: Type K copper tubing, hard temper, with wrought copper fittings. Schedule 80 PVC, ASTM D 1784, ASTM D 1785.
- C. Water lines 4" and larger: AWWA C-900 Class 150/DR18 with rubber gasket joints.
- D. Fire lines 4" and larger: AWWA C-900 Class 200/DR14 with rubber gasket joints.
- E. Solder: Lead Free. 95/5; 95% Tin / 5% Antimony.
- F. Ductile Iron Pipe; AWWA Class 51, Cement Lined
- G. Ductile Iron Pipe Fittings; AWWA C110, C153, Ebba Iron, Star Romac, Sigma, or approved equal.
- H. PVC Mechanical Fittings; Ebba Iron, Star; Romac; Sigma or approved equal.
- I. Ductile Iron Pipe/PVC C-900 Pipe Restrained Fittings; Ebba Iron # 3800 Mega Coupling, Ebba Iron 1100CH Split Restrained Harness for pipe couplings. StarGrip Series 4000.
- J. Ductile Iron Pipe/PVC C900, C905 Restrained Degreedand Blind Cap Fittings,;
- K. Mega Lug; Sigma; Romac; or an approved equal

- L. Mechanical Fitting Bolts; Bolts and nuts shall be carbon steel with a minimum 60,000 psi tensile strength conforming to ASTM A 307, Grade A. Bolts shall be standard ANSI B1.1 Class 2A course threads. Nuts shall conform to ASTM A 563 and be standard ANSI B1.1, Class 2A course thread. All bolts and nuts shall be zinc coated.
- M. Fasteners Anti-Rust Coatings; After assembly, coat all fasteners with an Asphaltic Bituminous coatings conforming to latest edition NFPA 24.
- N. Ductile Iron Pipe Wrap; 8 mil polyethylene pipe wrap conforming to ANSI/AWWA C105/A21.5 standards.
- O. Pipe Insulation; Pipe exposed to atmospheric conditions ½" thru 4" NPT; Johns Manville rigid fiberglass insulation, Micro Lok HP; Owens Corning Fiberglas SSL II; Conforming to ASTM C 612, Type 1A or type 1B.
- P. Aluminum field applied pipe insulation jacket; comply with ASTM B209, ASTM C1729, ASTM C1371 Manufacturers; Childers Metals; ITW Insulation Systems Aluminum Jacketing; or an approved equal.
 - 1. Finish shall be flat mill finish
 - 2. Factory Fabricated Fitting Covers; 45 and 90 degree elbows, tee's, valve covers, end caps, unions, shall be of the same thickness and finish of jacket.
 - 3. The fittings shall be composed of 2-pieces
 - 4. Adhesives; per the manufacturers requirements
 - 5. Joint Sealant; shall be silicone, and shall be aluminum in color.
- Q. Sewer Forced Main; HDPE, DR 11, color gray with green stripe by JM Eagle or approved equal.

2.5 SANITARY SEWER MANHOLES

- A. Shall be constructed as shown on plan details.

2.6 CLEANOUTS

- A. Cleanouts of same diameter as pipe up to 8" in size shall be installed in all horizontal soil and waste lines where indicated and at all points of change in direction. Cleanouts shall be located not less than 18" from building so as to provide sufficient space for rodding. No horizontal run over 100 feet shall be without cleanout whether shown on drawings or not.
- B. All cleanout boxes shall be traffic rated with labeled lid, Christy G05CT or approved equal. Lid shall be vandal proof with stainless steel screws

2.7 UNIONS

- A. Furnish and install one union at each threaded or soldered connection to equipment and 2 unions, one on each side of valves on pipes ½" to 3".

- B. Locate unions so that piping can be easily disconnected for removal of equipment or valve. Provide type specified in following schedule:

Type of Pipe Union

Steel Pipe: 150 lb. Screwed malleable ground joint, brass, brass-to-iron seat, black or galvanized to match pipe.

Copper tubing: Brass ground joint with sweat connections.

PVC Sch 80 pipe: PVC union, FIPT X FIPT

2.8 VALVES

- A. Provide valves as shown and other valves necessary to segregate branches or units. Furnish valves suitable for service intended. Valves shall be properly packed and lubricated. Valves shall be non-rising stem. Place unions adjacent to each threaded or sweat fitting valve. Install valves with bonnets vertical. All valves shall be lead free.
- B. Valves ½" thru 2"; shall be made of bronze, full size of pipe and lead free. Nibco S-113-FL Series; American G-300 Series; Matco 511 FL Series; Apollo 102T-FL Series. Brass valves of brass parts within valves will not be accepted.
- C. Valves, 2 ½" thru 3" shall be class 150; Shall be made of bronze, full size of pipe; Jenkins Fig. 2310 J; Lunkinheimer Fig. 2153; Crane Fig. 437; Stockham Fig. B-128.
- D. Valves, Flanged; 4" thru 12" Ductile Iron Resilient Wedge Gate Valve; Nibco F 609 RW; American 2500 Series; Kennedy 8561; Mueller 2360 Series.

2.9 TAPPING SLEEVE

- A. Shall be used on pipe sizes 6" thru 12" and shall be made with stainless steel material including stainless steel bolts. Flanges shall be ductile iron or high carbon steel. Gaskets shall seal full circumference of pipe. Shall be manufactured for operating pressure of 200 psi, and shall pass test pressure of 300 psi. Romac SST series; Smithblair 662; Mueller H304; Ford "FAST" tapping sleeve.

2.10 SERVICE SADDLES

- A. Shall be used on pipe size 2" thru 4". Body shall be made from ductile iron with epoxy coating or bronze. Cascade Style CSC-1; A.Y. McDonald model 3891 AWWA/3892 FNPT; Smith-Blair #317; Ford S70, S71, S90, (style B).

2.11 TRACER WIRE

- A. No. 10 THW solid copper wire. Solder all joints

PART 3 - EXECUTION

3.1 DRAWINGS AND COORDINATION

- A. General arrangement and location of piping, etc., are shown on Drawings or herein specified. Install work in accord therewith, except for minor changes that may be necessary on account of other work or existing conditions. Before excavation, carefully examine other work that may conflict with this work. Install this work in harmony with other craft and at proper time to avoid delay of work.
- B. Verify invert elevations at points of connection to existing systems prior to any excavation. If invert elevations differ from that shown on drawings, notify Architect immediately.
- C. In advance of construction, work out minor changes if conflicts occur with electrical or mechanical. Relocate services to suit actual conditions and work of other trades to avoid conflict therewith. Any adjustments or additional fittings to make adjustments shall not be cause for additional costs to the owner.
- D. Execute any work or apparatus shown on drawings and not mentioned in specifications, or vice versa. Omission from Drawings or Specifications of any minor details of construction, installation, materials, or essential specialties does not relieve Contractor of furnishing same in place complete.
- E. Graded pipes shall take precedence. If conflict should occur while placing the domestic water and fire service piping, the contractor shall provide any and all fittings necessary to route the water lines over such conflicting pipes at no additional costs to the owner.

3.2 ACCESS

- A. Continuously check for clearance and accessibility of equipment or materials specified herein to be placed. No allowance of any kind shall be made for negligence on part of Contractor to foresee means of installing his equipment or materials into proper position.

3.3 EXCAVATING AND BACKFILLING

- A. Excavation and Bedding:
 - 1. General: Trench straight and true to line and grade with bottom smooth and free of irregularities or rock points. Trench width to be a minimum of 12" wider than outside diameter of pipe. Follow manufacturer's recommendations for use of each kind and type of pipe.
 - 2. Bedding: Provide a bedding as noted on drawing details for the full length of the pipe. Bedding shall have a minimum thickness beneath the pipe of 4" or 1/8 the outside diameter of the pipe, which ever is greater. Provide bell holes and depressions for pipe joints only of size required to properly make joint.
 - 3. If the trenches for the site utilities falls within areas to be lime treated, the piping shall be installed prior to any lime treatment operations, providing the elevation of the piping is below the treatment section.

UTILITIES
SECTION 33 0000
3595001

- a. If trenching is necessary in areas that have been previously lime treated the contractor shall backfill the trench with class 2 aggregate base, with minimum section equal to the lime treated section and compacted to 95%.

B. Laying of Pipe:

1. General: Inspect pipe prior to placing. Sun damaged pipe will be rejected. Set aside any defective or damaged material. Do not place pipe in water nor place pipe when trenches or weather are unsuitable. Lay pipe bell up grade, true to line and grade.
 - a. Sewer pipe shall be laid in strict conformity to the prescribed line and grade, with grade bars set and each pipe length checked to the grade line. Three consecutive points on the same rate of slope shall be used at all times to detect any variation from a straight grade. In any case of discrepancy, work shall be stopped and the discrepancy immediately reported to the Owner's Representatives. In addition, when requested by the Owner's Representative, a string line shall be used in the bottom of the trench to insure a straight alignment of the sewer pipe between manholes. The maximum deviation from grade shall not be in excess of 1/4 inch. In returning the pipe to grade, no more than 1/4" depression shall result.
 - b. The Contractor shall expose the end of existing pipe to be extended, for verification of alignment and elevation, prior to trenching for any pipe which may be affected. All costs of such excavation and backfill shall be included in the price paid for the various items of work.
 - c. A temporary plug, mechanical type shall be installed on sewer pipe at the point of connection to existing facilities. If connecting to a public facility the plug shall conform to the requirements of the local jurisdiction. This plug shall remain in place until the completion of the balling and flushing operation.
2. Bell and Spigot Joints: Lubricate inside of bells and outside of spigots with soap solution. Wedge joints tight. Bell of bell and spigot pipe to be pointed up grade.

C. Backfilling:

1. General: Do not start backfill operations until required testing has been accomplished.
2. Compaction and Grading: Remainder of backfill shall be in accordance with Section 31 2333 – TRENCHING AND BACKFILLING.
3. If trenching in area previously lime or cement treated backfill top of trench section, same depth as lime or cement treatment with Class 2 Aggregate Base compacted to 95% minimum relative compaction.

3.4 INSTALLATION OF WATER PIPING

- A. Immediately cap or plug ends of, and opening in, pipe and fittings to exclude dirt until final connections made. Use reducing fittings where any change in pipe size occurs. Bushings shall not be used.

- B. General: Should existing conditions or other work prevent the running of pipes or the setting of equipment at the points indicated by drawings, changes as authorized by the Architect shall be made without additional cost to the Owner.
- C. All bolts used on mechanical fittings shall be thoroughly coated with an asphaltic bituminous coating conforming to 2007 NFPA (National Fire Protection Association) 10.3.5.2 and 10.8.3.5, CBC chapter 35 and CFC chapter 80.
- D. All buried metal shall be incased with 8 mil polyethylene wrap so that no soil is in contact with metal. Ends of polyethylene wrap shall be taped to provide seal with pipe.
- E. Do not install water lines in same trench with non-metallic sewer lines unless bottom of water pipe at all points is at least 12" above top of sewer line and water line is placed on solid shelf excavated at one side of common trench with a minimum of 12 inch horizontal separation.
- F. Under no circumstance shall a fitting be located directly under a structural footing without prior approval from the Architect.
- G. In locations where existing domestic pipe is rerouted, the new pipe shall be assembled using restrained fittings at all joints including factory pipe joints. Tapped restrained blind flanges shall be temporarily installed at each end of the assembled pipes until testing and chlorination is completed and approved.

3.5 CLOSING IN OF UNINSPECTED WORK

- A. Do not allow or cause work installed to be covered up or enclosed before it has been inspected, tested, and approved. Should work be enclosed or covered up before it has been approved, uncover work at own expense. After it has been inspected, tested and approved, make repairs necessary to restore work of other contractors to condition in which it was found at time of cutting.

3.6 CARE AND CLEANING

- A. Repair or replace broken, damaged, or otherwise defective parts, materials, and work. Leave entire work in new condition satisfactory to Architect. At completion, carefully clean and adjust equipment, fixtures and trim that are installed as part of this work. Leave systems and equipment in satisfactory new operating condition.
- B. Drain and flush piping to remove grease and foreign matter.
- C. Sewer piping shall be balled and flushed.
- D. Clean out and remove surplus materials and debris resulting from the work, including surplus excavated material.
- E. Flush fire service piping in the presence of the project inspector. Flushing shall be continued for a sufficient time as necessary to ensure all foreign material has been removed. Flow rate shall be equal to site fire flow requirements.

3.7 SEWER INTERNAL INSPECTIONS

- A. Upon completion of construction and prior to final inspection, the Contractor shall clean the entire new pipeline of all dirt and debris. Any dirt or debris in previously existing pipes or ditches in the area, which resulted from the new installation, shall also be removed. Pipes shall be cleaned by the controlled balling and flushing method. Temporary plugs shall be installed and maintained during cleaning operations at points of connection to existing facilities to prevent water, dirt, and debris from entering the existing facility.

3.8 TEST OF PIPING

- A. Pressure Test piping at completion of roughing-in, in accord with following schedule, and show no loss in pressure or visible leaks after minimum duration or four (4) hours at test pressures indicated.
- B. Chlorination tests shall be performed after all fixtures and any required mechanical devices are installed and the entire system is complete and closed up.
- C. In cases where new domestic water piping is assembled for re-routing of existing domestic water pipe, the contractor shall perform the following testing prior to connecting the new water pipe to the existing system.
 - 1. The pipe shall be pressure tested and per the test schedule.
 - 2. The pipe shall be pressure tested down within the trench.
 - 3. The contractor shall dig a temporary ditch below the existing pipe to drain to a sump that is lower than the bottom of the trench and to the side of the trench. The sump shall be 30% larger than the total volume of water within the testing pipe assembly.
 - 4. After pressure testing and chlorination has taken place and accepted, the contractor shall drain the pipe into the sump and pump the sump out as it is filling.
 - 5. The temporary test fittings at each end of the pipe assembly shall be removed and the final restrained couplings installed.
 - 6. The existing piping shall be cut and the water within the pipe shall drain below the pipe to the temporary sump. Pump the sump as it is being filled up. Take extreme caution not to contaminate the existing pipe with any contaminants within the trench.
 - 7. Before making the final coupling connections, the restrained couplings at each end of the new pipe shall be thoroughly swabbed inside the fitting with a solution of chlorine mixed with water at a rate of 1 part chlorine to 4 parts potable water.
 - 8. After final connections are made, a visual inspection shall be made after fittings are wiped off. If after 1 hr, no noticeable drips are noted the pipe can be backfilled.
 - 9. The contractor shall flush all water piping affected by chlorination until it is within acceptable levels approved by certified testing lab.

TEST SCHEDULE

<u>System Tested</u>	<u>Test Pressure PSIG Test With</u>
Public Water Mains	Per local jurisdiction requirements.
Private Domestic Water Piping:	150 Lbs. Water 4 hrs.
Fire Protection Piping:	200 Lbs. Water pressure, 4 hrs duration with no pressure loss.
Sanitary Sewer Piping:	Sewer system shall be tested for leakage per local jurisdiction requirements.

- D. Testing equipment, materials, and labor shall be furnished by contractor.

3.9 WATER SYSTEM STERILIZATION

- A. Public Water Mains: Shall be flushed and disinfected per the local jurisdiction requirements
- B. Clean and disinfect all site water systems connected to the domestic water systems in accordance with AWWA Standard C651 and as required by the local Building and Health Department Codes, and EPA.
 - 1. Clean and disinfect industrial water system in addition to the domestic water system.
 - 2. Disinfect existing piping systems as required to provide continuous disinfection upstream to existing valves. At Contractors option, valves may be provided to isolate the existing piping system from the new piping system.
- C. Domestic water sterilization shall be performed by a licensed "qualified applicator" as required by CAL-EPA Pesticide Enforcement Branch for disinfecting and sterilizing drinking water.
- D. Disinfecting Agent: Chlorine product that is a registered product with Cal-EPA for use in California potable water lines, such as Bacticide, CAL-EPA Registration No. 37982-20001.
- E. Contractor to provide a 1" service valve connected to the system at a point within 2'-0" of its junction with the water supply line. After sterilization is complete Contractor to provide cap at valve.
- F. Sterilization Procedure to be as follows:
 - 1. Flush pipe system by opening all outlets and letting water flow through the system until clear water flows from all outlets.

UTILITIES
SECTION 33 0000
3595001

2. Inject disinfecting agent to provide a minimum chlorine residual concentration of at least 50 parts per million (ppm) of free chlorine at each outlet.
 3. Provide sign at all outlets which reads "Water Sterilization in Progress – Do not operate". Remove signs at conclusion of test.
 4. Close all outlets and valves, including valve connecting to water supply line and 1" service valve. Retain treated water in pipe for a minimum of twenty-four hours. Should chlorine residual at pipe extremities be less than 50 PPM at this time, pipe shall be re-chlorinated. As an option, the water systems may be filled with a water-chlorine solution containing a minimum of 200 PPM of chlorine and allowed to stand for three hours.
 5. After chlorination, flush lines of chlorinated water and refill from domestic supply. Continue flushing until residual chlorine is less than or equal to 0.2 ppm, or a residual the same as that of the test water.
- G. Chemical and bacteriological tests shall be conducted by a state-certified laboratory and approved by the local authorities having jurisdiction.
- H. Submit written report to Health Department as required by State Regulations. Provide a copy of report to Architect prior to completion of project.
- I. The costs of sterilization and laboratory testing shall be paid for by the contractor.

3.10 CLEANING

- A. Upon completion of work of this Section promptly remove from the working area all scraps, debris and surplus material of this Section.

END OF SECTION

s:\master specifications\division 33 - utilities\33 0000_utilities.docx
Formatting Updated: 9-13-21

PART 1 - GENERAL

1.1 SUMMARY

- A. Summary Includes:
 - 1. Storm drainage piping systems.

1.2 RELATED REQUIREMENTS

- A. Section 01 5000, Construction Facilities and Controls.
- B. Section 01 6116, Volatile Organic Compound (VOC) Restrictions, for VOC limits pertaining to adhesives, sealants, fillers, primers, and coatings.
- C. Section 01 8113, Sustainable Design Requirements, for CAL-Green **[and Collaborative for High Performance Schools (CHPS)]** general requirements and procedures.
- D. Section 31 0000, Earthwork.
- E. Section 31 2333, Trenching and Backfilling.
- F. Section 32 1200, Asphalt Concrete Paving.
- G. Section 32 1600, Site Concrete

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CAL Green), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- C. California Plumbing Code, (CPC), edition as noted on the Drawings.
- D. Local Jurisdiction: Any work within the street, highway or right-of-way shall be performed in accordance with the requirement of the governmental agencies having jurisdiction, and shall not begin until all of those governing authorities have been notified.
- E. ASTM International (ASTM):
 - 1. D 422-63 Test Method for Particle Size Analysis of Soil.
 - 2. D698-00 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures, Using 5.5 lb (2.49 Kg) Rammer and 12 inch (304.8 mm) Drop.
 - 3. D1556-00 - Test Method for Density of Soil in Place by the Sand-Cone Method.
 - 4. D1557-02 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 10 lb. (4.54 Kg) Rammer and 18 inch (457 mm) Drop.

STORM DRAINAGE UTILITIES
SECTION 33 4000
3595001

5. D 3017-05 Test Methods for Moisture Content of Soils and Soil-Aggregate Mixture by Nuclear Methods (Shallow Depth).
6. D 4318-05 Test Method for Liquid Limit, Plastic Limit, and Plasticity Limit.

F. CALTRANS Standard Specifications.

G. CAL-OSHA, Title 8, Section 1590 (e).

1.4 ADMINISTRATIVE REQUIREMENTS

A. Submittal Procedures:

1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
3. Sustainable Design Submittals shall comply with the additional requirements of Section 01 8113, Sustainable Design Requirements.

1.5 ACTION SUBMITTALS

- A. Provide supplier's descriptive literature for all products to demonstrate compliance with specified attributes.
- B. Substitution: Provide all data of proposed material being submitted as a substitution. Provide comparison with specified product data and identify all differences. Failure to provide comparison will be reason for rejection.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: Contractor / installer.
- B. Provide sieve analysis from accredited testing lab on pipe bedding material. Analysis shall have a current date not older than project contract signing date.
- C. Sustainable Design:
1. General:
 - a. Submit information necessary to establish and document compliance with the California Green Building Standards Code.
 - b. Sustainable design submittals are in addition to other submittals.
 2. The following information shall be provided:
 - a. Adhesives and Sealants: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.
 - b. Paints and Coatings: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.

1.7 CLOSEOUT SUBMITTALS

- A. Guarantee: Submit subcontractor's guarantee.

1.8 QUALITY ASSURANCE

- A. Contractor / Installer shall have been in business for five (5) years providing/finishing similar size projects and complexity.
- B. Contractor shall be solely responsible for all subgrades built. Any repairs resulting from inadequate compaction are the responsibility of the contractor.
- C. The representatives of the Owner's testing lab will not act as supervisor of construction, nor will they direct construction operations. Neither the presence of the Owner's testing lab representatives nor the testing by the Owner's testing lab shall excuse the contractors or subcontractors for defects discovered in their work during or following completion of the project. Correcting inadequate compaction is the sole responsibility of the contractor.
- D. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.
 - 1. Sun damaged or discolored PVC pipe will be rejected.
- E. All materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.

1.9 DELIVERY, STORAGE AND HANDLING

- A. Transport, store and handle in strict accord with the local jurisdiction and manufacturer's written recommendations
- B. Deliver undamaged products to job in manufacturer's sealed containers and/or original bundles with tags and labels intact.

1.10 EXISTING SITE CONDITIONS

- A. Contractor shall acquaint himself with all site conditions. If unknown active utilities are encountered during work, notify Architect promptly for instructions. Failure to notify will make Contractor liable for damage to these utilities arising from Contractor's operations subsequent to discovery of such unknown active utilities.
- B. Existing civil, mechanical and electrical improvements are shown on respective site plans to the extent known. Should the Contractor encounter any deviation between actual conditions and those shown, he is to immediately notify the Architect before continuing work.

1.11 PROTECTION

- A. Adequate protection measures shall be provided to protect workmen and passers-by on and off the site. Adjacent property shall be fully protected throughout the operations.

STORM DRAINAGE UTILITIES
SECTION 33 4000
3595001

Blasting will not be permitted. Prevent damage to adjoining improvements and properties both above and below grade. Restore such improvements to original condition should damage occur. Replace trees and shrubs outside building area disturbed by operations.

- B. In accordance with generally accepted construction practices, the Contractor shall be solely and completely responsible for working conditions at the job site, including safety of all persons and property during performance of the work. This requirement shall apply continuously and shall not be limited to normal working hours.
- C. Any construction review of the Contractor's performance conducted by the Geotechnical Engineer is not intended to include review of the adequacy of the Contractor's safety measures, in, on, or near the construction site.
- D. Provide shoring, sheeting, sheet piles and/or bracing to prevent caving, erosion or gullyng of sides of excavation.
- E. Surface Drainage: Provide for surface drainage during period of construction in manner to avoid creating nuisance to adjacent areas. The contractor shall make a reasonable effort on a daily basis to provide pumps and all equipment necessary to keep all excavations and the site free from water during entire progress of work, regardless of cause, source, or nature of water.
- F. Adjacent streets and sidewalks shall be kept free of mud, dirt or similar nuisances resulting from earthwork operations.
- G. The site and adjacent influenced areas shall be watered as required to suppress dust nuisance. Dust control measures shall be in accordance with the local jurisdiction.
- H. Trees: Carefully protect existing trees that are to remain.

1.12 SEASONAL LIMITS

- A. No fill material shall be placed, spread or rolled during unfavorable weather conditions. When work is interrupted by rains, fill operations shall not be resumed until field tests indicate that moisture content and density of fill are satisfactory.

1.13 TESTING

- A. General: Refer to Section 01 4523 – Testing and Inspection Services, and Structural Tests and Inspections List, DSA-103.
- B. Geotechnical Engineer: Owner is retaining a Geotechnical Engineer to determine compliance of fill with Specifications, and to direct adjustments in fill operations. Costs of Geotechnical Engineer will be borne by Owner; except those costs incurred for re-tests or re-inspection will be paid by Owner and backcharged to Contractor.

1.14 RECORD DRAWINGS

- A. Keep a daily record of all pipe placed in ground, verified by Project Inspector.

STORM DRAINAGE UTILITIES
SECTION 33 4000
3595001

- B. Upon completion of this Contract, furnish one tracing showing all outside utility lines, piping, etc., installed under this Contract. Locate and dimension all work with reference to permanent landmarks.
- C. All symbols and designations used in preparing "RECORD" drawings shall match those used in Contract drawings.
- D. Properly identify all stubs for future connections, as to location and use, by setting of concrete marker at finished grade in the manner suitable to Architect.

PART 2 - PRODUCTS

2.1 DESIGN AND PERFORMANCE CRITERIA

- A. Sustainable Design:
 - 1. VOC emissions for field-applied adhesives, sealants, and sealant primers must comply with limits specified in Section 01 6116.
 - 2. VOC emissions for field-applied paints and coatings must comply with limits specified in Section 01 6116.

2.2 MATERIALS

- A. Pipe: Use one of the following, unless noted on the Drawings otherwise.
 - 1. Polyvinyl Chloride Pipe (PVC): SDR35 conforming to ASTM D3034 with elastomeric joints conforming to ASTM D3212 for pipe to 12". Sun damaged pipe will be rejected.
 - 2. High density polyethylene pipe (HDPE): The pipe shall be corrugated exterior/smooth interior pipe. 12" to 60" maximum diameter shall conform to AASHTO M294, water tight per ASTM D3212 with water tight gasket fittings.
- B. Perforated Pipe (for subdrains): Shall be ADS N12 pipe, 3 hole, ASTM F 405, AASHTO M 252; PCV ASTM D3034 SDR-35 storm drain pipe
- C. Manhole: Shall be as shown on the drawing details.
- D. Drop Inlet: Shall be as shown on the drawing details.
- E. Curb Inlet: Shall be as shown on the drawing details.
- F. Mortar: For pipe connections to concrete drainage structures, conform to ASTM C270 type N mortar. Place within one half hour after adding water.
- G. Crushed Rock: Imported washed crushed rock. Minimum 100% passing 3/4 inch sieve.
- H. Trench drain: Polycast, Polydrain or equal and as shown on drawings.
- I. Area Drains: Shall be as shown on the drawing details.

STORM DRAINAGE UTILITIES
SECTION 33 4000
3595001

- J. Floor Drains: Shall be as shown on the drawing details.
- K. Clean-outs: Shall be as shown on the drawing details.
- L. Planter drains: Shall be as detailed on the drawing details.
- M. Filter Fabric: Mirafi 140N.

PART 3 - EXECUTION

3.1 INSPECTION LAYOUT AND PREPARATION

- A. Prior to installation of the work of this Section, carefully inspect and verify by field measurements that installed work of all other trades is complete to the point where this installation may properly commence
- B. Layout all work, establish grades, locate existing underground utilities, set markers and stakes, setup and maintain barricades and protection facilities; all prior to beginning actual earthwork operations. Layout and staking shall be done by a licensed Land Surveyor or Professional Civil Engineer.
- C. Verify that specified items may be installed in accordance with the approved design.
- D. In event of discrepancy, immediately notify Owner and the Architect. Do not proceed in discrepant areas until discrepancies have been fully resolved.

3.2 EXCAVATION AND BACKFILLING

- A. General: Installation shall be in strict conformance with referenced standards, the manufacturer's written directions, as shown on the drawings and as herein specified.
- B. Verify invert elevations at points of connection to existing systems prior to any excavation. If invert elevations differ from that shown on drawings, notify Architect immediately.
- C. Excavation and Bedding:
 - 1. General: Trench straight and true to line and grade with bottom smooth and free of irregularities or rock points. Trench width in accordance with pipe manufacturer's recommendations and as per the drawings. Follow manufacturer's recommendations for use of each kind and type of pipe.
 - 2. Bedding: Provide bedding as detailed on plans for the full length of the pipe. Bedding shall have a minimum thickness beneath the pipe of 4" or 1/8 the outside diameter of the pipe, whichever is greater. Provide bell holes and depressions for pipe joints only of size required to properly make joint.
 - 3. If the trenches for the site drainage fall within areas to be lime treated, the piping shall be installed prior to any lime treatment operations.
 - a. If additional piping is added to previously lime treated areas, the contractor shall backfill the trench with class 2 aggregate base and compact to 95%.

D. Laying of Pipe:

1. General: Inspect pipe prior to placing. Set aside any defective or damaged material. Do not place pipe in water nor place pipe when trenches or weather are unsuitable. Lay pipe upgrade, true to line and grade.
2. Bell and Spigot Joints: Lubricate inside of bells and outside of spigots with soap solution or as recommended by manufacture. Wedge joints tight. Bell of bell and spigot pipe to be pointed upgrade.
3. Pipe shall be bedded uniformly throughout its length.
4. Pipe elevation shall be within 0.02 feet of design elevation as shown on plans.
5. Off Site Work: All work beyond the property lines shall be done in strict conformance with the requirements of the governing agency.

E. Backfilling:

1. General: Do not start backfill operations until required testing has been accomplished.
2. Trenches and Excavations: Backfill with material as detailed on plans, filling both sides of the pipe at the same time, carefully tamping to hold pipe in place without movement. Refer to Section 31 2333 – TRENCHING AND BACKFILLING for fill above this layer.

F. Grouting of Pipes: Grout pipes smooth and water tight at drop inlet, manholes, and curb inlets. Grout back side of hood at curb inlets all grouting shall be smooth and consistent.

G. Off Site Work: All work beyond the property lines shall be done in strict conformance with the requirements of the local agency.

H. Cutting and Patching: Remove and replace existing surface features per applicable specification section (i.e. asphaltic concrete or concrete paving) where pipe is installed in areas of existing improvements.

3.3 TOLERANCES

A. Storm Drain structure grates

1. In landscape and lawn areas $\pm 0.05'$.
2. In sidewalk and asphalt pavement $\pm 0.025'$.
3. In curb and gutter application $\pm 0.0125'$.

B. Cleanout Boxes and Lids

1. In landscape areas; 0.10 higher than surrounding finish grade, $\pm 0.05'$.
2. In sidewalks and asphalt pavement; Flush with surrounding finish grade, $\pm 0.025'$.

3.4 DEWATERING

A. Contractor to provide trench dewatering as necessary, no matter what the source is, at no additional cost to the owner.

STORM DRAINAGE UTILITIES
SECTION 33 4000
3595001

3.5 FLUSHING

- A. The Contractor shall thoroughly ball and flush the storm drain system to remove all dirt and debris. Discharge water to an approved location.

3.6 CLEANING

- A. Upon completion of work of this Section promptly remove from the working area all scraps, debris and surplus material of this Section.
- B. Clean the dirt, rocks, and debris from the drop inlets and storm drain manholes.

END OF SECTION

**Melville Jacobson Elementary
School - Shade Structures**

1750 W. Kavanagh Ave., Tracy, CA 95376

3595001

Tracy Unified School District

1875 W Lowell Ave., Tracy, CA 95376

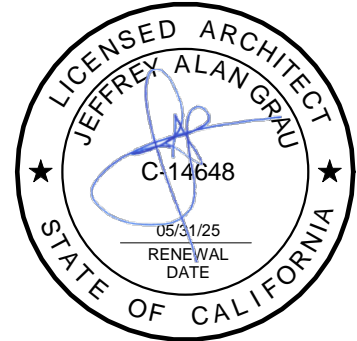


May 16, 2024

Melville Jacobson Elementary School - Shade Structures
Tracy Unified School District
Tracy, California

May 16, 2024

HMC # 3595001



HMC ARCHITECTS
Architect



Warren Consulting Engineers
Civil Engineer

TABLE OF CONTENTS

DIVISION 00 - PROCUREMENT AND CONTRACTING REQUIREMENTS - NOT USED

DIVISION 01 - GENERAL REQUIREMENTS

SECTION	01 1100 - Summary of Work
	01 2100 - Allowance
	01 2513 - Product Options and Substitutions
	01 2600 - Changes in the Work
	01 2900 - Application for Payment and Conditional and Unconditional Waiver and Release Forms
	01 3119 - Project Meetings
	01 3213 - Scheduling of Work
	01 3300 - Submittal (Including Submittal Transmittal, Substitution Request, RFI, Electronic Data Request, Certification of Compliance for Building Materials, Roof Certification)
	01 3513.23 - Site Standards
	01 3516 - Alteration Project Procedures
	01 3543 - Environmental Procedures
	01 4100 - Regulatory Requirements
	01 4213 - Abbreviations and Acronyms
	01 4216 - Definitions
	01 4219 - References
	01 4300 - Materials and Equipment
	01 4500 - Quality Control
	01 4516 - Field Quality Control Procedures
	01 4523 - Testing and Inspection Services
	01 5000 - Temporary Facilities and Controls
	01 5013 - Construction Waste Management and Disposal
	01 5213 - Field Offices
	01 5639 - Temporary Tree Protection
	01 5713.10 - Erosion Control
	01 6116.10 - Volatile Organic Compound (VOC) Restrictions
	01 6600 - Product Delivery Storage and Handling
	01 7123 - Field Engineering
	01 7329 - Cutting and Patching
	01 7419 - Construction Waste Management and Disposal
	01 7419A - Contractor's Construction Waste and Recycling Plan
	01 7419B - Contractor's Reuse, Recycling and Disposal Report
	01 7600 - Alteration Project Procedures
	01 7700 - Contract Closeout and Final Cleaning
	01 7823 - Operation and Maintenance Data
	01 7836 - Warranties (Including Contractor Standard Warranty Form, Subcontractor Standard Warranty Form, Special Extended Warranty Form)
	01 7839 - Record Documents
	01 8113.10 - Sustainable Design Requirements

DIVISION 02 - EXISTING CONDITIONS - NOT USED

DIVISION 03 - CONCRETE - NOT USED

DIVISION 04 - MASONRY - NOT USED

DIVISION 05 - METALS - NOT USED

DIVISION 06 - WOOD, PLASTICS, AND COMPOSITES - NOT USED

DIVISION 07 - THERMAL AND MOISTURE PROTECTION - NOT USED

TABLE OF CONTENTS

DIVISION 08 - OPENINGS - NOT USED

DIVISION 09 - FINISHES

SECTION 09 2900 - Gypsum Board
 09 3000 - Tiling
 09 9100 - Painting

DIVISION 10 - SPECIALTIES

SECTION 10 1400 - Signage
 10 2813 - Toilet Accessories

DIVISION 11 - EQUIPMENT - NOT USED

DIVISION 12 - FURNISHINGS - NOT USED

DIVISION 13 - SPECIAL CONSTRUCTION - NOT USED

DIVISION 14 - CONVEYING EQUIPMENT - NOT USED

DIVISION 21 - FIRE SUPPRESSION - NOT USED

DIVISION 22 - PLUMBING - NOT USED

DIVISION 23 - HEATING, VENTILATING AND AIR CONDITIONING (HVAC) - NOT USED

DIVISION 26 - ELECTRICAL - NOT USED

DIVISION 27 - COMMUNICATIONS - NOT USED

DIVISION 28 - ELECTRONIC SAFETY AND SECURITY - NOT USED

DIVISION 31 - EARTHWORK

SECTION 31 0000 - Earthwork
 31 2333 - Trenching and Backfilling

DIVISION 32 - EXTERIOR IMPROVEMENTS

SECTION 32 1200 - Asphalt Concrete Paving
 32 1600 - Site Concrete
 32 1816.13 - Playground Protective Surfaces
 32 1816.16 - Synthetic Turf
 32 3113 - Chain Link Fences and Gates

DIVISION 33 - UTILITIES

SECTION 33 0000 - Utilities
 33 4000 - Storm Drainage Utilities

SUMMARY OF WORK

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Site Access Conditions and Requirements;
- B. Special Conditions.

1.02 SUMMARY OF WORK COVERED BY CONTRACT DOCUMENTS

- A. The Work of this Contract consists of the following at Wanda Hirsch Elementary School:
 - (1) Construction and installation of 2 - 30'x'40' Four Post hip PC shade structure, 1 - 20'x60' Joined Hip PC shade structure, 2 - play apparatus with poured in place rubber surfacing, existing restroom upgrades and related civil and landscape upgrades.

1.03 CONTRACTS

- A. Perform the Work under a single, fixed-price Contract.

1.04 WORK BY OTHERS

- A. Fabrication of the shade structures and play apparatus.

1.05 CODES, REGULATIONS, AND STANDARDS

- A. The codes, regulations, and standards adopted by the state and federal agencies having jurisdiction shall govern minimum requirements for this Project. Where codes, regulations, and standards conflict with the Contract Documents, these conflicts shall be brought to the immediate attention of the District and the Architect.
- B. Codes, regulations, and standards shall be as published effective as of date of bid opening, unless otherwise specified or indicated.

1.06 PROJECT RECORD DOCUMENTS

- A. Contractor shall maintain on Site one set of the following record documents; Contractor shall record actual revisions to the Work:
 - (1) Contract Drawings.

- (2) Specifications.
 - (3) Addenda.
 - (4) Change Orders and other modifications to the Contract.
 - (5) Reviewed shop drawings, product data, and samples.
 - (6) Field test records.
 - (7) Inspection certificates.
 - (8) Manufacturer's certificates.
- B. Contractor shall store Record Documents separate from documents used for construction. Provide files, racks, and secure storage for Record Documents and samples.
 - C. Contractor shall record information concurrent with construction progress.
 - D. Specifications: Contractor shall legibly mark and record at each product section of the Specifications the description of the actual product(s) installed, including the following:
 - (1) Manufacturer's name and product model and number.
 - (2) Product substitutions or alternates utilized.
 - (3) Changes made by Addenda and Change Orders and written directives.

1.07 EXAMINATION OF EXISTING CONDITIONS

- A. Contractor shall be held to have examined the Project Site and acquainted itself with the conditions of the Site and of the streets or roads approaching the Site.
- B. Prior to commencement of Work, Contractor shall survey the Site and existing buildings and improvements to observe existing damage and defects such as cracks, sags, broken, missing or damaged glazing, other building elements and Site improvements, and other damage.
- C. Should Contractor observe cracks, sags, and other damage to and defects of the Site and adjacent buildings, paving, and other items not indicated in the Contract Documents, Contractor shall immediately report same to the District and the Architect.

1.08 CONTRACTOR'S USE OF PREMISES

- A. If unoccupied and only with District's prior written approval, Contractor may use the building(s) at the Project Site without limitation for its operations, storage, and office facilities for the performance of the Work. If the District chooses to beneficially occupy any building(s), Contractor must obtain the District's written approval for Contractor's use of spaces and types of

operations to be performed within the building(s) while so occupied. Contractor's access to the building(s) shall be limited to the areas indicated.

- B. If the space at the Project Site is not sufficient for Contractor's operations, storage, office facilities and/or parking, Contractor shall arrange and pay for any additional facilities needed by Contractor.
- C. Contractor shall not interfere with use of or access to occupied portions of the building(s) or adjacent property.
- D. Contractor shall maintain corridors, stairs, halls, and other exit-ways of building clear and free of debris and obstructions at all times.
- E. No one other than those directly involved in the demolition and construction, or specifically designated by the District or the Architect shall be permitted in the areas of work during demolition and construction activities.
- F. The Contractor shall install the construction fence and maintain that it will be locked when not in use. Keys to this fencing will be provided to the District.

1.09 PROTECTION OF EXISTING STRUCTURES AND UTILITIES

- A. The Drawings show above-grade and below-grade structures, utility lines, and other installations that are known or believed to exist in the area of the Work. Contractor shall locate these existing installations before proceeding with excavation and other operations that could damage same; maintain them in service, where appropriate; and repair damage to them caused by the performance of the Work. Should damage occur to these existing installations, the costs of repair shall be at the Contractor's expense and made to the District's satisfaction.
- B. Contractor shall be alert to the possibility of the existence of additional structures and utilities. If Contractor encounters additional structures and utilities, Contractor will immediately report to the District for disposition of same as indicated in the General Conditions.

1.10 UTILITY SHUTDOWNS AND INTERRUPTIONS

- A. Contractor shall give the District a minimum of three (3) days written notice in advance of any need to shut off existing utility services or to effect equipment interruptions. The District will set exact time and duration for shutdown, and will assist Contractor with shutdown. Work required to re-establish utility services shall be performed by the Contractor.
- B. Contractor shall obtain District's written approval as indicated in the General Conditions in advance of deliveries of material or equipment or other activities that may conflict with District's use of the building(s) or adjacent facilities.

1.11 STRUCTURAL INTEGRITY

- A. Contractor shall be responsible for and supervise each operation and work that could affect structural integrity of various building elements, both permanent and temporary.

- B. Contractor shall include structural connections and fastenings as indicated or required for complete performance of the Work.

PART 2 – PRODUCTS Not Used.

PART 3 – EXECUTION Not Used.

END OF DOCUMENT

ALLOWANCE

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Non-specified work.

1.2 RELATED SECTIONS

A. Document 01 10 00 (Summary of Work)

B. Document 01 29 00 (Application for Payment)

C. Document 01 33 00 (Submittal Procedures)

1.3 ALLOWANCES

- A. Included in the Contract, a stipulated sum/price of **[INSERT AMOUNT]** as an allowance for DSA Revisions within the limits set forth in the Contract Documents. This Allowance shall not be utilized without written approval by the District.
- B. Contractor's costs, without overhead and profit, for products, delivery, installation, labor, insurance, payroll, taxes, bonding and equipment rental will be included in Allowance Expenditure Directive authorizing expenditure of funds from this Allowance. No overhead and profit shall be added to the Allowance Expenditure Directive.
- C. Funds will be drawn from Allowance only with District approval evidenced by an Allowance Expenditure Directive.
- D. At Contract closeout, funds remaining in Allowance will be credited to District by Change Order.
- E. Whenever costs are more than the Allowance, the amount covered by the Allowance will be approved at cost. The Contract Price shall be adjusted by Change Order for amounts in excess of the Allowance.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

END OF DOCUMENT

PRODUCT OPTIONS AND SUBSTITUTIONS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. Instructions to Bidders;
- B. General Conditions, including, without limitation, Substitutions For Specified Items; and
- C. Special Conditions.

1.02 SUBSTITUTIONS OF MATERIALS AND EQUIPMENT

- A. Catalog numbers and specific brands or trade names followed by the designation "or equal" are used in conjunction with material and equipment required by the Specifications to establish the standards of quality, utility, and appearance required. Substitutions which are equal in quality, utility, and appearance to those specified may be reviewed subject to the provisions of the General Conditions.
- B. Wherever more than one manufacturer's product is specified, the first-named product is the basis for the design used in the work and the use of alternative-named manufacturers' products or substitutes may require modifications in that design. If such alternatives are proposed by Contractor and are approved by the District and/or the Architect, Contractor shall assume all costs required to make necessary revisions and modifications of the design resulting from the substitutions requested by the Contractor.
- C. When materials and equipment are specified by first manufacturer's name and product number, second manufacturer's name and "or approved equal," supporting data for the second product, if proposed by Contractor, shall be submitted in accordance with the requirements for substitutions. The District's Board has found and determined that certain item(s) shall be used on this Project based on the purpose(s) indicated pursuant to Public Contract Code section 3400(c). These findings, as well as the products and brand or trade names, have been identified in the Notice to Bidders.
- D. The Contractor will not be allowed to substitute specified items unless the request for substitution is submitted as follows:
 - (1) District must receive any notice of request for substitution of a specified item a minimum of ten (10) calendar days prior to bid opening.

- (2) Within 35 days after the date of the Notice of Award, the Contractor shall submit data substantiating the request(s) for all substitution(s) containing sufficient information to assess acceptability of product or system and impact on Project, including, without limitation, the requirements specified in the Special Conditions and the technical Specifications. Insufficient information shall be grounds for rejection of substitution.
- E. If the District and/or Architect, in reviewing proposed substitute materials and equipment, require revisions or corrections to be made to previously accepted Shop Drawings and supplemental supporting data to be resubmitted, Contractor shall promptly do so. If any proposed substitution is judged by the District and/or Architect to be unacceptable, the specified material or equipment shall be provided.
- F. Samples may be required. Tests required by the District and/or Architect for the determination of quality and utility shall be made at the expense of Contractor, with acceptance of the test procedure first given by the District.
- G. In reviewing the supporting data submitted for substitutions, the District and/or Architect will use for purposes of comparison all the characteristics of the specified material or equipment as they appear in the manufacturer's published data even though all the characteristics may not have been particularly mentioned in the Contract Documents. If more than two (2) submissions of supporting data are required, the cost of reviewing the additional supporting data shall be borne by Contractor, and the District will deduct the costs from the Contract Price. The Contractor shall be responsible for any re-design costs occasioned by District's acceptance and/or approval of any substitute.
- H. The Contractor shall, in the event that a substitute is less costly than that specified, credit the District with one hundred percent (100%) of the net difference between the substitute and the originally specified material. In this event, the Contractor agrees to execute a deductive Change Order to reflect that credit. In the event Contractor furnishes a material, process, or article more expensive than that specified, the difference in the cost of that material, process, or article so furnished shall be borne by Contractor.
- I. In no event shall the District be liable for any increase in Contract Price or Contract Time due to any claimed delay in the evaluation of any proposed substitute or in the acceptance or rejection of any proposed substitute.

PART 2 – PRODUCTS Not Used.

PART 3 – EXECUTION Not Used.

END OF DOCUMENT

DOCUMENT 01 26 00

CHANGES IN THE WORK

CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE PROVISIONS IN THE AGREEMENT, GENERAL CONDITIONS, AND SPECIAL CONDITIONS, IF USED, RELATED TO CHANGES AND/OR REQUESTS FOR CHANGES.

END OF DOCUMENT

DOCUMENT 01 29 00

**APPLICATION FOR PAYMENT AND
CONDITIONAL AND UNCONDITIONAL WAIVER AND RELEASE FORMS**

**CONTRACTOR SHALL COMPLY WITH ALL PROVISIONS IN THE GENERAL
CONDITIONS RELATED TO APPLICATIONS FOR PAYMENT AND/OR PAYMENTS.**

**CONDITIONAL WAIVER AND RELEASE
ON PROGRESS PAYMENT
(CIVIL CODE SECTION 8132)**

NOTICE: THIS DOCUMENT WAIVES THE CLAIMANT'S LIEN, STOP PAYMENT NOTICE, AND PAYMENT BOND RIGHTS EFFECTIVE ON RECEIPT OF PAYMENT. A PERSON SHOULD NOT RELY ON THIS DOCUMENT UNLESS SATISFIED THAT THE CLAIMANT HAS RECEIVED PAYMENT.

Name of Claimant: _____

Name of Customer: _____

Job Location: _____

Owner: _____

Through Date: _____

Conditional Waiver and Release

This document waives and releases lien, stop payment notice, and payment bond rights the claimant has for labor and service provided, and equipment and material delivered, to the customer on this job through the Through Date of this document. Rights based upon labor or service provided, or equipment or material delivered, pursuant to a written change order that has been fully executed by the parties prior to the date that this document is signed by the claimant, are waived and released by this document, unless listed as an Exception below. This document is effective only on the claimant's receipt of payment from the financial institution on which the following check is drawn:

Maker of Check: _____

Amount of Check: \$_____

Check Payable to: _____

Exceptions

This document does not affect any of the following:

- (1) Retentions.
- (2) Extras for which the claimant has not received payment.
- (3) The following progress payments for which the claimant has previously given a conditional waiver and release but has not received payment:

Date(s) of waiver and release: _____

Amount(s) of unpaid progress payment(s): \$_____

TRACY UNIFIED SCHOOL DISTRICT

**APPLICATION FOR PAYMENT AND
CONDITIONAL AND UNCONDITIONAL
WAIVER AND RELEASE FORMS
DOCUMENT 01 29 00-2**

- (4) Contract rights, including (A) a right based on rescission, abandonment, or breach of contract, and (B) the right to recover compensation for work not compensated by the payment.

Claimant's Signature: _____

Claimant's Title: _____

Date of Signature: _____

**UNCONDITIONAL WAIVER AND RELEASE
ON PROGRESS PAYMENT
(CIVIL CODE SECTION 8134)**

NOTICE TO CLAIMANT: THIS DOCUMENT WAIVES AND RELEASES LIEN, STOP PAYMENT NOTICE, AND PAYMENT BOND RIGHTS UNCONDITIONALLY AND STATES THAT YOU HAVE BEEN PAID FOR GIVING UP THOSE RIGHTS. THIS DOCUMENT IS ENFORCEABLE AGAINST YOU IF YOU SIGN IT, EVEN IF YOU HAVE NOT BEEN PAID. IF YOU HAVE NOT BEEN PAID, USE A CONDITIONAL WAIVER AND RELEASE FORM.

Name of Claimant: _____

Name of Customer: _____

Job Location: _____

Owner: _____

Through Date: _____

Unconditional Waiver and Release

This document waives and releases lien, stop payment notice, and payment bond rights the claimant has for labor and service provided, and equipment and material delivered, to the customer on this job through the Through Date of this document. Rights based upon labor or service provided, or equipment or material delivered, pursuant to a written change order that has been fully executed by the parties prior to the date that this document is signed by the claimant, are waived and released by this document, unless listed as an Exception below. The claimant has received the following progress payment: \$_____

Exceptions

This document does not affect any of the following:

- (1) Retentions.
- (2) Extras for which the claimant has not received payment.
- (3) Contract rights, including (A) a right based on rescission, abandonment, or breach of contract, and (B) the right to recover compensation for work not compensated by the payment.

Claimant's Signature: _____

Claimant's Title: _____

Date of Signature: _____

**CONDITIONAL WAIVER AND RELEASE
ON FINAL PAYMENT**
(CIVIL CODE SECTION 8136)

NOTICE: THIS DOCUMENT WAIVES THE CLAIMANT'S LIEN, STOP PAYMENT NOTICE, AND PAYMENT BOND RIGHTS EFFECTIVE ON RECEIPT OF PAYMENT. A PERSON SHOULD NOT RELY ON THIS DOCUMENT UNLESS SATISFIED THAT THE CLAIMANT HAS RECEIVED PAYMENT.

Name of Claimant: _____

Name of Customer: _____

Job Location: _____

Owner: _____

Conditional Waiver and Release

This document waives and releases lien, stop payment notice, and payment bond rights the claimant has for labor and service provided, and equipment and material delivered, to the customer on this job. Rights based upon labor or service provided, or equipment or material delivered, pursuant to a written change order that has been fully executed by the parties prior to the date that this document is signed by the claimant, are waived and released by this document, unless listed as an Exception below. This document is effective only on the claimant's receipt of payment from the financial institution on which the following check is drawn:

Maker of Check:

Amount of Check: \$_____

Check Payable to: _____

Exceptions

This document does not affect any of the following: _____

Disputed claims for extras in the amount of: \$_____

Claimant's Signature: _____

Claimant's Title: _____

Date of Signature: _____

**UNCONDITIONAL WAIVER AND RELEASE
ON FINAL PAYMENT**
(CIVIL CODE SECTION 8138)

NOTICE TO CLAIMANT: THIS DOCUMENT WAIVES AND RELEASES LIEN, STOP PAYMENT NOTICE, AND PAYMENT BOND RIGHTS UNCONDITIONALLY AND STATES THAT YOU HAVE BEEN PAID FOR GIVING UP THOSE RIGHTS. THIS DOCUMENT IS ENFORCEABLE AGAINST YOU IF YOU SIGN IT, EVEN IF YOU HAVE NOT BEEN PAID. IF YOU HAVE NOT BEEN PAID, USE A CONDITIONAL WAIVER AND RELEASE FORM.

Name of Claimant: _____

Name of Customer: _____

Job Location: _____

Owner: _____

Unconditional Waiver and Release

This document waives and releases lien, stop payment notice, and payment bond rights the claimant has for all labor and service provided, and equipment and material delivered, to the customer on this job. Rights based upon labor or service provided, or equipment or material delivered, pursuant to a written change order that has been fully executed by the parties prior to the date that this document is signed by the claimant, are waived and released by this document, unless listed as an Exception below. The claimant has been paid in full.

Exceptions

This document does not affect any of the following: _____

Disputed claims for extras in the amount of: \$_____

Claimant's Signature: _____

Claimant's Title: _____

Date of Signature: _____

PROJECT MEETINGS

PART 1 – GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions; and
- B. Special Conditions.

1.02 PROGRESS MEETINGS:

- A. Contractor shall schedule and hold regular weekly progress meetings after a minimum of one week's prior written notice of the meeting date and time to all Invitees as indicated below.
- B. Location: Contractor's field office.
- C. The Contractor shall notify and invite the following entities ("Invitees"):
 - (1) District Representative.
 - (2) Contractor.
 - (3) Contractor's Project Manager.
 - (4) Contractor's Superintendent.
 - (5) Subcontractors, as appropriate to the agenda of the meeting.
 - (6) Suppliers, as appropriate to the agenda of the meeting.
 - (7) Construction Manager, if any.
 - (8) Architect
 - (9) Engineer(s), if any and as appropriate to the agenda of the meeting.
 - (10) Others, as appropriate to the agenda of the meeting.
- D. The District's and/or the Architect's Consultants will attend at their discretion, in response to the agenda.
- E. The District representative, the Construction Manager, and/or another District Agent shall take and distribute meeting notes to attendees and other concerned parties. If exceptions are taken to anything in the meeting notes,

those exceptions shall be stated in writing to the District within five (5) working days following District's distribution of the meeting notes.

1.03 PRE-INSTALLATION/PERFORMANCE MEETING:

- A. Contractor shall schedule a meeting prior to the start of each of the demolition work phases. Contractor shall invite all Invitees to this meeting, and others whose work may affect or be affected by the quality of the demolition work.
- B. Contractor shall review in detail prior to this meeting, the manufacturer's requirements and specifications, applicable portions of the Contract Documents, Shop Drawings, and other submittals, and other related work. At this meeting, invitees shall review and resolve conflicts, incompatibilities, or inadequacies discovered or anticipated.
- C. Contractor shall review in detail Project conditions, schedule, requirements for performance, application, installation, and quality of completed Work, and protection of adjacent Work and property.
- D. Contractor shall review in detail means of protecting the completed Work during the remainder of the construction period.

PART 2 - PRODUCTS Not Used.

PART 3 - EXECUTION Not Used.

END OF DOCUMENT

SCHEDULING OF WORK

PART 1 – GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions;
- B. Special Conditions;
- C. Summary of Work; and
- D. Submittals.

1.02 SECTION INCLUDES

- A. Scheduling of Work under this Contract shall be performed by Contractor in accordance with requirements of this Section.
 - (1) Development of schedule, cost and resource loading of the schedule, monthly payment requests, and project status reporting requirements of the Contract shall employ computerized Critical Path Method ("CPM") scheduling ("CPM Schedule").
 - (2) CPM Schedule shall be cost loaded based on Schedule of Values as approved by District.
 - (3) Submit schedules and reports as specified in the General Conditions.
- B. Upon Award of Contract, Contractor shall immediately commence development of Initial and Original CPM Schedules to ensure compliance with CPM Schedule submittal requirements.

1.03 CONSTRUCTION SCHEDULE

- A. Within ten (10) days of issuance of the issuance Notice to Proceed and before request for first progress payment, the Contractor shall prepare and submit to the Project Manager a construction progress schedule conforming to the Milestone Schedule below.
- B. The Construction Schedule shall be continuously updated, and an updated schedule shall be submitted with each application for progress payment. Each revised schedule shall indicate the work actually accomplished during the previous period and the schedule for completion of the remaining work.

C. Milestone Schedule:

ACTIVITY DESCRIPTION

REQUIRED COMPLETION

CONSTRUCTION STARTS

05-26-2022

PHASE 1 DEMOLITION

PHASE 2 DEMOLITION

FINAL PROJECT COMPLETION

1.04 QUALIFICATIONS

- A. Contractor shall employ experienced scheduling personnel qualified to use the latest version of [i.e., Primavera Project Planner]. Experience level required is set forth below. Contractor may employ such personnel directly or may employ a consultant for this purpose.
- (1) The written statement shall identify the individual who will perform CPM scheduling.
 - (2) Capability and experience shall be verified by description of construction projects on which individual has successfully applied computerized CPM.
 - (3) Required level of experience shall include at least two (2) projects of similar nature and scope with value not less than three fourths ($\frac{3}{4}$) of the Total Bid Price of this Project. The written statement shall provide contact persons for referenced projects with current telephone and address information.
- B. District reserves the right to approve or reject Contractor's scheduler or consultant at any time. District reserves the right to refuse replacing of Contractor's scheduler or consultant, if District believes replacement will negatively affect the scheduling of Work under this Contract.

1.05 GENERAL

- A. Progress Schedule shall be based on and incorporate milestone and completion dates specified in Contract Documents.
- B. Overall time of completion and time of completion for each milestone shown on Progress Schedule shall adhere to times in the Contract, unless an earlier (advanced) time of completion is requested by Contractor and agreed to by District. Any such agreement shall be formalized by a Change Order.
- (1) District is not required to accept an early completion schedule, i.e., one that shows an earlier completion date than the Contract Time.
 - (2) Contractor shall not be entitled to extra compensation in event agreement is reached on an earlier completion schedule and Contractor completes its Work, for whatever reason, beyond completion date shown in its early completion schedule but within the Contract Time.

- (3) A schedule showing the work completed in less than the Contract Time, and that has been accepted by District, shall be considered to have Project Float. The Project Float is the time between the scheduled completion of the work and the Completion Date. Project Float is a resource available to both District and the Contractor.
- C. Ownership Project Float: Neither the District nor Contractor owns Project Float. The Project owns the Project Float. As such, liability for delay of the Completion Date rests with the party whose actions, last in time, actually cause delay to the Completion Date.
 - (1) For example, if Party A uses some, but not all of the Project Float and Party B later uses remainder of the Project Float as well as additional time beyond the Project Float, Party B shall be liable for the time that represents a delay to the Completion Date.
 - (2) Party A would not be responsible for the time since it did not consume the entire Project Float and additional Project Float remained; therefore, the Completion Date was unaffected by Party A.
- D. Progress Schedule shall be the basis for evaluating job progress, payment requests, and time extension requests. Responsibility for developing Contract CPM Schedule and monitoring actual progress as compared to Progress Schedule rests with Contractor.
- E. Failure of Progress Schedule to include any element of the Work, or any inaccuracy in Progress Schedule, will not relieve Contractor from responsibility for accomplishing the Work in accordance with the Contract. District's acceptance of schedule shall be for its use in monitoring and evaluating job progress, payment requests, and time extension requests and shall not, in any manner, impose a duty of care upon District, or act to relieve Contractor of its responsibility for means and methods of construction.
- F. Software: Use [i.e, District Project Planner for Windows, latest version]. Such software shall be compatible with Windows operating system. Contractor shall transmit contract file to District on compact disk at times requested by District.
- G. Transmit each item under the form approved by District.
 - (1) Identify Project with District Contract number and name of Contractor.
 - (2) Provide space for Contractor's approval stamp and District's review stamps.
 - (3) Submittals received from sources other than Contractor will be returned to the Contractor without District's review.

1.06 INITIAL CPM SCHEDULE

- A. Initial CPM Schedule submitted for review at the pre-construction conference shall serve as Contractor's schedule for up to ninety (90) calendar days after the Notice to Proceed.

- B. Indicate detailed plan for the Work to be completed in first ninety (90) days of the Contract; details of planned mobilization of plant and equipment; sequence of early operations; procurement of materials and equipment. Show Work beyond ninety (90) calendar days in summary form.
- C. Initial CPM Schedule shall be time scaled.
- D. Initial CPM Schedule shall be cost and resource loaded. Accepted cost and resource loaded schedule will be used as basis for monthly progress payments until acceptance of the Original CPM Schedule. Use of Initial CPM Schedule for progress payments shall not exceed ninety (90) calendar days.
- E. District and Contractor shall meet to review and discuss the Initial CPM Schedule within seven (7) calendar days after it has been submitted to District.
 - (1) District's review and comment on the schedule shall be limited to Contract conformance (with sequencing, coordination, and milestone requirements).
 - (2) Contractor shall make corrections to schedule necessary to comply with Contract requirements and shall adjust schedule to incorporate any missing information requested by District. Contractor shall resubmit Initial CPM Schedule if requested by District.
- F. If, during the first ninety (90) days after Notice to Proceed, the Contractor is of the opinion that any of the Work included on its Initial CPM Schedule has been impacted, the Contractor shall submit to District a written Time Impact Evaluation ("TIE") in accordance with Article 1.12 of this Section. The TIE shall be based on the most current update of the Initial CPM Schedule.

1.07 ORIGINAL CPM SCHEDULE

- A. Submit a detailed proposed Original CPM Schedule presenting an orderly and realistic plan for completion of the Work in conformance with requirements as specified herein.
- B. Progress Schedule shall include or comply with following requirements:
 - (1) Time scaled, cost and resource (labor and major equipment) loaded CPM schedule.
 - (2) No activity on schedule shall have duration longer than fifteen (15) work days, with exception of submittal, approval, fabrication and procurement activities, unless otherwise approved by District.
 - (a) Activity durations shall be total number of actual work days required to perform that activity.
 - (3) The start and completion dates of all items of Work, their major components, and milestone completion dates, if any.

- (4) District furnished materials and equipment, if any, identified as separate activities.
- (5) Activities for maintaining Project Record Documents.
- (6) Dependencies (or relationships) between activities.
- (7) Processing/approval of submittals and shop drawings for all material and equipment required per the Contract. Activities that are dependent on submittal acceptance or material delivery shall not be scheduled to start earlier than expected acceptance or delivery dates.
 - (a) Include time for submittals, re-submittals and reviews by District. Coordinate with accepted schedule for submission of Shop Drawings, samples, and other submittals.
 - (b) Contractor shall be responsible for all impacts resulting from re-submittal of Shop Drawings and submittals.
- (8) Procurement of major equipment, through receipt and inspection at jobsite, identified as separate activity.
 - (a) Include time for fabrication and delivery of manufactured products for the Work.
 - (b) Show dependencies between procurement and construction.
- (9) Activity description; what Work is to be accomplished and where.
- (10) The total cost of performing each activity shall be total of labor, material, and equipment, excluding overhead and profit of Contractor. Overhead and profit of the General Contractor shall be shown as a separate activity in the schedule. Sum of cost for all activities shall equal total Contract value.
- (11) Resources required (labor and major equipment) to perform each activity.
- (12) Responsibility code for each activity corresponding to Contractor or Subcontractor responsible for performing the Work.
- (13) Identify the activities which constitute the controlling operations or critical path. No more than twenty-five (25%) of the activities shall be critical or near critical. Near critical is defined as float in the range of one (1) to (10) days.
- (14) Twenty (20) workdays for developing punch list(s), completion of punch-list items, and final clean up for the Work or any designated portion thereof. No other activities shall be scheduled during this period.
- (15) Interface with the work of other contractors, District, and agencies such as, but not limited to, utility companies.

- (16) Show detailed Subcontractor Work activities. In addition, furnish copies of Subcontractor schedules upon which CPM was built.
 - (a) Also furnish for each Subcontractor, as determined by District, submitted on Subcontractor letterhead, a statement certifying that Subcontractor concurs with Contractor's Original CPM Schedule and that Subcontractor's related schedules have been incorporated, including activity duration, cost and resource loading.
 - (b) Subcontractor schedules shall be independently derived and not a copy of Contractor's schedule.
 - (c) In addition to Contractor's schedule and resource loading, obtain from electrical, mechanical, and plumbing Subcontractors, and other Subcontractors as required by District, productivity calculations common to their trades, such as units per person day, feet of pipe per day per person, feet of wiring per day per person, and similar information.
 - (d) Furnish schedule for Contractor/Subcontractor CPM schedule meetings which shall be held prior to submission of Original CPM schedule to District. District shall be permitted to attend scheduled meetings as an observer.
- (17) Activity durations shall be in Work days.
- (18) Submit with the schedule a list of anticipated non-Work days, such as weekends and holidays. The Progress Schedule shall exclude in its Work day calendar all non-Work days on which Contractor anticipates critical Work will not be performed.
- C. Original CPM Schedule Review Meeting: Contractor shall, within sixty (60) days from the Notice to Proceed date, meet with District to review the Original CPM Schedule submittal.
 - (1) Contractor shall have its Project Manager, Project Superintendent, Project Scheduler, and key Subcontractor representatives, as required by District, in attendance. The meeting will take place over a continuous one (1) day period.
 - (2) District's review will be limited to submittal's conformance to Contract requirements including, but not limited to, coordination requirements. However, review may also include:
 - (a) Clarifications of Contract Requirements.
 - (b) Directions to include activities and information missing from submittal.
 - (c) Requests to Contractor to clarify its schedule.

- (3) Within five (5) days of the Schedule Review Meeting, Contractor shall respond in writing to all questions and comments expressed by District at the Meeting.

1.08 ADJUSTMENTS TO CPM SCHEDULE

- A. Adjustments to Original CPM Schedule: Contractor shall have adjusted the Original CPM Schedule submittal to address all review comments from original CPM Schedule review meeting and resubmit network diagrams and reports for District's review.
 - (1) District, within ten (10) days from date that Contractor submitted the revised schedule, will either:
 - (a) Accept schedule and cost and resource loaded activities as submitted, or
 - (b) Advise Contractor in writing to review any part or parts of schedule which either do not meet Contract requirements or are unsatisfactory for District to monitor Project's progress, resources, and status or evaluate monthly payment request by Contractor.
 - (2) District may accept schedule with conditions that the first monthly CPM Schedule update be revised to correct deficiencies identified.
 - (3) When schedule is accepted, it shall be considered the "Original CPM Schedule" which will then be immediately updated to reflect the current status of the work.
 - (4) District reserves right to require Contractor to adjust, add to, or clarify any portion of schedule which may later be discovered to be insufficient for monitoring of Work or approval of partial payment requests. No additional compensation will be provided for such adjustments, additions, or clarifications.
- B. Acceptance of Contractor's schedule by District will be based solely upon schedule's compliance with Contract requirements.
 - (1) By way of Contractor assigning activity durations and proposing sequence of Work, Contractor agrees to utilize sufficient and necessary management and other resources to perform work in accordance with the schedule.
 - (2) Upon submittal of schedule update, updated schedule shall be considered "current" CPM Schedule.
 - (3) Submission of Contractor's schedule to District shall not relieve Contractor of total responsibility for scheduling, sequencing, and pursuing Work to comply with requirements of Contract Documents, including adverse effects such as delays resulting from ill-timed Work.

- C. Submittal of Original CPM Schedule, and subsequent schedule updates, shall be understood to be Contractor's representation that the Schedule meets requirements of Contract Documents and that Work shall be executed in sequence indicated on the schedule.
- D. Contractor shall distribute Original CPM Schedule to Subcontractors for review and written acceptance, which shall be noted on Subcontractors' letterheads to Contractor and transmitted to District for the record.

1.09 MONTHLY CPM SCHEDULE UPDATE SUBMITTALS

- A. Following acceptance of Contractor's Original CPM Schedule, Contractor shall monitor progress of Work and adjust schedule each month to reflect actual progress and any anticipated changes to planned activities.
 - (1) Each schedule update submitted shall be complete, including all information requested for the Original CPM Schedule submittal.
 - (2) Each update shall continue to show all Work activities including those already completed. These completed activities shall accurately reflect "as built" information by indicating when activities were actually started and completed.
- B. A meeting will be held on approximately the twenty-fifth (25th) of each month to review the schedule update submittal and progress payment application.
 - (1) At this meeting, at a minimum, the following items will be reviewed: Percent (%) complete of each activity; Time Impact Evaluations for Change Orders and Time Extension Request; actual and anticipated activity sequence changes; actual and anticipated duration changes; and actual and anticipated Contractor delays.
 - (2) These meetings are considered a critical component of overall monthly schedule update submittal and Contractor shall have appropriate personnel attend. At a minimum, these meetings shall be attended by Contractor's General Superintendent and Scheduler.
 - (3) Contractor shall plan on the meeting taking no less than four (4) hours.
- C. Within five (5) working days after monthly schedule update meeting, Contractor shall submit the updated CPM Schedule update.
- D. Within five (5) work days of receipt of above noted revised submittals, District will either accept or reject monthly schedule update submittal.
 - (1) If accepted, percent (%) complete shown in monthly update will be basis for Application for Payment by the Contractor. The schedule update shall be submitted as part of the Contractor's Application for Payment.

- (2) If rejected, update shall be corrected and resubmitted by Contractor before the Application for Payment is submitted.
- E. Neither updating, changing or revising of any report, curve, schedule, or narrative submitted to District by Contractor under this Contract, nor District's review or acceptance of any such report, curve, schedule or narrative shall have the effect of amending or modifying in any way the Completion Date or milestone dates or of modifying or limiting in any way Contractor's obligations under this Contract.

1.10 SCHEDULE REVISIONS

- A. Updating the Schedule to reflect actual progress shall not be considered revisions to the Schedule. Since scheduling is a dynamic process, revisions to activity durations and sequences are expected on a monthly basis.
- B. To reflect revisions to the Schedule, the Contractor shall provide District with a written narrative with a full description and reasons for each Work activity revised. For revisions affecting the sequence of work, the Contractor shall provide a schedule diagram which compares the original sequence to the revised sequence of work. The Contractor shall provide the written narrative and schedule diagram for revisions two (2) working days in advance of the monthly schedule update meeting.
- C. Schedule revisions shall not be incorporated into any schedule update until the revisions have been reviewed by District. District may request further information and justification for schedule revisions and Contractor shall, within three (3) days, provide District with a complete written narrative response to District's request.
- D. If the Contractor's revision is still not accepted by District, and the Contractor disagrees with District's position, the Contractor has seven (7) calendar days from receipt of District's letter rejecting the revision to provide a written narrative providing full justification and explanation for the revision. The Contractor's failure to respond in writing within seven (7) calendar days of District's written rejection of a schedule revision shall be contractually interpreted as acceptance of District's position, and the Contractor waives its rights to subsequently dispute or file a claim regarding District's position.
- E. At District's discretion, the Contractor can be required to provide Subcontractor certifications of performance regarding proposed schedule revisions affecting said Subcontractors.

1.11 RECOVERY SCHEDULE

- A. If the Schedule Update shows a completion date twenty-one (21) calendar days beyond the Contract Completion Date, or individual milestone completion dates, the Contractor shall submit to District the proposed revisions to recover the lost time within seven (7) calendar days. As part of this submittal, the Contractor shall provide a written narrative for each revision made to recapture the lost time. If the revisions include sequence changes, the Contractor shall provide a schedule diagram comparing the original sequence to the revised sequence of work.

- B. The revisions shall not be incorporated into any schedule update until the revisions have been reviewed by District.
- C. If the Contractor's revisions are not accepted by District, District and the Contractor shall follow the procedures in paragraph 1.09.C, 1.09.D and 1.09.E above.
- D. At District's discretion, the Contractor can be required to provide Subcontractor certifications for revisions affecting said Subcontractors.

1.12 TIME IMPACT EVALUATION ("TIE") FOR CHANGE ORDERS, AND OTHER DELAYS

- A. When Contractor is directed to proceed with changed Work, the Contractor shall prepare and submit within fourteen (14) calendar days from the Notice to Proceed a TIE which includes both a written narrative and a schedule diagram depicting how the changed Work affects other schedule activities. The schedule diagram shall show how the Contractor proposes to incorporate the changed Work in the schedule and how it impacts the current schedule-update critical path. The Contractor is also responsible for requesting time extensions based on the TIE's impact on the critical path. The diagram must be tied to the main sequence of schedule activities to enable District to evaluate the impact of changed Work to the scheduled critical path.
- B. Contractor shall be required to comply with the requirements of Paragraph 1.09.A for all types of delays such as, but not limited to, Contractor/Subcontractor delays, adverse weather delays, strikes, procurement delays, fabrication delays, etc.
- C. Contractor shall be responsible for all costs associated with the preparation of TIEs, and the process of incorporating them into the current schedule update. The Contractor shall provide District with four (4) copies of each TIE.
- D. Once agreement has been reached on a TIE, the Contract Time will be adjusted accordingly. If agreement is not reached on a TIE, the Contract Time may be extended in an amount District allows, and the Contractor may submit a claim for additional time claimed by contractor.

1.13 TIME EXTENSIONS

- A. The Contractor is responsible for requesting time extensions for time impacts that, in the opinion of the Contractor, impact the critical path of the current schedule update. Notice of time impacts shall be given in accord with the General Conditions.
- B. Where an event for which District is responsible impacts the projected Completion Date, the Contractor shall provide a written mitigation plan, including a schedule diagram, which explains how (e.g., increase crew size, overtime, etc.) the impact can be mitigated. The Contractor shall also include a detailed cost breakdown of the labor, equipment, and material the Contractor would expend to mitigate District-caused time impact. The Contractor shall submit its mitigation plan to District within fourteen (14)

calendar days from the date of discovery of the impact. The Contractor is responsible for the cost to prepare the mitigation plan.

- C. Failure to request time, provide TIE, or provide the required mitigation plan will result in Contractor waiving its right to a time extension and cost to mitigate the delay.
- D. No time will be granted under this Contract for cumulative effect of changes.
- E. District will not be obligated to consider any time extension request unless the Contractor complies with the requirements of Contract Documents.
- F. Failure of the Contractor to perform in accordance with the current schedule update shall not be excused by submittal of time extension requests.
- G. If the Contractor does not submit a TIE within the required fourteen (14) calendar days for any issue, it is mutually agreed that the Contractor does not require a time extension for said issue.

1.14 SCHEDULE REPORTS

- A. Submit four (4) copies of the following reports with the Initial CPM Schedule, the Original CPM Schedule, and each monthly update.
- B. Required Reports:
 - (1) Two activity listing reports: one sorted by activity number and one by total Project Float. These reports shall also include each activity's early/late and actual start and finish dates, original and remaining duration, Project Float, responsibility code, and the logic relationship of activities.
 - (2) Cost report sorted by activity number including each activity's associated cost, percentage of Work accomplished, earned value- to date, previous payments, and amount earned for current update period.
 - (3) Schedule plots presenting time-scaled network diagram showing activities and their relationships with the controlling operations or critical path clearly highlighted.
 - (4) Cash flow report calculated by early start, late start, and indicating actual progress. Provide an exhibit depicting this information in graphic form.
 - (5) Planned versus actual resource (i.e., labor) histogram calculated by early start and late start.
- C. Other Reports:

In addition to above reports, District may request, from month to month, any two of the following reports. Submit four (4) copies of all reports.

- (1) Activities by early start.
 - (2) Activities by late start.
 - (3) Activities grouped by Subcontractors or selected trades.
 - (4) Activities with scheduled early start dates in a given time frame, such as fifteen (15) or thirty (30) day outlook.
- D. Furnish District with report files on compact disks containing all schedule files for each report generated.

1.15 PROJECT STATUS REPORTING

- A. In addition to submittal requirements for CPM scheduling identified in this Section, Contractor shall provide a monthly project status report (i.e., written narrative report) to be submitted in conjunction with each CPM Schedule as specified herein. Status reporting shall be in form specified below.
- B. Contractor shall prepare monthly written narrative reports of status of Project for submission to District. Written status reports shall include:
- (1) Status of major Project components (percent (%) complete, amount of time ahead or behind schedule) and an explanation of how Project will be brought back on schedule if delays have occurred.
 - (2) Progress made on critical activities indicated on CPM Schedule.
 - (3) Explanations for any lack of work on critical path activities planned to be performed during last month.
 - (4) Explanations for any schedule changes, including changes to logic or to activity durations.
 - (5) List of critical activities scheduled to be performed next month.
 - (6) Status of major material and equipment procurement.
 - (7) Any delays encountered during reporting period.
 - (8) Contractor shall provide printed report indicating actual versus planned resource loading for each trade and each activity. This report shall be provided on weekly and monthly basis.
 - (a) Actual resource shall be accumulated in field by Contractor, and shall be as noted on Contractor's daily reports. These reports will be basis for information provided in computer-generated monthly and weekly printed reports.
 - (b) Contractor shall explain all variances and mitigation measures.

- (9) Contractor may include any other information pertinent to status of Project. Contractor shall include additional status information requested by District at no additional cost.
- (10) Status reports, and the information contained therein, shall not be construed as claims, notice of claims, notice of delay, or requests for changes or compensation.

1.16 WEEKLY SCHEDULE REPORT

At the Weekly Progress Meeting, the Contractor shall provide and present a time-scaled three (3) week look-ahead schedule that is based and correlated by activity number to the current schedule (i.e., Initial, Original CPM, or Schedule Update).

1.17 DAILY CONSTRUCTION REPORTS

On a daily basis, Contractor shall submit a daily activity report to District for each workday, including weekends and holidays when worked. Contractor shall develop the daily construction reports on a computer-generated database capable of sorting daily Work, manpower, and man-hours by Contractor, Subcontractor, area, sub-area, and Change Order Work. Upon request of District, furnish computer disk of this data base. Obtain District's written approval of daily construction report data base format prior to implementation. Include in report:

- A. Project name and Project number.
- B. Contractor's name and address.
- C. Weather, temperature, and any unusual site conditions.
- D. Brief description and location of the day's scheduled activities and any special problems and accidents, including Work of Subcontractors. Descriptions shall be referenced to CPM scheduled activities.
- E. Worker quantities for its own Work force and for Subcontractors of any tier.
- F. Equipment, other than hand tools, utilized by Contractor and Subcontractors.

1.18 PERIODIC VERIFIED REPORTS

Contractor shall complete and verify construction reports on a form prescribed by the Division of the State Architect and file reports on the first day of February, May, August, and November during the preceding quarter year; at the completion of the Contract; at the completion of the Work; at the suspension of Work for a period of more than one (1) month; whenever the services of Contractor or any of Contractor's Subcontractors are terminated for any reason; and at any time a special verified report is required by the Division of the State Architect. Refer to section 4-336 and section 4-343 of Part 1, Title 24 of the California Code of Regulations.

PART 2 – PRODUCTS Not Used.

PART 3 - EXECUTION Not Used.

END OF DOCUMENT

SUBMITTALS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Contractor's Submittals and Schedules, Drawings and Specifications;
- B. Special Conditions.

1.02 SECTION INCLUDES:

- A. Definitions:
 - (1) Shop Drawings and Product Data are as indicated in the General Conditions and include, but are not limited to, fabrication, erection, layout and setting drawings, formwork and falsework drawings, manufacturers' standard drawings, descriptive literature, catalogues, brochures, performance and test data, wiring and control diagrams. In addition, there are other drawings and descriptive data pertaining to materials, equipment, piping, duct and conduit systems, and methods of construction as may be required to show that the materials, equipment or systems and all positions conform to the requirement of the Contract Documents, including, without limitation, the Drawings.
 - (2) "Manufactured" applies to standard units usually mass-produced; "fabricated" means specifically assembled or made out of selected materials to meet design requirements. Shop Drawings shall establish the actual detail of manufactured or fabricated items, indicated proper relation to adjoining work and amplify design details of mechanical and electrical equipment in proper relation to physical spaces in the structure.
 - (3) Manufacturer's Instructions: Where any item of Work is required by the Contract Documents to be furnished, installed, or performed, at a minimum, in accordance with a specified product manufacturer's instructions, the Contractor shall procure and distribute copies of these to the District, the Architect, and all other concerned parties and shall furnish, install, or perform the work, at a minimum, in accordance with those instructions.
- B. Samples, Shop Drawings, Product Data, and other items as specified, in accordance with the following requirements:
 - (1) Contractor shall submit all Shop Drawings, Product Data, and Samples to the District, the Architect, the Project Inspector, and the Construction Manager.

Contractor to review section
01 3300 as well as this
document

- (2) Contractor shall comply with all time frames herein and in the General Conditions and, in any case, shall submit required information in sufficient time to permit proper consideration and action before ordering any materials or items represented by such Shop Drawings, Product Data, and/or Samples.
- (3) Contractor shall allow sufficient time so that no delay occurs due to required lead time in ordering or delivery of any item to the Site. Contractor shall be responsible for any delay in progress of Work due to its failure to observe these requirements.
- (4) Time for completion of Work shall not be extended on account of Contractor's failure to promptly submit Shop Drawings, Product Data, and/or Samples.
- (5) Reference numbers on Shop Drawings shall have Architectural and/or Engineering Contract Drawings reference numbers for details, sections, and "cuts" shown on Shop Drawings. These reference numbers shall be in addition to any numbering system that Contractor chooses to use or has adopted as standard.
- (6) When the magnitude or complexity of submittal material prevents a complete review within the stated time frame, Contractor shall make this submittal in increments to avoid extended delays.
- (7) Contractor shall certify on submittals for review that submittals conform to Contract requirements. Also certify that Contractor-furnished equipment can be installed in allocated space. In event of any variance, Contractor shall specifically state in transmittal and on Shop Drawings, portions vary and require approval of a substitute. Submittals shall not be used as a means of requesting a substitution.
- (8) Unless specified otherwise, sampling, preparation of samples, and tests shall be in accordance with the latest standard of the American Society for Testing and Materials.
- (9) Upon demand by Architect or District, Contractor shall submit samples of materials and/or articles for tests or examinations and consideration before Contractor incorporates same in Work. Contractor shall be solely responsible for delays due to sample(s) not being submitted in time to allow for tests. Acceptance or rejection will be expressed in writing. Work shall be equal to approved samples in every respect. Samples that are of value after testing will remain the property of Contractor.

C. Submittal Schedule:

- (1) Contractor shall prepare its proposed submittal schedule that is coordinated with the proposed construction schedule and submit both to the District within ten (10) days after the date of the Notice to Proceed. Contractor's proposed schedules shall become the Project Construction Schedule and the Project Submittal Schedule after each is approved by the District.

Contractor to review section
01 3300 as well as this
document

- (2) Contractor is responsible for all lost time should the initial submittal be rejected, marked "revise and resubmit", etc.
- (3) All Submittals shall be forwarded to the District by the date indicated on the approved Submittal Schedule, unless an earlier date is necessary to maintain the Construction Schedule, in which case those Submittals shall be forwarded to the District so as not to delay the Construction Schedule.
- (4) Contractor may be assessed \$100 a day for each day it is late in submitting a shop drawing or sample. No extensions of time will be granted to Trade Contractor or any Subcontractor because of its failure to have shop drawings and samples submitted in accordance with the Schedule.

1.03 SHOP DRAWINGS:

- A. Contractor shall submit one reproducible transparency and six (6) opaque reproductions. The District will review and return the reproducible copy and one (1) opaque reproduction to Contractor.
- B. Before commencing installation of any Work, the Contractor shall submit and receive approval of all drawings, descriptive data, and material list(s) as required to accomplish Work.
- C. Review of Shop Drawings is regarded as a service to assist Contractor and in all cases original Contract Documents shall take precedence as outlined under General Conditions.
- D. No claim for extra time or payment shall be based on work shown on Shop Drawings unless the claim is (1) noted on Contractor's transmittal letter accompanying Shop Drawings and (2) Contractor has complied with all applicable provisions of the General Conditions, including, without limitation, provisions regarding changes and payment, and all required written approvals.
- E. District shall not review Shop Drawings for quantities of materials or number of items supplied.
- F. District's and/or Architect's review of Shop Drawing will be general. District and/or Architect review does not relieve Contractor of responsibility for dimensions, accuracy, proper fitting, construction of Work, furnishing of materials, or Work required by Contract Documents and not indicated on Shop Drawings. The District's and/or Architect's review of Shop Drawings is not to be construed as approving departures from Contract Documents.
- G. Review of Shop Drawings and Schedules does not relieve Contractor from responsibility for any aspect of those Drawings or Schedules that is a violation of local, County, State, or Federal laws, rules, ordinances, or rules and regulations of commissions, boards, or other authorities or utilities having jurisdiction.
- H. Before submitting Shop Drawings for review, Contractor shall check Shop Drawings of its subcontractors for accuracy, and confirm that all Work

Contractor to review section
01 3300 as well as this
document

contiguous with and having bearing on other work shown on Shop Drawings is accurately drawn and in conformance with Contract Documents.

- I. Submitted drawings and details must bear stamp of approval of Contractor:
 - (1) Stamp and signature shall clearly certify that Contractor has checked Shop Drawings for compliance with Drawings.
 - (2) If Contractor submits a Shop Drawing without an executed stamp of approval, or whenever it is evident (despite stamp) that Drawings have not been checked, the District and/or Architect will not consider them and will return them to the Contractor for revision and resubmission. In that event, it will be deemed that Contractor has not complied with this provision and Contractor shall bear risk of all delays to same extent as if it had not submitted any Shop Drawings or details.
- J. Submission of Shop Drawings (in either original submission or when resubmitted with correction) constitutes evidence that Contractor has checked all information thereon and that it accepts and is willing to perform Work as shown.
- K. Contractor shall pay for cost of any changes in construction due to improper checking and coordination. Contractor shall be responsible for all additional costs, including coordination. Contractor shall be responsible for costs incurred by itself, the District, the Architect, the Project Inspector, the Construction Manager, any other Subcontractor or contractor, etc., due to improperly checked and/or coordination of submittals.
- L. Shop Drawings must clearly delineate the following information:
 - (1) Project name and address.
 - (2) Specification number and description.
 - (3) Architect's name and project number.
 - (4) Shop Drawing title, number, date, and scale.
 - (5) Names of Contractor, Subcontractor(s) and fabricator.
 - (6) Working and erection dimensions.
 - (7) Arrangements and sectional views.
 - (8) Necessary details, including complete information for making connections with other Work.
 - (9) Kinds of materials and finishes.
 - (10) Descriptive names of materials and equipment, classified item numbers, and locations at which materials or equipment are to be installed in the Work. Contractor shall use same reference identification(s) as shown on Contract Drawings.

Contractor to review section
01 3300 as well as this
document

- M. Contractor shall prepare composite drawings and installation layouts when required to solve tight field conditions.
 - (1) Shop Drawings shall consist of dimensioned plans and elevations and must give complete information, particularly as to size and location of sleeves, inserts, attachments, openings, conduits, ducts, boxes, structural interferences, etc.
 - (2) Contractor shall coordinate these composite Shop Drawings and installation layouts in the field between itself and its Subcontractor(s) for proper relationship to the Work, the work of other trades, and the field conditions. The Contractor shall check and approve all submittal(s) before submitting them for final review.

1.04 PRODUCT DATA OR NON REPRODUCIBLE SUBMITTALS:

- A. Contractor shall submit manufacturer's printed literature in original form. Any fading type of reproduction will not be accepted. Contractor must submit a minimum of six (6) each, to the District. District shall return one (1) to the Contractor, who shall reproduce whatever additional copies it requires for distribution.
- B. Contractor shall submit six (6) copies of a complete list of all major items of mechanical, plumbing, and electrical equipment and materials in accordance with the approved Submittal Schedule, except as required earlier to comply with the approved Construction Schedule. Other items specified are to be submitted prior to commencing Work. Contractor shall submit items of like kind at one time in a neat and orderly manner. Partial lists will not be acceptable.
- C. Submittals shall include manufacturer's specifications, physical dimensions, and ratings of all equipment. Contractor shall furnish performance curves for all pumps and fans. Where printed literature describes items in addition to that item being submitted, submitted item shall be clearly marked on sheet and superfluous information shall be crossed out. If highlighting is used, Contractor shall mark all copies.
- D. Equipment submittals shall be complete and include space requirements, weight, electrical and mechanical requirements, performance data, and supplemental information that may be requested.
- E. Imported Materials Certification must be submitted at least ten (10) days before material is delivered.

1.05 SAMPLES:

- A. Contractor shall submit for approval Samples as required and within the time frame in the Contract Documents. Materials such as concrete, mortar, etc., which require on-site testing will be obtained from Project Site.
- B. Contractor shall submit four (4) samples except where greater or lesser number is specifically required by Contract Documents including, without limitation, the Specifications.

Contractor to review section
01 3300 as well as this
document

- (1) Samples must be of sufficient size and quality to clearly illustrate functional characteristics, with integrally related parts and attachment devices.
 - (2) Samples must show full range of texture, color, and pattern.
- C. Contractor shall make all Submittals, unless it has authorized Subcontractor(s) to submit and Contractor has notified the District in writing to this effect.
- D. Samples to be shipped prepaid or hand-delivered to the District.
- E. Contractor shall mark samples to show name of Project, name of Contractor submitting, Contract number and segment of Work where representative Sample will be used, all applicable Specifications Sections and documents, Contract Drawing Number and detail, and ASTM or FS reference, if applicable.
- F. Contractor shall not deliver any material to Site prior to receipt of District's and/or Architect's completed written review and approval. Contractor shall furnish materials equal in every respect to approved Samples and execute Work in conformance therewith.
- G. District's and/or Architect's review, acceptance, and/or approval of Sample(s) will not preclude rejections of any material upon discovery of defects in same prior to final acceptance of completed Work.
- H. After a material has been approved, no change in brand or make will be permitted.
- I. Contractor shall prepare its Submittal Schedule and submit Samples of materials requiring laboratory tests to specified laboratory for testing not less than ninety (90) days before such materials are required to be used in Work.
- J. Samples which are rejected must be resubmitted promptly after notification of rejection and be marked "Resubmitted Sample" in addition to other information required.
- K. Field Samples and Mock-Ups are to be removed by Contractor at District's direction:
 - (1) Size: As Specified.
 - (2) Furnish catalog numbers and similar data, as requested.

1.06 REVIEW AND RESUBMISSION REQUIREMENTS:

- A. The District will arrange for review of Sample(s), Shop Drawing(s), Product Data, and other submittal(s) by appropriate reviewer and return to Contractor as provided below within twenty-one (21) days after receipt or within twenty-one (21) days after receipt of all related information necessary for such review, whichever is later.
- B. One (1) copy of product or materials data will be returned to Contractor with the review status.

Contractor to review section
01 3300 as well as this
document

- C. Samples to be incorporated into the Work will be returned to Contractor, together with a written notice designating the Sample with the appropriate review status and indicating errors discovered on review, if any. Other Samples will not be returned, but the same notice will be given with respect thereto, and that notice shall be considered a return of the Sample.
- D. Contractor shall revise and resubmit any Sample(s), Shop Drawing(s), Product Data, and other submittal(s) as required by the reviewer. Such resubmittals will be reviewed and returned in the same manner as original Sample(s), Shop Drawing(s), Product Data, and other submittal(s), within fourteen (14) days after receipt thereof or within fourteen (14) days after receipt of all related information necessary for such review. Such resubmittal shall not delay the Work.
- E. Contractor may proceed with any of the Work covered by Sample(s), Shop Drawing(s), Product Data, and other submittal(s) upon its return if designated as no exception taken, or revise as noted, provided the Contractor proceeds in accordance with the District and/or the Architect's notes and comments.
- F. Contractor shall not begin any of the work covered by a Sample(s), Shop Drawing(s), Product Data, and other submittal(s), designated as revise and resubmit or rejected, until a revision or correction thereof has been reviewed and returned to Contractor.
- G. Sample(s), Shop Drawing(s), Product Data, and other submittal(s) designated as revise and resubmit or rejected and requiring resubmittal, shall be revised or corrected and resubmitted to the District no later than fourteen (14) days or a shorter period as required to comply with the approved Construction Schedule, after its return to Contractor.
- H. Neither the review nor the lack of review of any Sample(s), Shop Drawing(s), Product Data, and other submittal(s) shall waive any of the requirements of the Contract Documents, or relieve Contractor of any obligation thereunder.
- I. District's and/or Architect's review of Shop Drawings does not relieve the Contractor of responsibility for any errors that may exist. Contractor is responsible for the dimensions and design of adequate connections and details and for satisfactory construction of all the Work.

PART 2 – PRODUCTS Not Used.

PART 3 - EXECUTION Not Used.

END OF DOCUMENT

Project Name
District/Owner

SUBMITTAL NO.:

Architect's Project # XX-XXXX

DATE: _____

DSA File/Apl. # XX-XX/XX-XXXXXX

Re-Submittal of Original No.: _____

1. SUBMITTAL TRANSMITTAL

Attention: Project Contact

Contractor: Company

Contact: Name _____

Sub Contractor:

Contact: _____

HMC
Architects

Please submit only one trade per submittal! Description of submitted materials:

Quantity submitted	Specification Section		Description of contents (e.g. product data, shop drawings, samples)
	Section #	Section Title	

Contractor Statement: (read and acknowledge)

This submittal has been reviewed and approved with respect to the means, methods, techniques, and procedures of construction, safety precautions, and program incidentals thereto. This submittal complies with the contract documents and comprises no variations thereto, unless accompanied by a substitution request.

By: _____
Name

Date: _____

2. RE-TRANSMITTAL TO CONTRACTOR:

Distribution: Contractor, Owner, Project Inspector, RGA, Other

- ☐ NO EXCEPTIONS TAKEN
☐ SUBMIT SPECIFIED ITEM

- ☐ REJECTED
☐ REVISE AND RESUBMIT

- ☐ FURNISH AS CORRECTED
☐ NO ACTION REQUIRED

Corrections or comments made on the shop drawings during this review do not relieve the Contractor from compliance with requirements of the Drawings and Specifications. This general check is only for the review of conformance with the design concept of the project and general compliance with the information given in the Contract Documents. The Contractor is responsible for confirming and correlating all quantities and dimensions, selecting fabrication processes and techniques of construction, coordinating his work with that of all the other trades, and performing his work in a safe and satisfactory manner.

HMC ARCHITECTS

By: _____ Date: _____

Additional Comments:

See Specification Section 01 3300 for use of this form

Project Name
District/Owner

**SUBSTITUTION
REQUEST NO.:**

Architect's Project # XX-XXXX
DSA File/Apl. # XX-XX/XX-XXXXXX

Date: _____

1. SUBSTITUTION REQUEST

Attention: Project Contact

HMC
Architects

Contractor: Company

Contact: Name

Please submit only one product per request!

Sub Contractor:

Include with a specified product Submittal

Contact: _____

2. PROPOSED SUBSTITUTIONS: The undersigned requests consideration of the following substitution:

Specified Item: _____ Page No.: _____ Paragraph No.: _____

Proposed Item: _____

3. REASON FOR REQUEST:

4. REQUIREMENTS FOR SUBSTITUTIONS:

Attached data includes product description, specifications, drawings, photographs, performance and test data adequate for evaluation of request; applicable portions of data are clearly identified. Attached data also includes a description of changes to Contract Documents, which proposed substitution will require for its proper installation.

The undersigned certifies that the following paragraphs, unless modified by attachments, are correct:

1. The proposed substitution does not affect dimensions shown on drawings and does not require design changes in the Contract Documents.
2. The undersigned will pay for changes to the building design, including engineering design, detailing and construction costs caused by the requested substitution.
3. The proposed substitution will have no adverse effect on the work, the schedule or specified warranty requirements.
4. Maintenance and service parts will be readily available for the proposed substitution.

The undersigned further states that the function, appearance and quality of the proposed substitution are equivalent or superior to the specified item.

Signature - Contractor/Subcontractor

Date

5. TRANSMITTAL TO CONTRACTOR:

Distribution: Contractor, Owner, Project Inspector, RGA, Other

☐ ACCEPTED

☐ ACCEPTED AS NOTED

☐ REJECTED

HMC ARCHITECTS

By: _____

Date: _____

Comments:

Project Name
District/Owner

RFI NO.:

Architect's Project # XX-XXXX
DSA File/Apl. # XX-XX/XX-XXXXXX

Date: _____

1. REQUEST FOR INFORMATION

Attention: Project Contact

From:

Contractor:

Company

Contact:

Name

Sub Contractor:

Contact:

HMC
Architects

Identify related specific references within the Contract Documents and supporting information:

Dwg./Document No.: _____

Building/Site Location: _____

2. Existing Condition (source / reason for the request):

3. Recommended Contractor Action(s) for resolution:

4. Project Inspector Acknowledgment:

Date Reviewed: _____

5. Owner / A/E Resolution(s):

Date of Response: _____ By: _____

Attachments: _____

Extra Work Involved in the Above Described Change?

Yes ☐

No ☐

Distribution: Contractor, Owner, Project Inspector, HMC, Other
See Specification Section 01300 for use of this form

HMC, Other

Project Name
District/Owner

**E-DATA
REQUEST NO.:**

Architect's Project # XX-XXXX
DSA File/Appl. # XX-XX/XX-XXXXXX

Date: _____

1. ELECTRONIC DATA REQUEST

Attention: Project Contact

From: Contractor: Company

Contact: Name

HMC
Architects

Sub Contractor:

Contact: _____

2. DATA REQUESTED - Provide list of specific drawings requested (include sheet numbers):

3. REASON FOR REQUEST - Provide clear explanation of why information is desired and for what purpose it will be utilized:

4. ACKNOWLEDGEMENT OF RESPONSIBILITY:

The electronic data files requested are distributed for reference only. Transferring such files can alter, delete or change original information. Accuracy of the data cannot be guaranteed as correct or complete and the Contractor accepts full responsibility for any and all inaccuracies, regardless of cause.

The hard copy documents, including addenda and subsequent written changes to the documents, represent the complete work of the contract and all electronic files should be cross-referenced and verified from that information as electronic files may not contain all contract information. It is the Contractor's responsibility to make any changes or revisions necessary.

This electronic data is furnished without guarantee of compatibility with your hardware or software. It is the Contractor's responsibility to notify the Architect in the event a compatibility problem or disk defect is encountered and a replacement disk is necessary.

This electronic data, in its present form, remains the property of HMC Architects and shall not be used for any other purpose than to provide background information for the project noted above. It is not to be released to any other party without the written consent of HMC Architects.

Accepted by: _____
Signature - Contractor/Subcontractor

Representing: _____
Contractor/Subcontractor Company Name

MEGGER GROUNDING TEST CERTIFICATE

This certifies that a Megger Grounding Test for the _____ **[name of project]** _____ for the _____ **[name of District]** _____ School District, of _____ **[name of county]** _____ County, California was conducted on the _____ day of _____, **[year]**, per CCR Title 24, Sections 200 H and J. The undersigned verifies that the resistance to ground was 25 ohms or less, as required, and is found to be acceptable.

Project Name: _____

DSA File No.: _____ DSA Application No.: _____

Address: _____

General Contractor's Signature: _____

Electrical Contractor's Signature: _____

Testing Agency's Signature: _____

District Inspector's Signature: _____

SEPARATE CERTIFICATE IS REQUIRED FOR EACH SITE

CERTIFICATION OF CHLORINATION AND STERILIZATION

This certifies that _____ chlorinated the domestic hot and cold water plumbing lines for the **[name of project]**, **[name of district]** School District. The lines were first flushed and chlorine was injected in the main water line on _____, **[year]**. A minimum chlorine residual of 50 ppm was measured at each outlet. The lines were tagged, secured and the make-up water was shut off. On _____, **[year]**, (a minimum of 24 hours later) the chlorine residual was retested and found to contain a minimum of 50 ppm. The plumbing lines were then thoroughly flushed with fresh water until the chlorine residual was not greater than 0.2 ppm at all outlets. A Bacteriological Examination report has been provided.

District Inspector Signature: _____

Date _____

Name of Chlorination and Testing Firm: _____

Authorized Representative Signature: _____

Date _____

Name of General Contractor: _____

Authorized Representative Signature: _____

Date _____

CERTIFICATION OF COMPLIANCE FOR BUILDING MATERIALS

This is to certify, in accordance with the Environmental Protection Agency requirements, that the materials and equipment used in the construction of the [project name] for the [district name] School District of [name of county] County, California, are asbestos free and are, therefore, not subject to monitoring for asbestos contamination.

Project Name: _____

Address: _____

Contractor: _____

Address: _____

Signature: _____

Title: _____

Date: _____

SEPARATE CERTIFICATE IS REQUIRED FOR EACH SITE

ROOFING CERTIFICATION

This is to certify that a representative of the manufacturer has visited the site prior to installation, inspected the surfaces which the roofing is applied and accepted those surfaces.

In addition, a representative of the manufacturer has inspected the materials and methods used, verified they are in accordance with the manufacturer's recommendations, and accepts the final installation.

A guarantee for materials and workmanship is to be provided separately.

Project name: _____

Address: _____

General Contractor: _____

Roofing Contractor: _____

Scope of Work/Roofing Type: _____

Roofing Manufacturer: _____

Manufacturer's Representative: _____

Representative's Signature: _____

Date: _____

A SEPARATE CERTIFICATE IS REQUIRED FOR EACH SITE
AND FOR EACH ROOFING TYPE

SITE STANDARDS

PART 1 – GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including without limitation, Site Access, Conditions, and Regulations;
- B. Special Conditions;
- C. Drug-Free Workplace Certification;
- D. Tobacco-Free Environment Certification;
- E. Criminal Background Investigation/Fingerprinting Certification;
- F. Temporary Facilities and Controls.

1.02 REQUIREMENTS OF THE DISTRICT:

- A. Drug-Free Schools and Safety Requirements:
 - (1) All school sites and other District Facilities have been declared "Drug-Free Zones." No drugs, alcohol and/or smoking are allowed at any time in any buildings and/or grounds on District property. No students, staff, visitors, or contractors are to use drugs on these sites.
 - (2) Smoking and the use of tobacco products by all persons is prohibited on or in District property. District property includes school buildings, school grounds, school-owned vehicles and vehicles owned by others while on District property. Contractor shall post: "Non-Smoking Area" in a highly visible location in each work area, staging area, and parking area. Contractor may designate a smoking area outside of District property within the public right-of-way, provided that this area remains quiet and unobtrusive to adjacent neighbors. This smoking area is to be kept clean at all times.
 - (3) Contractor shall ensure that no alcohol, firearms, weapons, or controlled substances enter or are used at the Site. Contractor shall immediately remove from the Site and terminate the employment of any employee(s) found in violation of this provision.
- B. Language: Profanity or other unacceptable and/or loud language will not be tolerated, "Cat calls" or other derogatory language toward students, staff, volunteers, parents or public will not be allowed.

C. Disturbing the Peace (Noise and Lighting):

- (1) Contractor shall observe the noise ordinance of the Site at all times including, without limitation, all applicable local, city, and/or state laws, ordinances, and/or regulations regarding noise and allowable noise levels.
- (2) The use of radios, etc., shall be controlled to keep all sound at a level that cannot be heard beyond the immediate area of use. District reserves the right to prohibit the use of radios at the Site, except for mobile phones or other handheld communication radios.
- (3) If portable lights are used after dark, all light must be located so as not to direct light into neighboring property.

D. Traffic:

- (1) Driving on the Premises shall be limited to periods when students and public are not present. If driving or deliveries must be made during the school hours, two (2) or more ground guides shall lead the vehicle across the area of travel. In no case shall driving take place across playgrounds or other pedestrian paths during recess, lunch, and/or class period changes. The speed limit on-the Premises shall be five (5) miles per hour (maximum) or less if conditions require.
- (2) All paths of travel for deliveries, including without limitation, material, equipment, and supply deliveries, shall be reviewed and approved by District in advance. Any damage will be repaired to the pre-damaged condition by the Contractor.
- (3) District shall designate a construction entry to the Site. If Contractor requests, District determines it is required, and to the extent possible, District shall designate a staging area so as not to interfere with the normal functioning of school facilities. Location of gates and fencing shall be approved in advance with District and at Contractor's expense.
- (4) Parking areas shall be reviewed and approved by District in advance. No parking is to occur under the drip line of trees or in softscape areas that could otherwise be damaged.

- E. All of the above shall be observed and complied with by the Contractor and all workers on the Site. Failure to follow these directives could result in individual(s) being suspended or removed from the work force at the discretion of the District. The same rules and regulations shall apply equally to delivery personnel, inspectors, consultants, and other visitors to the Site.

PART 2 - PRODUCTS Not Used.

PART 3 - EXECUTION Not Used.

END OF DOCUMENT

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Alteration requirements for modernizations, remodels, and additions.

1.2 RELATED REQUIREMENTS

- A. Section 01 1100, Summary of Work.
- B. Section 01 5000, Temporary Facilities and Controls.
- C. Section 01 7329, Cutting and Patching.

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CALGreen), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Coordination:
 - 1. Contractor to coordinate and conduct a meeting with the demolition contractor to verify which systems, if any, are to be protected and maintained. Such systems shall be clearly identified and marked to avoid unnecessary damage or removal.
 - 2. Coordinate work of alterations and renovations to expedite completion sequentially and to accommodate Owner occupancy.

1.5 QUALITY ASSURANCE

- A. Manufacturer and Installer Qualifications: As specified in the product specifications.
- B. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.
- C. Single Source Responsibility: Use materials and products of one manufacturer whenever possible.
- D. All materials, components, assemblies, workmanship and installation are to be observed by the Owner's Inspector of Record. Work not so inspected is subject to uncovering and replacement.

ALTERATION PROJECT PROCEDURES
SECTION 01 3516
3595001

1.6 FIELD CONDITIONS

- A. Make and be responsible for all field dimensions necessary for proper fitting and completion of work. Report discrepancies to Architect before proceeding.

PART 2 - PRODUCTS

2.1 PRODUCTS FOR PATCHING AND EXTENDING WORK

- A. New Materials: As specified in product Sections; match existing products and work for patching and extending work.
- B. Type and Quality of Existing Products: Determine by inspection and testing products where necessary, referring to existing work as a standard.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that demolition is complete and areas are ready for installation of new work.
- B. Inspect conditions of uncovered work affecting installation of products or performance work.
- C. Verify that specified items may be installed in accordance with the approved design.
- D. Beginning of restoration work means acceptance of existing conditions.
- E. In event of discrepancy, immediately notify Architect. Do not proceed in discrepant areas until discrepancies have been fully resolved.

3.2 PREPARATION

- A. Close openings in exterior surfaces to protect existing work and salvage items for weather and extremes of temperature and humidity. Insulate ductwork and piping to prevent condensation in exposed areas.
- B. Cut, move or remove items as necessary for access to alterations and renovation work.
- C. Remove debris and abandoned items from area and from concealed spaces.
- D. Remove unsuitable material not marked for salvage, such as rotted wood, corroded metals, and deteriorated masonry and concrete.
- E. Prepare surface, and remove surface finishes to provide for proper installation of new work and finishes including blocking, framing, insulation, etc.
- F. Replace materials as specified for finished work.

3.3 INSTALLATION

- A. Complete Project in all respects.
- B. Remove, cut and patch work in a manner to minimize damage and to provide a means of restoring products and finishes to original condition, and installation of concealed work, as specified in Section 01 7329, Cutting and Patching,
- C. Install products as specified in individual specifications Sections.
- D. Where materials or equipment are removed, but no new finish is scheduled, patch and repair any damage to match existing wall surface.

3.4 TRANSITIONS

- A. Where new work abuts or aligns with existing, perform a smooth and even transition. Patched work is to match existing adjacent work in texture and appearance.
- B. When finished surfaces are cut so that a smooth transition with new work is not possible, terminate existing surface along a straight line at a natural point of division and make recommendation to Architect.

3.5 ADJUSTMENTS

- A. Where removal of partitions or walls results in adjacent spaces becoming one, rework floors, walls and ceilings to a smooth plane without breaks, steps or bulkheads.
- B. Where a change of plane of 1/8" or more occurs, submit recommendation for providing a smooth transition for Architect review.
- C. Fit work at penetrations of surfaces as specified in Section 01 7329.

3.6 FINISHES

- A. Finish surfaces as specified in individual Product Sections.
- B. Finish patches to produce uniform finish and texture over entire area. When finish cannot be matched, refinish entire surface to nearest intersections.

3.7 REPAIR OF DAMAGED SURFACES

- A. Patch or replace portions of existing surfaces which are damaged, lifted, discolored, or showing other imperfections.
- B. Repair substrate prior to patching finish.
- C. In the event of damage, make all repairs and replacements necessary to the approval of the Architect at no additional cost to the Owner.

ALTERATION PROJECT PROCEDURES
SECTION 01 3516
3595001

3.8 CLEANING

- A. Upon completion of installation, remove manufacturer's temporary labels and marks of identification. Thoroughly clean surfaces and remove foreign material. Leave entire work in neat, orderly, clean and acceptable condition.

3.9 PROTECTION

- A. Protect work and materials of this Section prior to and during installation, and protect the installed work and materials of other trades.
- B. Exposed finishes shall be free from scratches, dents, permanent discolorations and other defects in workmanship or material.

END OF SECTION

*p:\sacramento\3595 tracy unified school district\001-000_villalovoz es new shade structures\08 specifications\06 spec\04 final\freiler
- shade struct\01 3516 _alteration project procedures.docx
Last Updated: December 16, 2021*

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Special environmental, sustainable, and “green” building practices related to indoor air quality, resource efficiency supplementing the Pollutant Control requirements specified under Section 01 8113.10, Sustainable Design Requirements, and to ensure healthy indoor air quality in final Project.
- B. Contractor is required to comply with sustainable building practices during construction and when considering materials for substitutions. Refer to Article “Design Requirements.”

1.2 RELATED REQUIREMENTS

- A. Section 01 6116, Volatile Organic Compound (VOC) Restrictions.
- B. Section 01 7419, Construction Waste Management and Disposal.
- C. Section 01 8113, Sustainable Design Requirements.

1.3 ADMINISTRATIVE REQUIREMENTS

- A. Submittal Procedures:
 - 1. Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
 - 2. Sustainable Design Submittals shall comply with the additional requirement of Section 01 8113, Sustainable Design Requirements.
 - 3. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.

1.4 DESIGN REQUIREMENTS

- A. Owner has established general environmental goals for design and for construction of the Project.
 - 1. In addition to the Contractor, the Contractor’s construction team, including subcontractors, suppliers, and manufacturers, are encouraged to participate where possible to realize the Owner’s environmental goals.
 - 2. Intent is for environmental goals to be achieved in a manner which ultimately provides a safe and healthy environment for building occupants with minimal impact on the local, regional and global environment.
- B. Environmental Goals:
 - 1. Refer to specific Specifications Sections for more detailed construction requirements related to specific materials and systems.

ENVIRONMENTAL PROCEDURES
SECTION 01 3543
3595001

1.5 INFORMATIONAL SUBMITTALS

A. Indoor Air Quality (IAQ) Data:

1. Environmental Issues: Submit emission test data produced by acceptable testing laboratory, listed in this Specification Article "Quality Assurance," for materials as required in each specific Specification Section.
 - a. Laboratory reports shall contain emissions test data on Volatile Organic Compounds (VOCs) including Total Volatile Organic Compounds (TVOC), specific individual VOCs, formaldehyde and other aldehydes as described in this Section.
 - b. Identify VOCs emitted by each material as required in these Specifications, and demonstrate compliance with the California Green Building Standards Code, edition current as of the date of this Contract.
 - c. Specific test conditions and requirements are set forth in the Specifications. For required tests, submit documentation of sample acquisition, handling, and test specimen preparation, as well as test conditions, methods, and procedures. The tests consist of a 10-day conditioning period followed by a 96-hour test period.
 - 1) Samples collected during the test period at 24, 48, and 96-hours shall be analyzed for TVOC and formaldehyde.
 - 2) VOC samples collected at 96 hours shall be identified and quantified for compounds that are found on the list of Chemicals of Concern. The Chemicals of Concern list is based on the California OEHHA list as of September 2002 (The most recent list shall be used for this Specification as published at:
 - a) http://www.oehha.org/air/chronic_rels/allChrels.html.
2. Cleaning and Maintenance Products: Provide data on manufacturers' recommended maintenance, cleaning, refinishing and disposal procedures for materials and products. These procedures are for final Contractor cleaning of the project prior to Substantial Completion and for provided materials and products as required by the specific Specification Sections.
 - a. Where chemical products are recommended for these procedures, provide documentation to indicate that no component present in the cleaning product at more than 1 percent of the total mass of the cleaning product is a carcinogen or reproductive toxicant as identified in the Chemicals of Concern list referenced above.
 - b. Avoid cleaning products containing alpha-pinene, d-limonene or other unsaturated carbon double bond alkenes due to chemical reactions with ozone to form aldehydes, acidic aerosols, and ultra-fine particulate matter in indoor air.

B. Certificates:

1. Prior to Final Completion, submit a certificate signed by corporate office holder of Contractor, subcontractor, supplier, vendor, installer or manufacturer primarily responsible for the manufacturing of the product, indicating materials provided are

essentially the same, and contain essentially the same components as products and materials tested.

2. Comply with requirements specified in Specification Section 01 7700, Closeout Procedures.

1.6 CLOSEOUT SUBMITTALS

- A. Submit data relating to Environmental Issues.
 1. Submit environmental product certifications, in two forms:
 - a. Two CD-ROMs organized by CSI Division Format.
 - b. Three three-ring binders organized by CSI Division Format with Table of Contents and with dividers for each Division.

1.7 QUALITY ASSURANCE

- A. Environmental Project Management and Coordination: Contractor to identify one person on Contractor's staff to be responsible for environmental issues compliance and coordination.
 1. Experience: Environmental project manager shall have experience relating to sustainable building construction.
 2. Responsibilities: Carefully review the Contract Documents for environmental issues, coordinate work of trades, subcontractors, and suppliers; instruct workers relating to environmental issues; and oversee Project Environmental Goals.
 3. Meetings: Discuss Environmental Goals at following meetings.
 - a. Pre-construction meeting.
 - b. Pre-installation meetings.
 - c. Regularly scheduled job-site meetings.
 - d. Special sustainability issues meetings.
- B. Environmental Issues Criteria: Comply with requirements listed in the Specification Sections.
- C. Acceptable Indoor Air Emissions Testing Laboratories:
 1. Selection of testing laboratories shall include assessment of prior experience in conducting indoor source emissions tests.
 2. The proposed laboratory shall be an independent company or organization not related to the manufacturer of the products to be tested.
 3. Submit documentation on proposed laboratory for review and approval by Owner.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Packaging: Deliver materials in recyclable or in reusable packaging such as cardboard, wood, paper, or reusable blankets, which will be reclaimed by supplier or manufacturer for recycling.

ENVIRONMENTAL PROCEDURES

SECTION 01 3543

3595001

1. Minimize packaging materials to maximum extent possible while still ensuring protection of materials during delivery, storage, and handling.
 2. Unacceptable Packaging Materials: Polyurethane, polyisocyanate, polystyrene, polyethylene, and similar plastic materials such as “foam” plastics and “shrink-fit” plastics.
 3. Reusable Blankets: Deliver and store materials in reusable blankets and mats reclaimed by the manufacturers or suppliers for reuse where the reclamation program exists or where a program can be developed for such reuse.
 4. Pallets: Where pallets are used, suppliers shall be responsible to ensure pallets are removed from site for reuse or for recycling.
 5. Corrugated Cardboard and Paper: Where paper products are used, recycle as part of the construction waste management recycling program, or return to the material’s manufacturer for use by the manufacturer or supplier.
 6. Sealants, Paint, Primers, Adhesives, and Coating Containers: Return to the supplier or manufacturer for reuse where such program is available.
- B. Comply with the additional requirements specified in Section 01 7419, Construction Waste Management and Disposal.

1.9 FIELD CONDITIONS

- A. No smoking will be permitted in indoor Project site locations, in accordance with California Labor Code (Section 400-6413.5).
- B. Environmental Product Certification:
1. Include certification that indicates cleaning materials comply with requirements of these Specifications.
- C. Construction Ventilation and Preconditioning:
1. Temporary Construction Ventilation: Maintain sufficient temporary ventilation of areas where materials are being used that emit VOCs. Maintain ventilation continuously during installation, and until emissions dissipate following installation. If continuous ventilation is not possible utilizing the building’s HVAC system(s) then ventilation shall be supplied using open windows and temporary fans, sufficient to provide no less than three air changes per hour.
 - a. Period after installation shall be sufficient to dissipate odors and elevated concentrations of VOCs. Where no specific period is stated in these Specifications, a time period of 72 hours shall be used.
 - b. Ventilate areas directly to outside; ventilation to other enclosed areas is not acceptable.
 2. During dust producing activities, including drywall installation and finishing, turn ventilation system off, and openings in supply and return HVAC system shall be protected from dust infiltration. Provide temporary ventilation as required.
 3. Preconditioning: Prior to installation, allow products which have odors and significant VOC emissions to off-gas in dry, well-ventilated space for 14 calendar days to allow for reasonable dissipation of odors and emissions prior to delivery to Project site and installation.

- a. Condition products without containers and packaging to maximize off-gassing of VOCs
- b. Condition products in ventilated warehouse or other building. Comply with substitution requirements for consideration of other locations.

D. Protection:

- 1. Moisture Stains: Materials with evidence of moisture damage, including stains, are not acceptable, including both stored and installed materials; immediately remove from site and properly dispose.
 - a. Take special care to prevent an accumulation of moisture on installed materials and within packaging during delivery, storage, and handling to prevent development of molds and mildew on packaging and on products
 - b. Immediately remove from site and properly dispose of materials showing signs of mold and signs of mildew, including materials with moisture stains.
 - c. Replace moldy materials with new, undamaged materials.
- 2. Ducts: Seal ducts during transportation, delivery, and construction to prevent accumulation of construction dust and construction debris inside of ducts.

PART 2 - PRODUCTS

2.1 SUBSTITUTIONS

- A. Requests for substitutions shall comply with requirements specified in Specification Section 01 3300, Submittals, and with the following additional information required where environmental issues are specified:
 - 1. Indicate how each proposed substitution complies with requirements for VOCs.
 - 2. Owner, in consultation with Architect reserve the right to reject proposed substitutions where data for VOCs is not provided or where emissions of individual VOCs are higher than for the specified materials.
 - 3. Comply with the specified recycled content and other environmental requirements.

PART 3 - EXECUTION

3.1 FIELD QUALITY CONTROL

- A. Sequencing:
 - 1. On-Site Application: Where odorous and/or high VOC emitting products are applied on-site, apply prior to installation of porous and fibrous materials. Where this is not possible, protect porous materials with polyethylene vapor retarders.
 - 2. Complete interior finish material installation no less than 14 days prior to Substantial Completion to allow for Building Flush Out as described in Paragraph 3.1B.

ENVIRONMENTAL PROCEDURES

SECTION 01 3543

3595001

- B. Building Flush Out: Just prior to Substantial Completion, flush out building air continuously using maximum tempered outside air, or maximum amount of outside air while achieving reasonable indoor temperature, for at least 14 calendar days. Continuously is defined as 24 hours per day, 7 days a week. If interruptions of more than a few hours are required for testing and balancing purposes, extend flush out period accordingly in order to achieve the minimum 14 calendar day building flush out period.
 - 1. When Contractor is required to perform touch-up work, provide temporary construction ventilation during installation and extend building flush-out by a minimum of 4 calendar days after touch-up installation is complete with maximum tempered outside air for 24 hours per day.
 - 2. If construction schedule permits, extend flush-out period beyond minimum building flush out period for an additional 15 days.
 - 3. Return ventilation system to normal operation following flush-out period to minimize energy consumption.

3.2 CLEANING

- A. Clean interior and exterior surfaces exposed to view; remove temporary labels, stains, and foreign substances; polish transparent and glossy surfaces using cleaning and maintenance products that conform to standards as described in Part 1 of this Section.
- B. Clean equipment and fixtures to sanitary condition using cleaning and maintenance products that conform to standards as described in Part 1 of this Section.
- C. Products used for cleaning shall comply with Proposition 65 and the additional restrictions for volatile organic compounds specified in Section 01 6116.
- D. Vacuum carpeted and soft surfaces with high efficiency particulate arrestor (HEPA) vacuum.
- E. If ducts were not sealed during construction, and contain dust or dirt, clean ducts using HEPA vacuum immediately prior to Substantial Completion and prior to using ducts to circulate air. Oil film on sheet metal shall be removed before shipment to site. Ducts shall be inspected to confirm that no oil film is present. Remove oil film.
- F. Replace air filters, both pre and final filters, just prior to Substantial Completion.
- G. Remove and properly dispose of recyclable materials using construction waste management program described in Section 01 7419, Construction Waste Management and Disposal.

3.3 PROTECTION

- A. Protect interior materials from water intrusion or penetration where interior products are not intended for wet applications and are exposed to moisture.
- B. Protect installed products using methods that do not support growth of mold and mildew.

ENVIRONMENTAL PROCEDURES
SECTION 01 3543
3595001

1. Immediately remove from site materials with mold or mildew.

END OF SECTION

*p:\sacramento\3595 tracy unified school district\001-000_villalovoz es new shade structures\08 specifications\06 spec\04 final\freiler
- shade struct\01 3543_environmental procedures.docx*

REGULATORY REQUIREMENTS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Obtaining of Permits, Licenses and Registrations and Work to Comply with All Applicable Laws and Regulations;
- B. Special Conditions; and
- C. Quality Control.

1.02 DESCRIPTION:

This section covers the general requirements for regulatory requirements pertaining to the Work and is supplementary to all other regulatory requirements mentioned or referenced elsewhere in the Contract Documents.

1.03 REQUIREMENTS OF REGULATORY AGENCIES:

- A. All statutes, ordinances, laws, rules, codes, regulations, standards, and the lawful orders of all public authorities having jurisdiction over the Work, are hereby incorporated into these Contract Documents as if repeated in full herein and are intended to be included in any reference to Code or Building Code, unless otherwise specified, including, without limitation, the references in the list below. Contractor shall make available at the Site copies of all the listed documents applicable to the Work as the District and/or Architect may request, including, without limitation, applicable portions of the California Code of Regulations ("CCR").
 - (1) California Building Standards Administrative Code, Part 1, Title 24, CCR.
 - (2) California Building Code (CBC), Part 2, Title 24, CCR; (International Building Code volumes 1-2 and California Amendments).
 - (3) California Electrical Code (CEC), Part 3, Title 24, CCR; (National Electrical Code and California Amendments).
 - (4) California Mechanical Code (CMC), Part 4, Title 24, CCR; (Uniform Mechanical Code and California Amendments).
 - (5) California Plumbing Code (CPC), Part 5, Title 24, CCR; (Uniform Plumbing Code and California Amendments).

- (6) California Fire Code (CFC), Part 9, Title 24, CCR; (International Fire Code and California Amendments).
- (7) California Green Building Standards Code (CALGreen), Part 11, Title 24, CCR.
- (8) California Referenced Standards Code, Part 12, Title 24, CCR.
- (9) State Fire Marshal Regulations, Public Safety, Title 19, CCR.
- (10) Partial List of Applicable National Fire Protection Association (NFPA) Standards:
 - (a) NFPA 13 - Automatic Sprinkler System.
 - (b) NFPA 14 - Standpipes Systems.
 - (c) NFPA 17A - Wet Chemical System
 - (d) NFPA 24 - Private Fire Mains.
 - (e) (California Amended) NFPA 72 - National Fire Alarm Codes.
 - (f) NFPA 253 - Critical Radiant Flux of Floor Covering System.
 - (g) NFPA 2001 - Clean Agent Fire Extinguishing Systems.
- (11) California Division of the State Architect interpretation of Regulations ("DSA IR"), including, without limitation:
 - (a) DSA IR A-6 — Construction Change Document Submittal and Approval Processes.
 - (b) DSA IR A-7 — Project Inspector Certification and Approval.
 - (c) DSA IR A-8 — Project Inspector and Assistant Inspector Duties and Performance.
 - (d) DSA IR A-12 — Assistant Inspector Approval.
- (12) DSA Procedures ("DSA PR")
 - (a) DSA PR 13-01 – Construction Oversight Process
 - (b) DSA PR 13-02 – Project Certification Process

B. This Project shall be governed by applicable regulations, including, without limitation, the State of California's Administrative Regulations for the Division of the State Architect-Structural Safety (DSA/SS), Chapter 4, Part 1, Title 24, CCR, and the most current version on the date the bids are opened and as it pertains to school construction including, without limitation:

- (1) Test and testing laboratory per Section 4-335. District shall pay for the testing laboratory.
- (2) Special inspections per Section 4-333(c).
- (3) Deferred Approvals per section 4-317(g).
- (4) Verified reports per Sections 4-336 & 4-343(c).
- (5) Duties of the Architect & Engineers shall be per Sections 4-333(a) and 4-341.
- (6) Duties of the Contractor shall be per Section 4-343.
- (7) Duties of Project Inspector shall be per Section 4-334.
- (8) Addenda and Construction Change Documents per Section 4-338.

Contractor shall keep and make available all applicable parts of the most current version of Title 24 referred to in the plans and specifications at the Site during construction.

C. Items of deferred approval shall be clearly marked on the first sheet of the Architect's and/or Engineer's approved Drawings. All items later submitted for approval shall be per Title 24 requirements to the DSA.

- (1) Contractor shall submit the following to Architect for review and endorsement:
 - (a) Product information on proposed material/system supplier.
 - (b) Drawings, specifications, and calculations prepared, signed, and stamped by an architect or engineer licensed in the State of California for that portion of the Work.
 - (c) All other requirements as may be required by DSA.
- (2) Cost of preparing and submitting documentation per DSA Deferred Approval requirements including required modifications to Drawings and Specifications, whether or not indicated in the Contract Documents, shall be borne by Contractor.
- (3) Contractor shall not begin fabrication and installation of deferred approval items without first obtaining DSA approval of Drawings and Specifications.
- (4) Schedule of Work Subject to DSA Deferred Approval: Window wall systems exceeding 10 feet in span.

PART 2 – PRODUCTS Not Used.

PART 3 – EXECUTION Not Used.

END OF DOCUMENT

ABBREVIATIONS AND ACRONYMS

PART 1 – GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions including without limitation, Definitions;
- B. Special Conditions.

1.02 DOCUMENT INCLUDES:

- A. Abbreviations used throughout the Contract Documents.
- B. Reference to a technical society, organization, or body is by abbreviation, as follows:

1.	AA	The Aluminum Association
2.	AASHTO	American Association of State Highway and Transportation Officials
3.	ABPA	Acoustical and Board Products Association
4.	ACI	American Concrete Institute
5.	AGA	American Gas Association
6.	AGC	Associated General Contractors of America
7.	AHC	Architectural Hardware Consultant
8.	AHRI	Air Conditioning, Heating, Refrigeration Institute
9.	AI	Asphalt Institute
10.	AIA	American Institute of Architects
11.	AISC	American Institute of Steel Construction
12.	AISI	American Iron and Steel Institute
13.	AMCA	Air Movement and Control Association
14.	ANSI	American National Standards Institute
15.	APA	APA – The Engineered Wood Association
16.	ASCE	American Society of Civil Engineers
17.	ASHRAE	American Society of Heating, Refrigeration and Air Conditioning Engineers
18.	ASME	American Society of Mechanical Engineers
19.	ASTM	American Society of Testing and Materials International
20.	AWPA	American Wood Protection Association
21.	AWPI	American Wood Preservers Institute
22.	AWS	American Welding Society
23.	AWSC	American Welding Society Code
24.	AWI	Architectural Woodwork Institute
25.	AWWA	American Water Works Association
26.	BIA	The Brick Industry Association

27.	CCR	California Code of Regulations
28.	CLFMI	Chain Link Fence Manufacturers Institute
29.	CRA	California Redwood Association
30.	CRSI	Concrete Reinforcing Steel Institute
31.	CS	Commercial Standards
32.	CSI	Construction Specifications Institute
33.	CTI	Cooling Technology Institute
34.	FGIA	Fenestration and Glazing Industry Alliance
35.	FGMA	Flat Glass Manufacturers' Association
36.	FIA	Factory Insurance Association
37.	FM	Factory Mutual Global
38.	FS/FED SPEC	Federal Specification
39.	FTI	Facing Title Institute
40.	GA	Gypsum Association
41.	IAPMO	International Association of Plumbing and Mechanical Officials
42.	ICC	International Code Council
43.	IEEE	Institute of Electrical and Electronics Engineers
44.	IES	Illuminating Engineering Society
45.	MCAC	Mason Contractors Association of California
46.	MIMA	Mineral Wool Insulation Manufacturers Association
47.	MLMA	Metal Lath Manufacturers Association
48.	MS/MIL SPEC	Military Specifications
49.	NAAMM	National Association of Architectural Metal Manufacturers
50.	NBHA	National Builders Hardware Association
51.	NCMA	National Concrete Masonry Association
52.	NCSEA	National Council of Structural Engineers Associations
53.	NEC	National Electrical Code
54.	NEMA	National Electrical Manufacturers Association
55.	NIST	National Institute of Standards and Technology
56.	NSI	Natural Stone Institute
57.	NTMA	National Terrazzo and Mosaic Association, Inc.
58.	ORS	Office of Regulatory Services (California)
59.	OSHA	Occupational Safety and Health Act
60.	PCI	Precast/Prestressed Concrete Institute
61.	PCA	Portland Cement Association
62.	PCA	Painting Contractors Association
63.	PDI	Plumbing Drainage Institute
64.	PEI	Porcelain Enamel Institute, Inc.
65.	PG&E	Pacific Gas & Electric Company
66.	PS	Product Standards
67.	SDI	Steel Door Institute; Steel Deck Institute
68.	SJI	Steel Joist Institute
69.	SSPC	Society for Protective Coatings
70.	TCNA	Tile Council of North America, Inc.
71.	TPI	Truss Plate Institute
72.	UBC	Uniform Building Code
73.	UL	Underwriters Laboratories Code

74.	UMC	Uniform Mechanical Code
75.	USDA	United States Department of Agriculture
76.	VI	Vermiculite Institute
77.	WCLIB	West Coast Lumber Inspection Bureau
78.	WDMA	Window and Door Manufacturers Association
79.	WEUSER	Western Electric Utilities Service Engineering Requirements
80.	WIC	Woodwork Institute of California

PART 2 - PRODUCTS Not Used.

PART 3 - EXECUTION Not Used.

END OF DOCUMENT

DEFINITIONS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions including without limitation, Definitions;
- B. Special Conditions.

1.02 QUALITY ASSURANCE

- A. For products or workmanship specified by association, trade, or Federal Standards, Contractor shall comply with requirements of the standard, except when more rigid requirements are specified in the Contract Documents, or are required by applicable codes.
- B. Contractor shall conform to current reference standard publication date in effect on the date of bid opening.
- C. Contractor shall obtain copies of standards unless specifically required not to by the Contract Documents.
- D. Contractor shall maintain a copy of all standards at jobsite during submittals, planning, and progress of the specific Work, until final completion, unless specifically required not to by the Contract Documents.
- E. Should specified reference standards conflict with Contract Documents, Contractor shall request clarification from the District and/or the Architect before proceeding.
- F. The contractual relationship of the parties to the Contract shall not be altered from the contractual relationship as indicated in the Contract Documents by mention or inference otherwise in any referenced document.
- G. Governing Codes shall be as shown in the Contract Documents including, without limitation, the Specifications.

END OF DOCUMENT

REFERENCES**PART 1 - GENERAL****1.01 SCHEDULE OF REFERENCES:**

The following information is intended only for the general assistance of the Contractor, and the District does not represent that all of the information is current. It is the Contractor's responsibility to verify the correct information for each of the entities listed.

AA	The Aluminum Association 1400 Crystal Drive, Suite 430 Arlington, VA 22202 www.aluminum.org	703/358-2960
AABC	Associated Air Balance Council 2401 Pennsylvania Avenue NW, Suite 330 Washington, DC 20037 www.aabc.com	202/737-0202
AASHTO	American Association of State Highway and Transportation Officials 555 12th St. NW - Suite 1000 Washington, DC 20004 www.transportation.org	202/624-5800
AATCC	American Association of Textile Chemists and Colorists P.O. Box 12215 Research Triangle Park, NC 27709-2215 www.aatcc.org	919/549-8141
ACA	American Coatings Association 901 New York Ave., NW, Suite 300 West Washington, DC 20001 www.paint.org	202/462-6272
ACI	American Concrete Institute 38800 Country Club Dr. Farmington Hills, MI 48331-3439 www.concrete.org	248/848-3800
ACPA	American Concrete Pipe Association 5605 N. MacArthur Blvd., Suite 340 Irving, TX 75038 www.concrete-pipe.org	972/506-7216

ADC	Air Duct Council 1901 N. Roselle Road, Suite 800 Schaumburg, IL 60195 www.flexibleduct.org	847/706-6750
AF&PA	American Forest and Paper Association 1101 K Street, NW, Suite 700 Washington, DC 20005 www.afandpa.org	202/463-2700
AGA	American Gas Association 400 North Capitol Street, NW, Suite 450 Washington, DC 20001 www.aga.org	202/824-7000
AGC	Associate General Contractors of America 2300 Wilson Blvd., Suite 300 Arlington, VA 22201 www.agc.org	703/548-3118
AHA	American Hardboard Association 1210 West Northwest Highway Palatine, IL 60067 http://domensino.com/AHA/default.htm	847/934-8800
AI	Asphalt Institute 2696 Research Park Drive Lexington, KY 40511-8480 www.asphaltinstitute.org	859/288-4960
AIA	The American Institute of Architects 1735 New York Ave., NW Washington, DC 20006-5292 www.aia.org	202/626-7300
AISC	American Institute of Steel Construction 130 East Randolph Street, Suite 2000 Chicago, IL 60601 www.aisc.org	312.670.2400
AISI	American Iron and Steel Institute 25 Massachusetts Ave., NW, Suite 800 Washington, DC 20001 www.steel.org	202/452-7100
AITC	American Institute of Timber Construction 1010 South 336th Street, #210 Federal Way, WA 98003-7394 https://www.plib.org/aitc/	253/835-3344

ALI	Associated Laboratories, Inc. P.O. Box 152837 Dallas, TX 75315 www.assoc-labs.com	214/565-0593
ALSC	American Lumber Standards Committee, Inc. 7470 New Technology Way, Suite F Frederick, MD 21703 www.alsc.org	301/972-1700
AMCA	Air Movement and Control Association International, Inc. 30 W. University Drive Arlington Heights, IL 60004 www.amca.org	847/394-0150
AMPP (formerly SSPC)	Association for Materials Protection and Performance (merger of Society for Protective Coatings and National Association of Corrosion Engineers International) (formerly Steel Structures Painting Council) 800 Trumbull Drive Pittsburgh, PA 15205 www.sspc.org	412/281-2331 877/281-7772
ANLA	AmericanHort (merger of American Nursery & Landscape Association and OFA – The Association of Horticultural Professionals) 2130 Stella Court Columbus, OH 43215 www.americanhort.org	614/487-1117
ANSI	American National Standards Institute 1899 L Street, NW, 11th Floor Washington, DC 20036 www.ansi.org	202/293-8020
APA	APA-The Engineered Wood Association 7011 S. 19th Street Tacoma, WA 98466-5333 www.apawood.org	253/565-6600

APA	Architectural Precast Association 325 John Knox Rd, Suite L-103 Tallahassee, FL 32303 www.archprecast.org	850/205-5637
APCIA	American Property Casualty Insurance Association (merger of American Insurance Association (formerly the National Board of Fire Underwriters) with the Property Casualty Insurers Association of America) 555 12th St, NW, Suite 550 Washington DC 20004 www.apci.org	202/828-7100
AHRI	Air Conditioning and Refrigeration Institute (now Air-Conditioning, Heating, & Refrigeration Institute) 2311 Wilson Blvd, Suite 400 Arlington, VA 22201 www.ahrinet.org	703/524-8800
ARMA	Asphalt Roofing Manufacturers Association 2331 Rock Spring Road Forest Hill, MD 21050 www.asphaltroofing.org	443/640-1075
ASA	The Acoustical Society of America Suite 300 1305 Walt Whitman Road Melville, NY 11747-4300 https://acousticalsociety.org/	516/576-2360
ASCE	American Society of Civil Engineers 1801 Alexander Bell Drive Reston, VA 20191 www.asce.org	800/548-2723 703/295-6300
ASHRAE	American Society of Heating, Refrigerating and Air Conditioning Engineers 180 Technology Parkway Peachtree Corners, GA 30092 www.ashrae.org	800/527-4723 404/636-8400
ASLA	American Society of Landscape Architects 636 Eye Street, NW Washington, DC 20001-3736 www.asla.org	202/898-2444
ASME	American Society of Mechanical Engineers Two Park Avenue New York, NY 10016-5990 www.asme.org	800/834-2763

ASPE	American Society of Plumbing Engineers 6400 Shafer Court, Suite 350 Rosemont, IL 60018 http://aspe.org	847/296-0002
ASQ	American Society for Quality P.O. Box 3005 Milwaukee, WI 53201-3005 or 600 North Plankinton Avenue Milwaukee, WI 53203 http://asq.org	800/248-1946 414/272-8575
ASSE	American Society of Sanitary Engineering 18927 Hickory Creek Dr., Suite 220 Mokena, IL 60448 www.asse-plumbing.org	708/995-3019
ASTM	ASTM International 100 Barr Harbor Drive PO Box C700 West Conshohocken, PA, 19428-2959 www.astm.org	610/832-9500
AWCI	Association of the Wall and Ceiling Industry 513 West Broad Street, Suite 210 Falls Church, VA 22046 www.awci.org	703/538-1600
AWPA	American Wood Protection Association (formerly American Wood Preservers Institute) P.O. Box 361784 Birmingham, AL 35236-1784 www.awpa.com	205/733-4077
AWS	American Welding Society 8669 NW 36 Street, Suite 130 Miami, FL 33166 www.aws.org	800/443-9353 305/443-9353
AWI	Architectural Woodwork Institute 46179 Westlake Drive, Suite 120 Potomac Falls, VA 20165-5874 www.awinet.org	571/323-3636
AWWA	American Water Works Association 6666 West Quincy Avenue Denver, CO 80235 www.awwa.org	800/926-7337 303/794-7711

BHMA	Builders Hardware Manufacturers Association 355 Lexington Avenue, 15th Floor New York, NY 10017 www.buildershardware.com	212/297-2122
BIA	The Brick Industry Association 12007 Sunrise Valley Drive, Suite 430 Reston, VA 20191 www.gobrick.com	703/620-0010
CGA	Compressed Gas Association 8484 Westpark Drive, Suite 220 McLean, VA 22102 www.cganet.com	703/788-2700
CISCA	Ceilings & Interior Systems Construction Association 1010 Jorie Blvd, Suite 30 Oak Brook, IL 60523 www.cisca.org	630/584-1919
CISPI	Cast Iron Soil Pipe Institute 2401 Fieldcrest Dr. Mundelein, IL 60060 www.cispi.org	224/864-2910
CLFMI	Chain Link Fence Manufacturers Institute 10015 Old Columbia Road, Suite B-215 Columbia, MD 21046 chainlinkinfo.org	301/596-2583
CPA	Composite Panel Association 19465 Deerfield Avenue, Suite 306 Leesburg, VA 20176 www.compositepanel.org	703/724-1128
CPSC	Consumer Product Safety Commission 4330 East-West Highway Bethesda, MD 20814 www.cpsc.gov	800/638-2772
CRA	California Redwood Association 818 Grayson Road, Suite 201 Pleasant Hill, CA 94523 www.calredwood.org	925/935-1499

CRI	Carpet and Rug Institute 100 S. Hamilton Street Dalton, GA 30722-2048 www.carpet-rug.org	706/278-3176
CRSI	Concrete Reinforcing Steel Institute 933 N. Plum Grove Road Schaumburg, IL 60173-4758 www.crsi.org	847/517-1200
CSI	The Construction Specifications Institute 123 North Pitt St, Suite 450 Alexandria, VA 22314 www.csinet.org	800/689-2900
CTIOA	Ceramic Tile Institute of America 12061 Jefferson Blvd. Culver City, CA 90230-6219 www.ctioa.org	310/574-7800
DHA	Decorative Hardwoods Association (formerly Hardwood Plywood & Veneer Association) 42777 Trade West Dr. Sterling, VA 20166 https://www.decorativehardwoods.org/	703/435-2900
DHI	Door and Hardware Institute (formerly National Builders Hardware Association) 2001 K Street NW, 3rd Floor North Washington, DC 20006 www.dhi.org	202/367-1134
DIPRA	Ductile Iron Pipe Research Association P.O. Box 190306 Birmingham, AL 35219 www.dipra.org	205/402-8700
DOC	U.S. Department of Commerce 1401 Constitution Ave., NW Washington, DC 20230 www.commerce.gov	202/482-2000
DOT	U.S. Department of Transportation 1200 New Jersey Avenue, SE Washington, DC 20590 www.dot.gov	855/368-4200
EJMA	Expansion Joint Manufacturers Association, Inc. 25 North Broadway Tarrytown, NY 10591 www.ejma.org	914/332-0040

EPA	Environmental Protection Agency Ariel Rios Building 1200 Pennsylvania Avenue, N.W. Washington, DC 20460 www.epa.gov	202/272-0167
FCICA	Floor Covering Installation Contractors Association 800 Roosevelt Rd., Bldg. C, Suite 312 Glen Ellyn, IL 60137 www.fcica.com	630/672-3702
FGIA	Fenestration and Glazing Industry Alliance 1900 E Golf Rd, Suite 1250 Schaumburg, IL 60173 https://fgiaonline.org/	847/303-5664
FM Global	Factory Mutual Insurance Company Amy Daley Global Practice Leader – Education, Public Entities, Health Care FM Global 270 Central Avenue Johnston, RI 02919-4949 www.fmglobal.com	401/275-3000 401/275-3029
FS	General Services Administration (GSA) Index of Federal Specifications, Standards and Commercial Item Descriptions 470 East L'Enfant Plaza, SW, Suite 8100 Washington, DC 20407 www.gsa.gov	202/619-8925
GA	The Gypsum Association 962 Wayne Ave., Suite 620 Silver Spring, MD 20910 www.gypsum.org	301/277-8686
HMA	Hardwood Manufacturers Association One Williamsburg Place, Suite 108 Warrendale, PA 15086 http://hmamembers.org	412/244-0440

IAPMO	International Association of Plumbing and Mechanical Officials (formerly the Western Plumbing Officials Association) 4755 E. Philadelphia St. Ontario, CA 91761 www.iapmo.org	909/472-4100
ICC	International Code Council 500 New Jersey Avenue, NW, 6th Floor Washington, DC 20001 www.iccsafe.org	888/422-7233
IEEE	Institute of Electrical and Electronics Engineers 3 Park Avenue, 17th Floor New York, NY 10016-5997 www.ieee.org	212/419-7900
IES	Illuminating Engineering Society 120 Wall Street, Floor 17 New York, NY 10005-4001 www.ies.org	212/248-5000
ITRK	Intertek Testing Services 3933 US Route 11 Cortland, NY 13045 www.intertek.com	607/753-6711
MCAA	Mechanical Contractors Association of America 1385 Piccard Drive Rockville, MD 20850 www.mcaa.org	301/869-5800
MMPA (formerly WMMPA)	Moulding & Millwork Producers Association (formerly Wood Moulding & Millwork Producers Association) 507 First Street Woodland, CA 95695 www.wmmpa.com	530/661-9591 800/550-7889
MSS	Manufacturers Standardization Society (MSS) of the Valve and Fittings Industry, Inc. 127 Park Street, NE Vienna, VA 22180-4602 http://mss-hq.org	703/281-6613
NAAMM	National Association of Architectural Metal Manufacturers 800 Roosevelt Rd. Bldg. C, Suite 312 Glen Ellyn, IL 60137 www.naamm.org	630/942-6591

NAIMA	North American Insulation Manufacturers Association P.O. Box 1906 Alexandria, VA 22313 https://insulationinstitute.org/	703/684-0084
NALP	National Association of Landscape Professionals (formerly Professional Landcare Network) 12500 Fair Lakes Circle, Suite 200 Fairfax, VA 22033 https://www.landscapeprofessionals.org/	703/736-9666
NAPA	National Asphalt Pavement Association 6406 Ivy Lane, Suite 350 Greenbelt, MD 20770-1441 www.asphaltpavement.org	888/468-6499 301/731-4748
NCSPA	National Corrugated Steel Pipe Association 14070 Proton Road, Suite 100 Dallas, TX 75244 www.ncspa.org	972/850-1907
NCMA	National Concrete Masonry Association 13750 Sunrise Valley Drive Herndon, VA 20171-4662 www.ncma.org	703/713-1900
NEBB	National Environmental Balancing Bureau 8575 Grovemont Circle Gaithersburg, MD 20877 www.nebb.org	301/977-3698
NECA	National Electrical Contractors Association 1201 Pennsylvania Ave. NW Washington, D.C., 20004 www.necanet.org	202/991-6300
NEMA	National Electrical Manufacturers Association 1300 North 17th Street N, Suite 900 Rosslyn, VA 22209 www.nema.org	703/841-3200
NEII	National Elevator Industry, Inc. 5537 SW Urish Road Topeka, KS 66610 https://nationalelevatorindustry.org/	703/589-9985
NFPA	National Fire Protection Association 1 Batterymarch Park Quincy, MA 02169-7471 www.nfpa.org	800/344-3555 855/274-8525

NGA (formerly GANA)	National Glass Association (merged with Glass Association of North America) 1945 Old Gallows Road Suite 750 Vienna, VA 22182 www.glass.org	866/342-5642 Ext 127
NHLA	National Hardwood Lumber Association PO Box 34518 Memphis, TN 38184 www.nhla.com	901/377-1818
NIA	National Insulation Association 516 Herndon Pkwy., Ste. D Herndon, VA 20170 www.insulation.org	703/464-6422
NRCA	National Roofing Contractors Association 10255 W. Higgins Road, Suite 600 Rosemont, IL 60018-5607 www.nrca.net	847/299-9070
NSF	NSF International 789 N. Dixboro Road Ann Arbor, MI 48113-0140 www.nsf.org	800/673-6275 734/769-8010
NSI	Natural Stone Institute (formerly Marble Institute of America) 380 E. Lorain St. Oberlin, OH 44074 https://www.naturalstoneinstitute.org/	440/250-9222
NTMA	National Terrazzo and Mosaic Association 209 N. Crockett Street, Suite 2 PO Box 2605 Fredericksburg, TX 78624 www.ntma.com	800/323-9736
OSHA	Occupational Safety and Health Act U.S. Department of Labor Occupational Safety & Health Administration 200 Constitution Ave., NW Washington, DC 20210 www.osha.gov	800/321-OSHA (6742)

PCA	Portland Cement Association 5420 Old Orchard Road Skokie, IL 60077 or 200 Massachusetts Ave NW, Suite 200 Washington, DC 20001 www.cement.org	847/966-6200 202/408-9494
PCA	Painting Contractors Association (formerly Painting and Decorating Contractors of America) 2316 Millpark Drive Maryland Heights, MO 63043 https://www.pcapainted.org/	800/322-7322
PCI	Precast/Prestressed Concrete Institute 8770 W. Bryn Mawr Ave., Suite 1150 Chicago, IL 60631 www.pci.org	312/786-0300
PDI	Plumbing & Drainage Institute 800 Turnpike Street, Suite 300 North Andover, MA 01845 http://pdionline.org	978/557-0720 800/589-8956
PEI	Porcelain Enamel Institute, Inc. P.O. Box 920220 Norcross, GA 30010 www.porcelainenamel.com	770/676-9366
PG&E	Pacific Gas & Electric Company P.O. Box 997300 Sacramento, CA 95899-7300 www.pge.com	800/743-5000
PLIB	Pacific Lumber Inspection Bureau (formerly West Coast Lumber Inspection Bureau) 1010 South 336th Street, Suite 210 Federal Way, WA 98003-7394 https://www.plib.org/	253/835-3344
RFCI	Resilient Floor Covering Institute 115 Broad Street, Suite 201 La Grange, GA 30240 www.rfci.com	706/882-3833
SDI	Steel Deck Institute P.O. Box 426 Glenshaw, PA 15116 www.sdi.org	412/487-3325

SDI	Steel Door Institute 30200 Detroit Road Westlake, OH 44145 www.steeldoor.org	440/899-0010
SJI	Steel Joist Institute 140 West Evans Street, Suite 203 Florence, SC 29501 http://steeljoist.org	843/407-4091
SMA	Stucco Manufacturers Association 5753 E Santa Ana Cyn Rd, #G-156 Anaheim, CA 92807 www.stuccomfgassoc.com	714/473-9579
SMACNA	Sheet Metal and Air Conditioning Contractors' National Association 4201 Lafayette Center Drive Chantilly, VA 20151-1219 www.smacna.org	703/803-2980
SPI	SPI: The Plastics Industry Trade Association, Inc. 1425 K St. NW, Suite 500 Washington, DC 20005 www.plasticsindustry.org	202/974-5200
TCA	The Tile Council of North America 100 Clemson Research Blvd. Anderson, SC 29625 www.tcnatile.com	864/646-8453
TPI	Truss Plate Institute 2670 Crain Highway, Suite 203 Waldorf, MD 20601 www.tpinst.org	240/587-5582
TPI	Turfgrass Producers International 444 E. Roosevelt Road #346 Lombard, IL 60148 www.turfgrasssod.org	800/405-8873 847/649-5555
TCIA	Tree Care Industry Association (formerly the National Arborist Association) 670 N Commercial Street, Suite 201 Manchester, NH 03101 www.tcia.org	603/314-5380 800/733-2622

TVI	The Vermiculite Institute c/o The Schundler Company 10 Central Street Nahant, MA 01908 www.vermiculiteinstitute.org	732/287-2244
UL	Underwriters Laboratories Inc. 333 Pfingsten Road Northbrook, IL 60062-2096 www.ul.com	847/272-8800 877/854-3577
UNI	Uni-Bell PVC Pipe Association 201 E. John Carpenter Freeway, Suite 750 Irving, TX 75062 www.uni-bell.org	972/243-3902
USDA	U.S. Department of Agriculture 1400 Independence Ave., S.W. Washington, DC 20250 www.usda.gov	202/720-2791
WA	Wallcoverings Association 35 E Wacker Dr., Suite 850 Chicago, IL 60601 www.wallcoverings.org	312/224-2574
WCMA	Window Covering Manufacturers Association 355 Lexington Avenue 15th Floor New York, NY 10017 www.wcmanet.org	212/297-2122
WDMA	Window & Door Manufacturers Association 2001 K Street NW, 3rd Floor North Washington, D.C. 20006 www.wdma.com	202/367-1157
WI	Woodwork Institute 1455 Response Road, Suite 110 Sacramento, CA 95815 www.wicnet.org	916/372-9943
WRI	Wire Reinforcement Institute 942 Main Street, Suite 300 Hartford, CT 06103 www.wirereinforcementinstitute.org	860/240-9545
WWCA	Western Wall & Ceiling Contractors Association 1910 N. Lime St. Orange, CA 92865 www.wwcca.org	714/221-5520

WWPA	Western Wood Products Association (formerly Redwood Inspection Service) 1500 SW First Ave., Suite 870 Portland, OR 97201 www.wwpa.org	503/224-3930
------	--	--------------

PART 2 - PRODUCTS Not Used.

PART 3 - EXECUTION Not Used.

END OF DOCUMENT

MATERIALS AND EQUIPMENT

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Purchase of Materials and Equipment;
- B. Special Conditions;
- C. Imported Materials Certification.

1.02 MATERIAL AND EQUIPMENT

- A. Only items approved by the District and/or Design Professional shall be used.
- B. Contractor shall submit lists of products and other product information in accordance with the Contract Documents, including, without limitation, the provisions regarding the submittals.

1.03 MATERIAL AND EQUIPMENT COLORS

- A. The District and/or Architect will provide a schedule of colors.
- B. No individual color selections will be made until after approval of all pertinent materials and equipment and after receipt of appropriate samples in accordance with the Contract Documents, including, without limitation, the provisions regarding the submittals.
- C. Contractor shall request priority in writing for any item requiring advance ordering to maintain the approved Construction Schedule.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. Contractor shall deliver manufactured materials in original packages, containers, or bundles (with seals unbroken), bearing name or identification mark of manufacturer.
- B. Contractor shall deliver fabrications in as large assemblies as practicable; where specified as shop-primed or shop-finished, package or crate as required to preserve such priming or finish intact and free from abrasion.
- C. Contractor shall store materials in such a manner as necessary to properly protect them from damage. Materials or equipment damaged by handling, weather, dirt, or from any other cause will not be accepted.

- D. Materials are not acceptable that have been warehoused for long periods of time, stored or transported in improper environment, improperly packaged, inadequately labeled, poorly protected, excessively shipped, deviated from normal distribution pattern, or reassembled.
- E. Contractor shall store material so as to cause no obstructions of sidewalks, roadways, access to the Site or buildings, and underground services. Contractor shall protect material and equipment furnished under Contract.
- F. Contractor may store materials on Site with prior written approval by the District, all material shall remain under Contractor's control and Contractor shall remain liable for any damage to the materials. Should the Project Site not have storage area available, the Contractor shall provide for off-site storage at a bonded warehouse and with appropriate insurance coverage at no cost to District.
- G. When any room in Project is used as a shop or storeroom, the Contractor shall be responsible for any repairs, patching, or cleaning necessary due to that use. Location of storage space shall be subject to prior written approval by District.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Manufacturers listed in various sections of Contract Documents are names of those manufacturers that are believed to be capable of supplying one or more of items specified therein.
- B. The listing of a manufacturer does not imply that every product of that manufacturer is acceptable as meeting the requirements of the Contract Documents.

2.02 FACILITIES AND EQUIPMENT

Contractor shall provide, install, maintain, and operate a complete and adequate facility for handling, the execution, disposal, and distribution of material and equipment as required for proper and timely performance of Work connected with Contract.

2.03 MATERIAL REFERENCE STANDARDS

Where material is specified solely by reference to "standard specifications" and if requested by District, Contractor shall submit for review data on actual material proposed to be incorporated into Work of Contract listing name and address of vendor, manufacturer, or producer, and trade or brand names of those materials, and data substantiating compliance with standard specifications.

PART 3 - EXECUTION

3.01 WORKMANSHIP

- A. Where not more specifically described in any other Contract Documents, workmanship shall conform to methods and operations of best standards and accepted practices of trade or trades involved and shall include items of fabrication, construction, or installation regularly furnished or required for completion (including finish and for successful operation, as intended).
- B. Work shall be executed by tradespersons skilled in their respective lines of Work. When completed, parts shall have been durably and substantially built and present a neat appearance.

3.02 COORDINATION

- A. Contractor shall coordinate installation of Work so as to not interfere with installation of others. Adjustment or rework because of Contractor's failure to coordinate will be at no additional cost to District.
- B. Contractor shall examine in-place work for readiness, completeness, fitness to be concealed or to receive other work, and in compliance with Contract Documents. Concealing or covering Work constitutes acceptance of additional cost which will result should in-place Work be found unsuitable for receiving other Work or otherwise deviating from the requirements of the Contract Documents.

3.03 COMPLETENESS

Contractor shall provide all portions of the Work, unless clearly stated otherwise, installed complete and operational with all elements, accessories, anchorages, utility connections, etc., in manner to assure well-balanced performance, in accordance with manufacturer's recommendations and by Contract Documents. Terms such as "installed complete," "operable condition," "for use intended," "connected to all utilities," "terminate with proper cap," "adequately anchored," "patch and refinish," "to match similar," should be assumed to apply in all cases, except where completeness of functional or operable condition is specifically stated as not required.

3.04 APPROVED INSTALLER OR APPLICATOR

Installation by a manufacturer's approved installer or applicator is an understood part of Specifications and only approved installer or applicator is to provide on-site Work where specified manufacturer has on-going program of approving (i.e. certifying, bonding, re-warranting) installers or applicators. Newly established relationships between a manufacturer and an installer or applicator who does not have other approved applicator work in progress or completed is not approved for this Project.

3.05 MANUFACTURER'S RECOMMENDATIONS

All installations shall be in accordance with manufacturer's published recommendations and specific written directions of manufacturer's representative.

Should Contract Documents differ from recommendations of manufacturer or directions of his representative, Contractor shall analyze differences, make recommendations to the District and the Architect in writing, and shall not proceed until interpretation or clarification has been issued by the District and/or the Architect.

END OF DOCUMENT

QUALITY CONTROL

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Inspector, Inspections and Tests, Uncovering of Work and Non-conforming of Work and Correction of Work;
- B. Special Conditions.

1.02 RELATED CODES:

- A. The Work is governed by requirements of Title 24, California Code of Regulations ("CCR"), and the Contractor shall keep a copy of these available at the job Site for ready reference during construction.
- B. The Division of the State Architect ("DSA") shall be notified at or before the start of construction.

1.03 OBSERVATION AND SUPERVISION:

- A. The District and Architect or their appointed representatives will review the Work and the Contractor shall provide facilities and access to the Work at all times as required to facilitate this review. Administration by the Architect and any consulting Structural Engineer will be in accordance with applicable regulations, including, without limitation, CCR, Part 1, Title 24, Section 4-341.
- B. One or more Project Inspector(s) approved by DSA and employed by or in contract with the District, referred to hereinafter as the "Project Inspector", will observe the work in accordance with CCR, Part 1, Title 24, Sections 4-333(b) and 4-342:
 - (1) The Project Inspector and Special Inspector(s) shall have access to the Work wherever it is in preparation or progress for ascertaining that the Work is in accordance with the Contract Documents and all applicable code sections. The Contractor shall provide facilities and operation of equipment as needed, and access as required and shall provide assistance for sampling or measuring materials.
 - (2) The Project Inspector will notify the District and Architect and call the attention of the Contractor to any observed failure of Work or material to conform to Contract Documents.

The Contractor shall conform with all applicable laws as indicated in the Contract Documents, including, without limitation, to CCR, Part 1, Title 24, Section 4-343.

The Contractor shall supervise and direct the Work and maintain a competent superintendent on the job who is authorized to act in all matters pertaining to the Work. The Contractor's superintendent shall also inspect all materials, as they arrive, for compliance with the Contract Documents. Contractor shall reject defective Work or materials immediately upon delivery or failure of the Work or material to comply with the Contract Documents. The Contractor shall submit verified reports as indicated in the Contract Documents, including, without limitation, the Specifications and as required by Part 1, Title 24, Section 4-336.

1.04 TESTING AGENCIES:

- A. Testing agencies and tests shall be in conformance with the General Documents and the requirements of Part 1, Title 24, Section 4- 335.
- B. Testing and inspection in connection with earthwork shall be under the direction of the District's consulting soils engineer, if any, referred to hereinafter as the "Soils Engineer."
- C. Testing and inspection of construction materials and workmanship shall be performed by a qualified laboratory, referred to hereinafter as the "Testing Laboratory." The Testing Laboratory shall be under direction of an engineer registered in the State of California, shall conform to requirements of ASTM E329, and shall be employed by or in contract with the District.
- D. Testing laboratory shall be approved by the Architect and the Division of the State Architect.
- E. Owner will employ and pay for services of an independent testing labatory to perform specified inspection and testing. Retesting cost for failed test will be Contractors responsibilityand will be back-charged against the contract.

1.05 TESTS AND INSPECTIONS:

- A. The Contractor shall be responsible for notifying the District and Project Inspector of all required tests and inspections. Contractor shall notify the District and Project Inspector at least seventy-two hours (72) hours in advance of performing any Work requiring testing or inspection.
- B. The Contractor shall provide access to Work to be tested and furnish incidental labor, equipment, and facilities to facilitate all inspections and tests.
- C. The District will pay for first inspections and tests required by the "CCR", and other inspections or tests that the District and/or the Architect may direct to have made, including the following principal items:
 - (1) Tests and observations for earthwork and paving.
 - (2) Tests for concrete mix designs, including tests of trial batches.
 - (3) Tests and inspections for structural steel work.
 - (4) Field tests for framing lumber moisture content.

- (5) Additional tests directed by the District that establish that materials and installation comply with the Contract Documents.
 - (6) Tests and observations of welding and expansion anchors.
- D. The District may at its discretion, pay and then back charge the Contractor for:
 - (1) Retests or reinspections, if required, and tests or inspections required due to Contractor error or lack of required identifications of material.
 - (2) Uncovering of work in accordance with Contract Documents.
 - (3) Testing done on weekends, holidays, and overtime will be chargeable to the Contractor for the overtime portion.
 - (4) Testing done off Site.
- E. Testing and inspection reports and certifications:
 - (1) If initially received by Contractor, Contractor shall provide to each of the following a copy of the agency or laboratory report of each test or inspection or certification.
 - (a) The District;
 - (b) The Construction Manager, if any;
 - (c) The Architect;
 - (d) The Consulting Engineer, if any;
 - (e) Other engineers on the Project, as appropriate;
 - (f) The Project Inspector; and
 - (g) The Contractor.
 - (2) When the test or inspection is one required by the CCR, a copy of the report shall also be provided to the DSA.

1.06 LABORATORY REPORTS

- A. After each inspection and test, promptly submit two copies of laboratory report to Owner, Architect, Contractor and DSA.
- B. Include:
 - (1) Date of issue,
 - (2) DSA Application and File numbers,
 - (3) Project title and number,

- (4) Name of inspector,
- (5) Date and time of sampling or inspection,
- (6) Identification of product and Specification Section,
- (7) Location in the Project,
- (8) Type of inspection or test,
- (9) Date of test,
- (10) Results of test,
- (11) Conformance with Contract Documents.

C. When requested by Architect, provide interpretation of test results.

1.07 LIMITS ON TESTING LABORATORY AUTHORITY

- A. Laboratory may not release, revoke, alter or enlarge on requirements of Contract Documents.
- B. Laboratory may not approve or accept any portion of the work.
- C. Laboratory may not assume any duties of Contractor.
- D. Laboratory has no authority to stop the work.

PART 2 - PRODUCTS

2.01 TYPE OF TEST AND INSPECTIONS

- A. Testing and inspection shall be in accordance with DSA Form 103 (or current version)
- B. Slump Test
ASTM C 143
- C. Concrete Tests

Testing agency shall test concrete used in the work per the following paragraphs:

- (1) Compressive Strength:
 - (a) Minimum number of tests required: One (1) set of three (3) cylinders for each 100 cubic yards (Sec. 2604(h) 01) of concrete or major fraction thereof, placed in one (1) day. See Title 24, Section 2605(g).

- (b) Two cylinders of each set shall be tested at twenty-eight (28) days. One (1) cylinder shall be held in reserve and tested only when directed by the Architect or District.
- (c) Concrete shall test the minimum ultimate compressive strength in twenty-eight 28 days, as specified on the structural drawings.
- (d) In the event that the twenty-eight (28) day test falls below the minimum specified strength, the effective concrete in place shall be tested by taking cores in accordance with UBC Standard No. 26-13 and tested as required for cylinders.
- (e) In the event that the test on core specimens falls below the minimum specified strength, the concrete will be deemed defective and shall be removed and replaced upon such direction of the Architect, and in a manner acceptable to the Division of the State Architect.

D. Reinforcing, Steel

PART 3 - EXECUTION Not Used.

END OF DOCUMENT

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Administrative and procedural requirements related to inspections, tests, and related quality control procedures required to be performed by the Contractor and that facilitate the Contractor's compliance with the Contract Documents.

1.2 RELATED REQUIREMENTS

- A. Section 01 3300, Submittal Procedures; submission of manufacturers' instructions and certificates.
- B. Section 01 4523, Testing and Inspecting Services, and DSA 103; Special Tests and Inspections required by authorities having jurisdiction and are the responsibility of Owner.
- C. Section 01 7700, Closeout Procedures.
- D. Specific requirements for testing, inspections, mockups, and other quality control requirements as described in the various Sections of the Specifications.

1.3 DEFINITIONS

- A. Experienced: When used with an entity or individual, and unless otherwise specified, means having successfully completed a minimum of three previous projects similar in nature, size, and extent to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.
- B. Field Quality-Control Tests: Tests and inspections that are performed on-site for installation of the Work and for completed Work.
- C. Installer/Applicator/Erector: Contractor or another entity engaged by Contractor as an employee, subcontractor, or sub-subcontractor, to perform a particular construction operation, including installation, erection, application, assembly, and similar operations.
- D. Mockups: Full-size, physical assemblies that are constructed on-site and in-place mockups to demonstrate aesthetic effects and, where indicated, qualities of materials and execution, and to review construction, coordination, interface, testing, and operation of various building components. Mockups are not samples.
- E. Tests: Procedures intended to establish the quality, performance, or reliability of a product or system conducted by a qualified Testing Agency.
- F. Source Quality-Control Tests: Tests and inspections related to materials manufactured or fabricated away from the jobsite that will be incorporated into the work.

FIELD QUALITY CONTROL PROCEDURES
SECTION 01 4516
3595001

- G. Testing Agency: An independent entity engaged to perform specific tests, inspections, or both, is qualified to operate in California, and meets the additional requirements specified.
 - 1. Testing laboratory shall mean the same as Testing Agency.
- H. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.
- I. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that actual products incorporated into the Work and completed construction comply with requirements. Contractor's quality-control services do not include Contract administration activities performed by Architect.

1.4 REFERENCES AND STANDARD SPECIFICATIONS

- A. General:
 - 1. The Contract Documents contain references to various standard specifications, codes, practices, and requirements for materials, work quality, installation, inspections, and tests published and issued by the organizations, societies, and associations.
 - 2. Contractor shall obtain its own copies of required specified referenced publications.
 - 3. The specification or standard referred to shall have full force and effect as though printed in these Specifications.
 - 4. When the effective date of a reference standard is not specified, it shall be understood that the current edition or latest revision thereof and any amendments or supplements thereto in effect on the date of the DSA approval, shall govern the Work.
 - 5. The contractual relationships, duties, and responsibilities of the parties in Contract or those of the Architect shall not be altered from the Contract Documents by mention or inference otherwise in any reference document.
- B. Products or workmanship specified by association, trade, or other consensus standards shall comply with requirements of the referenced standard or specification except when more rigid requirements are specified or are required by applicable codes.
- C. Conflicting Requirements:
 - 1. If compliance with two or more standards or requirements are specified and the standards or requirements establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement.
 - 2. Refer conflicting requirements that are different, but apparently equal, to Architect for direction before proceeding.

1.5 ADMINISTRATIVE REQUIREMENTS

- A. Submittal Procedures:
 - 1. Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
 - 2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.

1.6 INFORMATIONAL SUBMITTALS

- A. Schedule of Tests and Inspections.
- B. Field Superintendent's Quality Control Responsibilities
- C. Procedures for inspection prior to subsequent Work or cover up.
- D. Qualifications of Contractor's Testing Agencies.
- E. Certified copies of Reports and Documents.

1.7 CLOSEOUT SUBMITTALS

- A. Permits, Licenses, and Certificates: Copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents established for compliance with standards and regulations bearing on performance of the Work.
- B. Test and Inspection Log including final record for each test and inspection as specified in Part 3 and in accordance with Section 01 7839, Project Record Documents.

1.8 REPORTS AND DOCUMENTS

- A. Test and Inspection Reports: Prepare and submit certified written reports where specified in the Specification Sections. Include the following:
 - 1. Date of issue.
 - 2. Project title and number.
 - 3. Name, address, and telephone number of testing agency.
 - 4. Dates and locations of samples and tests or inspections.
 - 5. Names of individuals making tests and inspections.
 - 6. Description of the Work and test and inspection method.
 - 7. Identification of product and Specification Section.
 - 8. Complete test or inspection data.
 - 9. Test and inspection results and an interpretation of test results.
 - 10. Record of temperature and weather conditions at time of sample taking and testing and inspecting.

FIELD QUALITY CONTROL PROCEDURES
SECTION 01 4516
3595001

11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
12. Name and signature of laboratory inspector.
13. Recommendations on retesting and re-inspecting.

1.9 QUALITY ASSURANCE

- A. Minimum Quantity or Quality Levels:
1. The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements.
 2. Refer uncertainties to Architect for a decision before proceeding.
- B. Use of trade-specific terminology in referring to a trade or entity does not require that certain construction activities be performed by accredited or unionized individuals, or that requirements specified apply exclusively to specific trade(s).
- C. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce Work of specified quality.
- D. Correct conditions or workmanship not in conformance with specified standards or quality. Do so immediately after non-conformance item is discovered or within a reasonable time frame agreed upon with Construction Manager.
- E. Comply with manufacturers' instructions, including each step in sequence. Should manufacturers' instructions conflict with Contract Documents, request clarification from the Architect before proceeding.
- F. Comply with specified standards as minimum quality for the Work, except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.
- G. Perform Work by persons qualified to produce required and specified quality.
- H. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, or disfigurement.
- I. Upon delivery to the jobsite, materials and products shall be inspected for compliance with the Project Specifications.
1. Nonconforming materials, products, equipment, hardware, tools and/or safety devices shall be removed immediately from the general work area and stored within a secured area approved by the Owner as "NON CONFORMING MATERIALS AREA" to ensure that defective or nonconforming materials are not incorporated into or used on the project
 2. Materials or products shall not be removed from the designated area until they are deemed by the Architect to be in compliance, or until they are modified or fixed to

meet the project specifications, or until they are removed from the jobsite for the purposes of disposal or shipment back to the manufacturer.

1.10 CONTRACTORS TESTING AGENCY

- A. Qualifications: At Contractor's expense, provide an independent testing laboratory nationally recognized according to 29 CFR 1910.7 and accredited according to NIST's National Voluntary Laboratory Accreditation Program (NVLAP,) or other independent agency with the experience and capability to conduct testing and inspecting indicated, documented according to ASTM E329; with additional qualifications specified in individual Sections; and, where required, that is acceptable to authorities having jurisdiction.
- B. Testing Agency shall cooperate with Architect, Construction Manager, Owner's Project Inspector, and Contractor in performance of duties.
- C. Testing Agency shall provide qualified personnel to perform required tests and inspections.
- D. Testing Agency shall not be authorized to release, revoke, alter, or increase the Contract Document requirements, approve or accept any portion of the Work, or perform any duties of Contractor.

1.11 TESTS AND INSPECTIONS

- A. Preconstruction Testing: Where preconstruction testing is specified to verify performance requirements, comply with the following as applicable:
 - 1. Contractor Responsibilities:
 - a. Provide test specimens representative of proposed products and construction.
 - b. Submit specimens in a timely manner with sufficient time for testing and analyzing results to prevent delaying the Work.
 - c. Provide sizes and configurations of test assemblies, mockups, and laboratory mockups to adequately demonstrate capability of products to comply with performance requirements.
 - d. Build site-assembled test assemblies and mockups using installers who will perform same tasks for Project.
 - e. Build laboratory mockups at testing facility using personnel, products, and methods of construction indicated for the completed Work.
 - f. When testing is complete, remove test specimens, assemblies, and mockups; do not reuse products on Project unless approved by Architect in writing.
- B. Tests and Inspections indicated in individual Specification Sections shall be conducted by a qualified Testing Agency. The responsibilities of the Testing Agency shall be as follows:

FIELD QUALITY CONTROL PROCEDURES
SECTION 01 4516
3595001

1. Verifying that manufacturer maintains detailed fabrication and quality-control procedures and reviews the completeness and adequacy of those procedures to perform the Work.
 2. Notifying Architect, Construction Manager, Owner's Project Inspector, and Contractor promptly of irregularities and deficiencies observed in the Work during performance of its services.
 3. Submit a certified written report of each test, inspection, and similar quality-control service to Architect, Construction Manager, and Owner's Project Inspector with copy to Contractor and to DSA.
 4. Submit a final report of tests and inspections at Substantial Completion which includes a list of unresolved deficiencies.
 5. Interpret tests and inspections and stating in each report whether tested and inspected work complies with or deviates from the Contract Documents.
 6. Retest and reinspect corrected work.
- C. Monitoring and Documentation: Contractor shall maintain testing and inspection reports including log of approved and rejected results as specified in Part 3.
1. Include work Architect has indicated as nonconforming or defective.
 2. Indicate corrective actions taken to bring nonconforming work into compliance with requirements.
 3. Comply with requirements of the California Division of the State Architect (DSA).

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 NOTIFICATIONS

- A. Contractor shall provide the following notifications;
1. Owner's Project Inspector writing:
 - a. 24 hours in advance of starting new Work
 - b. 24 hours in advance of each test or inspection
 2. 48 hours' prior notice, minimum, to the Testing Agency for required tests and inspections.

3.2 TEST AND INSPECTION FIELD BINDER

- A. Contractor shall maintain in the Field Office a Test and Inspection Field Binder that includes a hard copy of the following documents:
1. Approved Quality Control Plan.
 2. Specification Sections that apply to the respective portions of work.
 3. RFI's, CCD's or other approved document that changes the work.

4. Manufacturer's Installation Instructions (MII).
5. Specific details of the Work as requested by the Inspector.
6. Test and Inspection Log.

3.3 TEST AND INSPECTION LOG

- A. Prepare and maintain a record of tests and inspections using an electronic spreadsheet.
- B. Include the following information:
 1. Date test or inspection was conducted.
 2. Description of the Work tested or inspected.
 3. List pertinent detail/sheet number.
 4. List pertinent Specification Section.
 5. Attach manufacturer's installation inspections if applicable.
 6. List and attach RFI's, ASI's or CCD's affecting the Work.
 7. Date Inspector verified work is acceptable.
- C. Final record for each test and inspection shall be submitted on Contractors letterhead and include the name of the responsible person to verify Work was in accordance with the approved Contract Documents.

3.4 MANUFACTURERS' FIELD SERVICES

- A. When specified in respective Specification Sections, Contractor shall require supplier or manufacturer to provide qualified personnel to observe field conditions, conditions of surfaces and installation, quality of workmanship, start-up of equipment, testing, adjusting and balancing of equipment as applicable, and to make appropriate recommendations. Contractor is responsible for proper notification of manufacturer's representative before installation of applicable work and for obtaining necessary inspection certificate stating that installation was observed and approved.
- B. Product Performance Verification: The supplier of products specified based on performance criteria shall, at the request of the Agency, inspect the installed product and certify conformance of the product to specified criteria under the installed conditions.
- C. Manufacturer's representative shall submit written report to the Architect listing observations and recommendations.

3.5 TOLERANCES - GENERAL

- A. Monitor tolerance control of installed products or portions to produce acceptable Work. Do not permit tolerances to accumulate.
- B. Comply with manufacturers' tolerances. Should manufacturers' tolerances conflict with Contract Documents, request clarification from Architect before proceeding.
- C. Adjust products to appropriate dimensions; position before securing products in place.

FIELD QUALITY CONTROL PROCEDURES
SECTION 01 4516
3595001

3.6 DIMENSIONING AND TOLERANCES FOR ACCESSIBILITY

- A. While it is recognized that construction practices generally permit a level of reasonable dimensional tolerance, the installation of items subject to compliance with the Americans with Disabilities Act Accessibility Guidelines and Chapter 11B of the California Building Code, typically does not allow such tolerances. Therefore, these dimensions are to be considered absolute and will be strictly enforced. Items found to be out of tolerance may require modification and/or replacement at Contractor's expense.

3.7 REPAIR AND PROTECTION

- A. On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.
 - 1. Provide materials and comply with installation requirements specified in other Specification Sections or matching existing substrates and finishes.
 - 2. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible. Comply with the Contract Document requirements for cutting and patching in Section 01 7329, Cutting and Patching.
- B. Protect construction exposed by or for quality-control service activities.
- C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

END OF SECTION

p:\sacramento\3595 tracy unified school district\001-000_villalovoz es new shade structures\08 specifications\06 spec\04 final\freiler - shade struct\01 4516_field quality control procedures.docx
Last Updated: August 28, 2020

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Requirements for Testing Laboratory.
 - 2. Contractor's responsibilities for facilitation of Testing and Inspections.

1.2 RELATED SECTIONS AND DOCUMENTS

- A. Geologic Hazards & Soils Report.
- B. DSA 103 - Structural Test & Inspections List.
- C. Section 13 3423, Relocatable Buildings.
- D. Division 23, Mechanical Work - Testing, adjusting, and balancing of systems.
- E. Section 31 0000, Earthwork.
- F. Individual Specification Sections: Inspections and tests required, and standards for testing.

1.3 REFERENCES

- A. California Administrative Code (CAC), edition as noted on the drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Building Code (CBC), edition as noted on the drawings, as adopted by the California Division of the State Architect (DSA).

1.4 SELECTION AND PAYMENT

- A. Testing laboratory shall be approved by both the Architect and the Division of the State Architect.
- B. Owner will employ and pay for services of an independent testing laboratory to perform specified inspection and testing. Retesting costs for failed tests will be the Contractors responsibility and will be back-charged against the contract.
- C. Under provisions for Relocatable Building construction, Owner limits his exposure to in-plant inspection and testing costs. Refer to other Specification Sections related to such specific construction.
- D. Employment of testing laboratory shall in no way relieve Contractor of obligation to perform work in accordance with requirements of Contract Documents.

TESTING AND INSPECTION SERVICES

SECTION 01 4523

3595001

1.5 LABORATORY REPORTS

- A. After each inspection and test, promptly submit two copies of laboratory report to Owner, Architect, Contractor and DSA.
- B. Include:
 - 1. Date of issue,
 - 2. DSA Application and File numbers,
 - 3. Project title and number,
 - 4. Name of inspector,
 - 5. Date and time of sampling or inspection,
 - 6. Identification of product and Specification Section,
 - 7. Location in the Project,
 - 8. Type of inspection or test,
 - 9. Date of test,
 - 10. Results of test,
 - 11. Conformance with Contract Documents.
- C. When requested by Architect, provide interpretation of test results.

1.6 LIMITS ON TESTING LABORATORY AUTHORITY

- A. Laboratory may not release, revoke, alter or enlarge on requirements of Contract Documents.
- B. Laboratory may not approve or accept any portion of the work.
- C. Laboratory may not assume any duties of Contractor.
- D. Laboratory has no authority to stop the work.

1.7 CONTRACTOR RESPONSIBILITIES

- A. Deliver to laboratory at designated location, adequate samples of materials proposed to be used which require testing, along with proposed mix designs. Allow reasonable time for review and testing.
- B. Arrange for, and coordinate with, laboratory for all required testing and inspection. Provide adequate notice, in advance, for proper scheduling and processing of testing. The Inspector will not be responsible for scheduling or arranging for testing and inspection services.
- C. Cooperate with laboratory personnel, and provide access to the work and to manufacturer's facilities.
- D. Provide incidental labor and facilities to provide access to work to be tested, to obtain and handle samples at the site or at the source of products to be tested, to facilitate tests and inspections, storage and curing of test samples.

TESTING AND INSPECTION SERVICES

SECTION 01 4523

3595001

- E. Notify Architect, Inspector, Structural Engineer (when applicable) and laboratory 24 hours prior to expected time for operations requiring inspection and testing services.

END OF SECTION

*p:\sacramento\3595 tracy unified school district\001-000_villalovoz es new shade structures\08 specifications\06 spec\04 final\freiler
- shade struct\01 4523_testing and inspection services.docx
Last Updated: December 16, 2021*

TEMPORARY FACILITIES AND CONTROLS

PART 1 – GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions;
- B. Special Conditions;
- C. Site Standards; and
- D. Construction Waste Management and Disposal.

1.02 TEMPORARY UTILITIES:

A. Electric Power and Lighting:

- (1) Contractor will pay for power during the course of the Work. To the extent power is available in the building(s) or on the Site, Contractor may use the District's existing utilities by making prearranged payments to the District for the utilities used by Contractor and all Subcontractors. Contractor shall be responsible for providing temporary facilities required to deliver that power service from its existing location in the building(s) or on the Site to point of intended use.
- (2) Contractor shall verify characteristics of power available in building(s) or on the Site. Contractor shall take all actions required to make modifications where power of higher voltage or different phases of current are required. Contractor shall be fully responsible for providing that service and shall pay all costs required therefor.
- (3) Contractor shall furnish, wire for, install, and maintain temporary electrical lights wherever it is necessary to provide illumination for the proper performance and/or observation of the Work: a minimum of 20 foot-candles for rough work and 50 foot-candles for finish work.
- (4) Contractor shall be responsible for maintaining existing lighting levels in the project vicinity should temporary outages or service interruptions occur.

B. Water:

- (1) Contractor shall pay for water used during the course of the Work. Contractor shall coordinate and pay for installation or use of water meter in compliance with local water agency requirements. To the

extent water is then available in the building(s) or on the Site, Contractor may use the District's existing utilities by making prearranged payments to the District for the utilities used by Contractor and all Subcontractors. Contractor shall be responsible for providing temporary facilities required to deliver such utility service from its existing location in the building(s), on the Site, or other location approved by the local water agency, to point of intended use.

- (2) Contractor shall use backflow preventers on water lines at point of connection to District's water supply. Backflow preventers shall comply with requirements of Uniform Plumbing Code.
- (3) Contractor shall make potable water available for human consumption.

C. Sanitary Facilities:

- (1) Contractor shall provide sanitary temporary facilities in no fewer numbers than required by law and such additional facilities as may be directed by the Inspector for the use of all workers. The facilities shall be maintained in a sanitary condition at all times and shall be left at the Site until removal is directed by the Inspector or Contractor completes all other work at the Site.
- (2) Use of toilet facilities in the Work under construction shall not be permitted except by consent of the Inspector and the District.

D. Fire Protection:

- (1) Contractor shall provide and maintain fire extinguishers and other equipment for fire protection. Such equipment shall be designated for use for fire protection only and shall comply with all requirements of the California Fire, State Fire Marshall and/or its designee.
- (2) Where on-site welding and burning of steel is unavoidable, Contractor shall provide protection for adjacent surfaces.

E. Trash Removal:

- (1) Contractor shall provide trash removal on a timely basis. Under no circumstance shall Contractor use District trash service.

F. Field Office:

- (1) If Contractor chooses to provide a field office, it shall be an acceptable construction trailer that is well-lit and ventilated. The construction trailer shall be equipped with shelves, desks, filing cabinet, chairs, and such other items of equipment needed. Trailer and equipment are the property of the Contractor and must be removed from the Site upon completion of the Work.
- (2) Contractor shall provide any additional electric lighting and power required for the trailer. Contractor shall make adequate provisions for heating and cooling as required.

1.03 CONSTRUCTION AIDS:

- A. Plant and Equipment:
 - (1) Contractor shall furnish, operate, and maintain a complete plant for fabricating, handling, conveying, installing, and erecting materials and equipment; and for conveyances for transporting workers. Include elevators, hoists, debris chutes, and other equipment, tools, and appliances necessary for performance of the Work.
 - (2) Contractor shall maintain plant and equipment in safe and efficient operating condition. Damages due to defective plant and equipment, and uses made thereof, shall be repaired by Contractor at no expense to the District.
- B. None of the District's tools and equipment shall be used by Contractor for the performance of the Work.

1.04 BARRIERS AND ENCLOSURES:

- A. Contractor shall obtain the District's written permission for locations and types of temporary barriers and enclosures, including fire-rated materials proposed for use, prior to their installation.
- B. Contractor shall provide and maintain temporary enclosures to prevent public entry and to protect persons using other buildings and portions of the Site and/or Premises, the public, and workers. Contractor shall also protect the Work and existing facilities from the elements, and adjacent construction and improvements, persons, and trees and plants from damage and injury from demolition and construction operations.
- C. Contractor shall provide site access to existing facilities for persons using other buildings and portions of the Site, the public, and for deliveries and other services and activities.
- D. Tree and Plant Protection:
 - (1) Contractor shall preserve and protect existing trees and plants on the Premises that are not designated or required to be removed, and those adjacent to the Premises.
 - (2) Contractor shall provide barriers to a minimum height of 4'-0" around drip line of each tree and plant, around each group of trees and plants, as applicable, in the proximity of demolition and construction operations, or as denoted on the Plans.
 - (3) Contractor shall not park trucks, store materials, perform Work or cross over landscaped areas. Contractor shall not dispose of paint thinners, water from cleaning, plastering or concrete operations, or other deleterious materials in landscaped areas, storm drain systems, or sewers. Plant materials damaged as a result of the performance of the Work shall, at the option of the District and at Contractor's expense, either be replaced with new plant materials equal in size to

those damaged or by payment of an amount representing the value of the damaged materials as determined by the District.

- (4) Contractor shall remove soil that has been contaminated during the performance of the Work by oil, solvents, and other materials which could be harmful to trees and plants, and replace with good soil, at Contractor's expense.
- (5) Excavation around Trees:
 - (a) Excavation within drip lines of trees shall be done only where absolutely necessary and with written permission from the District.
 - (b) Where trenching for utilities is required within drip lines, tunneling under and around roots shall be by hand digging and shall be approved by the District. Main lateral roots and taproots shall not be cut. All roots 2 inches in diameter and larger shall be tunneled under and heavily wrapped with wet burlap so as to prevent scarring or excessive drying. Smaller roots that interfere with installation of new work may be cut with prior approval by the District. Roots must first be cut with a Vermeer, or equivalent, root cutter prior to any trenching.
 - (c) Where excavation for new construction is required within drip line of trees, hand excavation shall be employed to minimize damage to root system. Roots shall be relocated in backfill areas wherever possible. If encountered immediately adjacent to location of new construction, roots shall be cut approximately 6 inches back from new construction.
 - (d) Approved excavations shall be carefully backfilled with the excavated materials approved for backfilling. Backfill shall conform to adjacent grades without dips, sunken areas, humps, or other surface irregularities. Do not use mechanical equipment to compact backfill. Tamp carefully using hand tools, refilling and tamping until Final Acceptance as necessary to offset settlement.
 - (e) Exposed roots shall not be allowed to dry out before permanent backfill is placed. Temporary earth cover shall be provided, or roots shall be wrapped with four layers of wet, untreated burlap and temporarily supported and protected from damage until permanently relocated and covered with backfill.
 - (f) Accidentally broken roots should be sawed cleanly 3 inches behind ragged end.

1.05 SECURITY:

The Contractor shall be responsible for project security for materials, tools, equipment, supplies, and completed and partially completed Work.

1.06 TEMPORARY CONTROLS:

A. Noise Control:

- (1) Contractor acknowledges that adjacent facilities may remain in operation during all or a portion of the Work period, and it shall take all reasonable precautions to minimize noise as required by applicable laws and the Contract Documents.
- (2) Notice of proposed noisy operations, including without limitation, operation of pneumatic demolition tools, concrete saws, and other equipment, shall be submitted to the District a minimum of forty-eight (48) hours in advance of their performance.

B. Noise and Vibration:

- (1) Equipment and impact tools shall have intake and exhaust mufflers.
- (2) Contractor shall cooperate with District to minimize and/or cease the use of noisy and vibratory equipment if that equipment becomes objectionable by its longevity.

C. Dust and Dirt:

- (1) Contractor shall conduct demolition and construction operations to minimize the generation of dust and dirt, and prevent dust and dirt from interfering with the progress of the Work and from accumulating in the Work and adjacent areas including, without limitation, occupied facilities.
- (2) Contractor shall periodically water exterior demolition and construction areas to minimize the generation of dust and dirt.
- (3) Contractor shall ensure that all hauling equipment and trucks carrying loads of soil and debris shall have their loads sprayed with water or covered with tarpaulins, and as otherwise required by local and state ordinance.
- (4) Contractor shall prevent dust and dirt from accumulating on walks, roadways, parking areas, and planting, and from washing into sewer and storm drain lines.

D. Water:

- (1) Contractor shall not permit surface and subsurface water, and other liquids, to accumulate in or about the vicinity of the Premises. Should accumulation develop, Contractor shall control the water or other liquid, and suitably dispose of it by means of temporary pumps, piping, drainage lines, troughs, ditches, dams, or other methods.

E. Pollution:

- (1) No burning of refuse, debris, or other materials shall be permitted on or in the vicinity of the Premises.
- (2) Contractor shall comply with applicable regulatory requirements and anti-pollution ordinances during the conduct of the Work including, without limitation, demolition, construction, and disposal operations.

F. Lighting:

- (1) If portable lights are used after dark, all light must be located so as not to direct light into neighboring property.

1.07 PUBLICITY RELEASES:

- A. Contractor shall not release any information, story, photograph, plan, or drawing relating information about the Project to anyone, including press and other public communications medium, including, without limitation, on website(s) without the written permission of the District.

PART 2 – PRODUCTS Not used.

PART 3 – EXECUTION Not used.

END OF DOCUMENT

CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions;
- B. Special Conditions; and
- C. Temporary Facilities and Controls.

1.02 SECTION INCLUDES:

- A. Administrative and procedural requirements for the following:
 - (1) Salvaging non-hazardous construction waste.
 - (2) Recycling non-hazardous construction waste.
 - (3) Disposing of non-hazardous construction waste.

1.03 DEFINITIONS:

- A. Construction Waste: Building and site improvement materials and other solid waste resulting from construction, remodeling, renovation, or repair operations. Construction waste includes packaging.
- B. Demolition Waste: Building and site improvement materials resulting from demolition or selective demolition operations.
- C. Disposal: Removal off-site of demolition and construction waste and subsequent sale, recycling, reuse, or deposit in landfill or incinerator acceptable to authorities having jurisdiction.
- D. Recycle: Recovery of demolition or construction waste for subsequent processing in preparation for reuse.
- E. Salvage: Recovery of demolition or construction waste and subsequent sale or reuse in another facility.
- F. Salvage and Reuse: Recovery of demolition or construction waste and subsequent incorporation into the Work.

1.04 PERFORMANCE REQUIREMENTS:

- A. General: Develop waste management plan that results in end-of Project rates for salvage/recycling of sixty-five percent (65%) by weight (or by volume, but not a combination) of total waste generated by the Work.

1.05 SUBMITTALS:

- A. Waste Management Plan: Submit waste management plan within 30 days of date established for commencement of the Work.
- B. Waste Reduction Progress Reports: Concurrent with each Application for Payment, submit copies of report. Include the following information:
 - (1) Material category.
 - (2) Generation point of waste.
 - (3) Total quantity of waste in tons or cubic yards.
 - (4) Quantity of waste salvaged, both estimated and actual in tons or cubic yards.
 - (5) Quantity of waste recycled, both estimated and actual in tons or cubic yards.
 - (6) Total quantity of waste recovered (salvaged plus recycled) in tons or cubic yards.
 - (7) Total quantity of waste recovered (salvaged plus recycled) as a percentage of total waste.
- C. Waste Reduction Calculations: Before request for final payment, submit copies of calculated end-of-Project rates for salvage, recycling, and disposal as a percentage of total waste generated by the Work.
- D. Records of Donations: Indicate receipt and acceptance of salvageable waste donated to individuals and organizations. Indicate whether organization is tax exempt.
- E. Records of Sales: Indicate receipt and acceptance of salvageable waste sold to individuals and organizations. Indicate whether organization is tax exempt.
- F. Recycling and Processing Facility Records: Indicate receipt and acceptance of recyclable waste by recycling and processing facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.
- G. Landfill and Incinerator Disposal Records: Indicate receipt and acceptance of waste by landfills and incinerator facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.

- H. Qualification Data: For Waste Management Coordinator.
- I. Submittal procedures and quantities are specified in Document 01 33 00.

1.06 QUALITY ASSURANCE:

- A. Waste Management Coordinator Qualifications: LEED Accredited Professional by U.S. Green Building Council.
- B. Regulatory Requirements: Comply with hauling and disposal regulations of authorities having jurisdiction.
- C. Waste Management Conference: Conduct conference at Project site to comply with requirements. Review methods and procedures related to waste management including, but not limited to, the following:
 - (1) Review and discuss waste management plan including responsibilities of Waste Management Coordinator.
 - (2) Review requirements for documenting quantities of each type of waste and its disposition.
 - (3) Review and finalize procedures for materials separation and verify availability of containers and bins needed to avoid delays.
 - (4) Review procedures for periodic waste collection and transportation to recycling and disposal facilities.
 - (5) Review waste management requirements for each trade.

1.07 WASTE MANAGEMENT PLAN:

- A. General: Develop plan consisting of waste identification, waste reduction work plan, and cost/revenue analysis. Indicate quantities by weight or volume, but use same units of measurement throughout waste management plan.
- B. Waste Identification: Indicate anticipated types and quantities of site-clearing and construction waste generated by the Work. Include estimated quantities and assumptions for estimates.
- C. Waste Reduction Work Plan: List each type of waste and whether it will be salvaged, recycled, or disposed of in landfill or incinerator. Include points of waste generation, total quantity of each type of waste, quantity for each means of recovery, and handling and transportation procedures.
 - (1) Salvaged Materials for Reuse: For materials that will be salvaged and reused in this Project, describe methods for preparing salvaged materials before incorporation into the Work.

- (2) Salvaged Materials for Sale: For materials that will be sold to individuals and organizations, include list of their names, addresses, and telephone numbers.
- (3) Salvaged Materials for Donation: For materials that will be donated to individuals and organizations, include list of their names, addresses, and telephone numbers.
- (4) Recycled Materials: Include list of local receivers and processors and type of recycled materials each will accept. Include names, addresses, and telephone numbers.
- (5) Disposed Materials: Indicate how and where materials will be disposed of. Include name, address, and telephone number of each landfill and incinerator facility.
- (6) Handling and Transportation Procedures: Include method that will be used for separating recyclable waste including sizes of containers, container labeling, and designated location on Project site where materials separation will be located.

PART 2 - PRODUCTS Not Used.

PART 3 - EXECUTION

3.01 PLAN IMPLEMENTATION:

- A. General: Implement approved waste management plan. Provide handling, containers, storage, signage, transportation, and other items as required to implement waste management plan during the entire duration of the Contract.
 - (1) Comply with Document 01 50 00 for operation, termination, and removal requirements.
- B. Training: Train workers, subcontractors, and suppliers on proper waste management procedures, as appropriate for the Work occurring at Project site.
 - (1) Distribute waste management plan to everyone concerned within 3 days of submittal return.
 - (2) Distribute waste management plan to entities when they first begin work on site. Review plan procedures and locations established for salvage, recycling, and disposal.
- C. Site Access and Temporary Controls: Conduct waste management operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.

- (1) Designate and label specific areas of Project site necessary for separating materials that are to be salvaged, recycled, reused, donated, and sold.
- (2) Comply with Document 01 50 00 for controlling dust and dirt, environmental protection, and noise control.

3.02 RECYCLING CONSTRUCTION WASTE:

- A. General: Recycle paper and beverage containers used by on-site workers.
- B. Recycling Incentives: Revenues, savings, rebates, tax credits, and other incentives received for recycling waste materials shall accrue to the Contractor.
- C. Procedures: Separate recyclable waste from other waste materials, trash, and debris. Separate recyclable waste by type at Project site to the maximum extent practical.
 - (1) Provide appropriately marked containers or bins for controlling recyclable waste until they are removed from Project Site. Include list of acceptable and unacceptable materials at each container and bin.
 - (a) Inspect containers and bins for contamination and remove contaminated materials if found.
 - (2) Stockpile processed materials on site without intermixing with other materials. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
 - (3) Stockpile materials away from construction area. Do not store within drip line of remaining trees.
 - (4) Store components off the ground and protect from the weather.
 - (5) Remove recyclable waste off District property and transport to recycling receiver or processor.
- D. Packaging:
 - (1) Cardboard and Boxes: Break down packaging into flat sheets. Bundle and store in a dry location.
 - (2) Polystyrene Packaging: Separate and bag material.
 - (3) Pallets: As much as possible, require deliveries using pallets to remove pallets from Project Site. For pallets that remain on Site, break down pallets into component wood pieces and comply with requirements for recycling wood.
 - (4) Crates: Break down crates into component wood pieces and comply with requirements for recycling wood.

- E. Site-Clearing Wastes: Chip brush, branches, and trees on site.
- F. Wood Materials:
 - (1) Clean Cut-Offs of Lumber: Grind or chip into small pieces.
 - (2) Clean Sawdust: Bag sawdust that does not contain painted or treated wood.

3.03 DISPOSAL OF WASTE:

- A. General: Except for items or materials to be salvaged, recycled, or otherwise reused, remove waste materials from Project Site and legally dispose of them in a landfill or incinerator acceptable to authorities having jurisdiction.
 - (1) Except as otherwise specified, do not allow waste materials that are to be disposed of accumulate on site.
 - (2) Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
- B. Burning: Do not burn waste materials.
- C. Disposal: Transport waste materials off District property and legally dispose of them.

END OF DOCUMENT

FIELD OFFICES

PART 1 – GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions;
- B. Special Conditions; and
- C. Temporary Facilities and Controls.

1.02 SECTION INCLUDES:

- A. Requirements for Field Offices and Field Office Trailers.

1.03 SUMMARY:

- A. General: Contractor shall provide District's Field Office Trailer and contents, for District's use exclusively, during the term of the Contract.
- B. Property: Trailer, furniture, furnishings, equipment, and the like, supplied by the Contractor with the Office Trailer shall remain the property of the Contractor; District property items installed, delivered, and the like by District within the Office Trailer will remain District's property.
- C. Modifications: District reserves the right to modify the trailer or contents, or both, as may be deemed proper by District.
- D. Condition: Trailer and contents shall be clean, neat, substantially finished, in good, proper, and safe condition for use, operation, and the like; the trailer and contents shall not be required to be new.
- E. Installation Timing: Provide safe, fully furnished, functional, proper, complete, and finished trailer properly ready for entire use, within fourteen (14) calendar days of District's notification of the issuance of Notice to Proceed.

1.04 SUBMITTALS:

- A. General: Submit submittals to District in quantity, format, type, and the like, as specified herein.
- B. Office Trailer Data: One (1) copy of manufacturer's descriptive data, technical descriptions, regulatory compliance, industry standards, installation, removal, and maintenance instructions.

- C. Equipment Data: Two (2) copies of manufacturer data for each type of equipment, if directed by District.
- D. Furniture and Furnishings Data: Two (2) copies of manufacturer data for each type of equipment, if directed by District.
- E. Plans: One (1) reproducible copy of appropriately scaled plans of trailer layout. Plans shall include, but not be limited to: lighting; furniture; equipment; telephone and electrical outlets; and the like.
- F. Product Samples: One (1) complete and entire unit of each type, if directed by District.

1.05 QUALITY ASSURANCE

- A. Standards: In the event that provisions of codes, regulations, safety orders, Contract Documents, referenced manufacturer's specifications, manufacturer's instructions, industry standards, and the like, are in conflict, the more restrictive and higher quality shall govern.
- B. Installer: Installer or Installers engaged by Contractor must have a minimum of five (5) years of documented and properly authenticated successful experience of specialization in the installation of the items or systems, or both, specified herein.
- C. Manufacturer: Contractor shall obtain products from nationally and industry recognized Manufacturer with five (5) years minimum, of immediately recent, continuous, documented and properly authenticated successful experience of specialization in the manufacture of the product specified herein.
- D. State Personnel Training: Provide proper training for maintenance and operations, including emergency procedures, and the like, as directed by District.
- E. Units: Shall be sound and free of defects, and shall not include any damage or defect that will impair the safety, installation, performance, or the durability of the entire Office Trailer and appurtenant systems.

1.06 REGULATORY REQUIREMENTS

- A. General: Work shall be executed in accordance with applicable Codes, Regulations, Statutes, Enactments, Rulings, Laws, each authority having jurisdiction, and including, but not limited to, Regulatory Requirements specified herein.
- B. California Building Standards Code ("CBSC").
- C. California Code of Regulations, Title 25, Chapter 3, Sub Chapter 2, Article 3 ("CCR").
- D. Coach Insignia: Trailer shall display California Commercial Coach Insignia; such insignia shall be deemed to show that the trailer is in accordance with the Construction and Fire Safety requirements of CCR.

PART 2 – PRODUCTS

2.01 FIELD OFFICE TRAILER

- A. General: Provide entire Field Office Trailer of type, function, operation, capacity, size, complete with controls, safety devices, accessories, and the like, for proper and durable installation. Partitions, walls, ceiling, and other interior and exterior surfaces shall be appropriately finished, including, but not limited to, trim, painting, wall base, floor covering, suspended or similar ceiling, and the like; provide systems, components, units, nuts, bolts, screws, anchoring devices, fastening devices, washers, accessories, adhesives, sealants, and other items of type, grade, and class required for the particular use, not identified but required for a complete, weather-tight, appropriately operating, and finished installation.
- B. Manufacturers: General Electric Capital Modular Space; The Space Place, Inc.; or equal.
- C. Program: Provide a wheel-mounted trailer with stairs, landings, platforms, ramps, and the like, in good, proper, safe, clean, and properly finished condition; with proper heavy duty locks, and other proper and effective security at all doors, windows, and the like. Trailer shall be maintained in good, proper, safe, clean, and properly finished condition during the Contract.
 - (1) Nominal Trailer Size: Four hundred eighty (480) square feet, minimum.
 - (2) Stairs, Platform: Properly finished stairs, platforms, and ramps.
 - (3) Doors: Two (2), three (3) foot wide exterior doors with locksets; finished ramp, steps, and entry platform at each exterior door.
 - (4) Keys: Submit five (5) keys for each door, window, furniture unit, and the like. There shall be no other key copies or originals available; each key shall be identified for District; and shall be labeled, or tagged
 - (5) Lighting: Sixty-five (65) foot-candles illumination minimum at any point, at thirty (30) inches above finished floor throughout from fluorescent light source, exclusively, or as directed by District.
 - (6) Electrical Outlets: One (1) duplex outlet evenly spaced every twelve (12) linear horizontal feet of wall face, and electrical service ready for use.

2.02 FIELD OFFICE TRAILER ITEMS

- A. General: Provide the Field Office Trailer with the following arranged into two (2) workstations:
 - (1) Desks: Two (2) desks: thirty-six (36) inches by sixty (60) inches; steel, laminated plastic top; locking, one (1) or two (2) file drawers single pedestal; steel; provide five (5) keys to District.

- (2) Tables: Two (2) tables; thirty-six (36) inches by sixty (60) inches; twenty-nine (29) inches high; steel, laminated plastic top tables; one (1) at each desk.
 - (3) Chairs: Two (2) chairs: swivel; steel; with seat cushion and arms; one (1) at each desk.
 - (4) Waste Baskets: Two (2) waste baskets, one at each desk.
- B. Furniture and Equipment: Provide in the space located to effect efficient and logical use.
- (1) File cabinet: One (1); four (4) drawer; lateral; steel locking.
 - (2) Plan Table: One (1) plan table: thirty-six (36) inches deep by seventy-two (72) inches wide by forty-two (42) inches high; adjustable; wood or steel; with lockable plan and pencil drawers.
 - (3) Drafting Stool: One (1) drafting stool; swiveling; steel; padded; adjustable; with footrest and casters.
 - (4) Bookshelf: One (1) bookshelf: thirty-six (36) inches deep by seventy-two (72) inches wide by forty-two (42) inches high; adjustable; wood or steel; with lockable plan and pencil drawer.
 - (5) Plan Rack: One (1) wheel mounted plan rack.
 - (6) Waste Baskets: One (1) large waste basket.
 - (7) Coat/Hat Hanger: Wall mounted with minimum capacity for four (4) garments and ten (10) hats.
 - (8) Document Management System: Shall include an integrated high-volume printer, copier, and facsimile machine, including stand, base, and storage cabinet; and shall include the following features:
 - (a) Type: Laser, dry electrostatic transfer, plain paper, digital, multi-function imaging system.
 - (b) Network: Ethernet or Token Ring network ready, Plug-and-Play.
 - (c) Print, send/receive facsimile from any connected workstation.
 - (d) Resolution: Six hundred (600) dots per inch by six hundred (600) dots per inch, minimum.
 - (e) Print Speed: Twenty (20) pages per minute, minimum.
 - (f) Copies: Twenty (20) copies per minute, minimum.
 - (g) Document Handler: Forty (40) sheet, minimum

- (h) Collator: Forty (40) bin, minimum, with stapling.
- (i) Duplexing: Capable.
- (j) Paper Size: Capable of handling paper sizes to eleven (11) inches by seventeen (17) inches.
- (k) Paper Cassettes: One (1) each for eight and one half (8.5) inches by eleven (11) inches, eight and one half (8.5) inches by fourteen (14) inches, and eleven (11) inches by seventeen (17) inches paper sizes; minimum two hundred fifty (250) sheets per cassette.
- (l) Reduction/Enlargement: Capable of reduction to twenty-five percent (25%) and enlargement to two hundred percent (200%).
- (m) Facsimile Electronic Storage: Capable of storing minimum of fifty (50) speed dial numbers, group faxing and broadcast faxing.
- (n) Facsimile Scanning: Capable of scanning into memory a minimum of one hundred (100) pages with maximum scan time of three (3) seconds per page.
- (o) Halftone: Sixty-four (64) levels.
- (p) Redial: Automatic and Manual.
- (9) Maintenance: Contractor shall purchase service agreements for each unit of equipment for the duration of the project plus two (2) months, and shall maintain all equipment in proper working condition. Service agreements shall include provision for replacement of toner cartridges and other items required to effect proper unit use. Service agreements shall also provide for:
 - (a) Unlimited Service Calls.
 - (b) Same Day Response.
 - (c) All parts, labor, preventative maintenance and mileage.
 - (d) All chemicals, such as toner, fixing agent, and the like.
 - (e) System training and setup.
- (10) Portable Toilets: Two (2); each shall include a urinal; each unit shall be a properly enclosed chemical unit conforming to ANSI Z4.3.
 - (a) Location: As directed by District.
 - (b) Maintenance: Maintain each unit and surrounding areas in a clean, hygienic and orderly manner, at all time. Empty, clean,

and sanitize each unit each day at a location and time as directed by District.

- (c) Removal: Relocate, or remove from the site, each Portable Toilet. Upon such directive by District, the Contractor shall forthwith relocate or remove each Portable Toilet and submit the affected areas to a condition which existed prior to the installation of each Portable Toilet, within three (3) calendar days, or as directed by District in writing, at no cost to District.

2.03 UTILITY AND SERVICES

- A. Telephone Service: Contractor shall provide and interface the entire telephone service, and shall properly and timely pay for telephone service for District's non-long-distance use.
- B. Electrical Service: Provide all proper connections and continuously pay for service for the duration of the Work.

2.04 FINISHES

- A. General: Manufacturer standard finish system over surfaces properly cleaned, pretreated, and prepared to obtain proper bond; all visible surfaces shall be coated.
- B. Finish: Color as selected by District from manufacturer standard palette.

PART 3 – EXECUTION

3.01 INSTALLATION

- A. General: Properly prepare area and affected items to receive the Work. Set Work accurately in location, alignment, and elevation; rigidly, securely, and firmly anchor to appropriate structure; install plumb, straight, square, level, true, without racking, rigidly anchored to proper solid blocking, substrate, and the like; provide appropriate type and quantity of reinforcements, fasteners, adhesives, self-adhesive and other tapes; lubricants, coatings, accessories, and the like, as required for a complete, structurally rigid, stable, sound, and appropriately finished installation, in accordance with manufacturer's published instructions, and as indicated. The more restrictive and higher quality requirement shall govern. Moving parts shall be properly secured, without binding, looseness, noise, and the like.
- B. Installation: Install in accordance with 25 CCR 3.2.3 and as directed by District; jack up trailer and level both ways; mount on proper concrete piers with all load off wheels; provide required tie down and accessories per Section 4368 of referenced CCR, and as directed by District.
- C. Rejected Work: Work, materials, unit, items, systems, and the like, not accepted by District shall be deemed rejected, and shall forthwith be removed and replaced with proper and new Work, materials, unit, items, systems, and the like at no cost to District.

- D. Standard: Comply with manufacturer's published instructions, or with instructions as shown or indicated; the more restrictive and higher quality requirement shall govern.
- E. Location: As directed by District.
- F. Fire Resistance: Construct and install in accordance with UL requirements.
- G. Maintenance: Contractor shall maintain trailer and adjacent areas in a safe, clean and hygienic condition throughout the duration of the Work, and as directed by District. Properly repair or replace furniture or other items, as directed by District. Properly remove unsafe, damaged, or broken furniture, or similar items, and replace with safe and proper items. Contractor shall pay cost of all services, repair, and maintenance, or replacement of each item.
- H. Janitorial Service: Provide professional janitorial services, including, but not limited to, trash, waste paper baskets, fill paper dispensers; clean and dust all furniture, files, and the like; sweep and mop resilient and similar flooring; and vacuum carpeting and similar flooring.
 - (1) Frequency: Two (2) times per week, minimum.
- I. Removal: Properly remove the Office Trailer and contents from the Site upon completion of the Contract, or as directed by District in writing. Forthwith properly patch and repair affected areas; replace damaged items with new items. Carefully and properly inventory, clean, pack, store, and protect District property; submit District property to District at a date, time and location as directed by District.

END OF DOCUMENT

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Protection for existing trees.
 - 2. Repair and replacement of damaged trees.

1.2 RELATED REQUIREMENTS

- A. Section 32 8000, Irrigation.
- B. Section 32 9000, Landscaping.

1.3 REFERENCES AND STANDARDS

- A. American National Standard Institute (ANSI) A300 Pruning Standards.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Submittal Procedures:
 - 1. Action Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
 - 2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.

1.5 ACTION SUBMITTALS

- A. Fenced Tree Protection Area Plan: Submit plan outlining trees listed by number to be protected and their groupings. Trees shall be grouped in their own Fenced Tree Protection Areas as shown in Drawings.
- B. Schedule of Activities Inside Tree Protection Area: Submit in writing a schedule, including any and all activity inside Fenced Tree Protection Areas. This schedule to include but not limited to the dates fences are initially installed, altered and dates of fence replacement. Intent of these provisions is that the Tree Protection Zones (TPZ) are fenced for the entire duration with only exceptions of short intervals or specifically defined construction activity needs. Revise schedule as directed.
- C. Mediation Plan: Submit mediation plan to keep existing trees and planting irrigated during construction.

1.6 CLOSEOUT SUBMITTALS

- A. Maintenance Plan: For replaced trees.

TEMPORARY TREE PROTECTION
SECTION 01 5639
3595001

PART 2 - PRODUCTS

2.1 GENERAL

- A. Use materials as specified; any deviation from the Specifications must first be approved by the Owner's Representative in writing.

2.2 MATERIALS

- A. Trunk Protection constructed of:
 - 1. 20-foot long 2x6 wood boards or length needed to protect the trunk if tree trunk is shorter than 20 feet in height.
 - 2. Metal wire. Gauge strong enough to tie the boards around the trunk of the tree.
- B. Tree Protection Zone Fencing:
 - 1. 6-foot-tall metal chain link construction fencing.
- C. Bark Mulch: Untreated, shredded cedar.

PART 3 - EXECUTION

3.1 GENERAL REQUIREMENTS FOR TREES BE RETAINED

- A. Maintain pre-existing moisture levels.
- B. Maintain areas inside the fenced tree protection area including lawn mowing, leaf removal, operation and repair of irrigation.
- C. Protect root systems from flooding, erosion, excessive watering and drying resulting from dewatering or other operations:
- D. Operations not Allowed:
 - 1. Run off or spillage of damaging materials in vicinity of root systems.
 - 2. Rinsing of tools or equipment under trees.
 - 3. Storage of materials, stockpile soil, park or drive vehicles within drip lines.
 - 4. Cutting, breaking skin or bark, or bruising roots or branches.
 - 5. Fires under and adjacent trees.
 - 6. Discharge exhaust under foliage.
 - 7. Securing cable, chain, or rope to trees.
 - 8. Change of grade within drip line of trees without Landscape Architect's approval.
 - 9. The use of lime.

3.2 TREE TRUNK PROTECTION

- A. Conform to requirements for trees to be retained, in accordance with article GENERAL REQUIREMENTS FOR TREES TO BE RETAINED.
- B. Install boards vertically around tree and bind together with wire to protect the bark 360 degrees around the entire tree prior to start of any demolition and construction. Boards are not to dig into bark.
- C. Major scaffold limbs may require plastic fencing to be wrapped around them for protection.

3.3 TREE DRIPLINE PROTECTION

- A. The Tree Protection Zone (TPZ) is a restricted area around the base of the tree with a radius of one foot (1') for every inch of tree trunk diameter or ten feet, which ever is greater, enclosed by 6' tall chain link fence unless otherwise directed.
- B. Signage designating the protection zone and penalties for violations shall be secured in prominent location on each protection fence.

3.4 TREE PROTECTION

- A. Duration: Tree protection shall be erected before demolition, grading, or any construction begins and remain in place until final inspection of the project.
- B. Conform to requirements for trees and plants to be retained, in accordance with article GENERAL REQUIREMENTS FOR TREES TO BE RETAINED.
- C. Construction shall not commence until approval of the Fenced Tree Protection Area Plan and Schedule of Activities Inside Tree Protection Area have been obtained from the Architect.
- D. Vehicle movement within the TPZ will only be allowed for construction equipment.
 - 1. Within dripline, apply 10-inch layer of mulch over geotextile fabric.
- E. Perform trenching operations within the TPZ of the tree so that:
 - 1. Digging shall be by hand using narrow trenching shovel.
 - 2. No roots larger than 2" diameter are cut and utilities are routed around or below them.
 - 3. Roots smaller than 2" diameter are cut with sharp tools, saws, loppers; not torn, chopped or broken.
- F. Where roots are exposed:
 - 1. Do not allow the roots to dry out.
 - 2. On the same day the excavation is made, provide temporary backfill to original grade at tree roots,

TEMPORARY TREE PROTECTION
SECTION 01 5639
3595001

3. Or cover roots with 4 layers of wet untreated burlap, made wet each day, including weekends.
- G. Roots larger than 3" in diameter are not to be cut without review and approval by an Arborist provided by Owner.

3.5 REPAIR AND REPLACEMENT OF TREES

- A. Repair or replace damaged trees as required or directed.
- B. Repair trees damaged by operations:
 1. within 24 hours of damage,
 2. to satisfaction of Landscape Architect,
 3. to ANSI A300 Pruning Standards.
- C. Replace repaired trees where repair has not restored them to health or aesthetics:
 1. within 6 months of request to replace,
 2. to the satisfaction of Landscape Architect,
 3. with replacement trees of a size and variety matching those that were removed,
- D. Replaced trees shall be maintained in good health and aesthetics for the duration of the project from installation.
 1. Submit comprehensive maintenance plan for replacement trees, including but not limited to provisions for irrigation system independent of existing system.
- E. Where suitable replacement of trees is not available:
 1. Submit affidavit to Landscape Architect that they are not available.
 2. Provide compensation to Owner at the following rates:
 - a. \$2000 for each caliper inch of tree removed under 12 inches.
 - b. \$4000 for each caliper inch of tree removed 12 inches or greater.
 - c. Caliper of trees measured at 6 inches above grade.
 - d. Caliper defined here as thickness of diameter, measured in inches.

3.6 SOIL CONTAMINATION

- A. Remove soil that has been contaminated during the performance of the Work by oil, solvents, and other materials which could be harmful to trees and plants.

TEMPORARY TREE PROTECTION
SECTION 01 5639
3595001

1. Replace with good soil in conformance with Section 31 0000, Earthwork, at Contractor's expense.

END OF SECTION

*p:\sacramento\3595 tracy unified school district\001-000_villalovoz es new shade structures\08 specifications\06 spec\04 final\freiler
- shade struct\01 5639_temporary tree protection.docx
New File: January 6, 2022*

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Requirements for preparing Storm Water Pollution Prevention Plan.

1.2 SCOPE OF WORK

A. General: Provide all materials, equipment and labor necessary to furnish and install straw wattles or silt fence barriers at locations shown on the Drawings and as required during construction.

B. The Contractor shall as a minimum address:

1. Cut and fill operations.
2. Temporary stockpiles.
3. Vehicle and equipment storage, maintenance and fueling operations.
4. Concrete, plaster, mortar and paint disposal.
5. Dust control.
6. Tracking of dirt, mud on off-site streets.
7. Pipe flushing.

1.3 ADMINISTRATIVE REQUIREMENTS

A. Submittal Procedures:

B. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures

1.4 QUALITY ASSURANCE

A. General: Comply with governing codes and regulations.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Straw Wattles: New manufactured straw rolls in compliance with state requirements for sediment control.

B. Silt Fences: New manufactured silt fence in compliance with state requirements for sediment control.

C. Filter Bag: As required by local jurisdiction.

**EROSION CONTROL
SECTION 01 5713.10
3595001**

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Straw Wattles: Install per the drawings and/or as required.
- B. Silt Fences: Install per the Drawings and/or as required. Silt Fences shall not be used around inlets.
- C. Filter Bags: Installed as required by manufacturer's requirements.

3.2 MAINTENANCE AND REMOVAL:

- A. General: Maintain and repair existing and new erosion control facilities throughout the construction period. Remove silt build up at straw wattles and/or silt fences as needed. Repair damage to earth slopes and banks. Erosion control measures shall be left in place until final paving and landscaping are complete.
- B. Monitoring: Provide monitoring of erosion control measures before and after storm events.
- C. Cleaning: Keep area clean of debris.
- D. Remove erosion control measures prior to placing finish landscaping.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: VOC restrictions for product categories listed below under Article "DEFINITIONS" and in compliance with the following.
 - 1. California Code of Regulations, Title 24, Part 11 California Green Building Standards Code.
 - 2. Local Agency Division of the State Architect.
 - 3. No Rating System is applicable.
- B. Products of each category that are installed in the project must comply; applicable laws and ordinances do not allow for partial compliance.
- C. Listing of a product in these Specifications shall not be construed as a solicitation or requirement to use any product or combination of products in violation of the requirements of South Coast Air Quality Management District Rule No.1168, as described in Rule 1168(g).
 - 1. If a listed product does not meet the requirements of this rule, request approval for use of an alternate product by the same or another manufacturer meeting the requirements of this rule.
 - 2. Do not use products which do not meet the requirements of this rule.

1.2 RELATED REQUIREMENTS

- A. Divisions 01 through 33 contain related requirements specific to the work of each of these Sections. Requirements may or may not include reference to this Section.
- B. Section 01 8113, Sustainable Design Requirements, for CAL-Green general requirements and procedures.

1.3 REFERENCES

- A. California Green Building Standards Code (CALGreen), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. Low-Emitting Materials Product List; California Collaborative for High Performance Schools (CHPS); current edition at www.chps.net/.
- C. CRI (GLCC) - Green Label Testing Program - Approved Product Categories for Carpet Cushion; Carpet and Rug Institute; current edition.
- D. CRI (GLP) - Green Label Plus Carpet Testing Program - Approved Products; Carpet and Rug Institute; current edition.
- E. GEI (SCH) - GREENGUARD "Children and Schools" Certified Products; GREENGUARD Environmental Institute; current listings at www.greenguard.org.

VOLATILE ORGANIC COMPOUND (VOC) RESTRICTIONS

SECTION 01 6116.10

3595001

- F. GreenSeal GS-36 - Commercial Adhesives; Green Seal, Inc.
- G. SCAQMD 1168 - South Coast Air Quality Management District Rule No.1168; current edition; www.aqmd.gov.
- H. SCS (CPD) - SCS Certified Products; Scientific Certification Systems; current listings at www.scs-certified.com.

1.4 DEFINITIONS

- A. VOC-Restricted Products: Products of each of the following categories when installed or applied on-site:
 - 1. Adhesives, sealants, and sealer coatings, regardless of specification Section or Division.
 - 2. Paints and coatings.
 - 3. Carpet and resilient flooring.
 - 4. Composite wood products; plywood, particleboard, wood fiberboard.
- B. Adhesives: Gunnable, trowelable, liquid-applied, and aerosol adhesives, whether specified or not; including flooring adhesives, resilient base adhesives, and pipe jointing adhesives.
- C. Sealants: Gunnable, trowelable, and liquid-applied joint sealants and sealant primers, whether specified or not; including firestopping sealants and duct joint sealers.

1.5 SUBMITTAL REQUIREMENTS

- A. Product Data: For each VOC-restricted product used in the project, submit product data showing compliance, except when another type of evidence of compliance is required.
- B. Verification of Compliance: Submit for each different product in each applicable category.
 - 1. Identify evidence submittals with the words "CALGreen VOC Compliance Report".
- C. Installer Certifications for Accessory Materials:
 - 1. Require each installer of any type of product, not just the products for which VOC restrictions are specified, to certify that either 1) no adhesives, joint sealants, paints, coatings, or composite wood or agrifiber products have been used in the installation of their products, or 2) that such products used comply with these requirements.
 - 2. Use the form following at the end of Part 3 in this Section for Installer certifications.

1.6 QUALITY ASSURANCE

- A. Manufacturer's Testing Agency Qualifications: Independent firm specializing in performing testing and inspections of the type specified in this Section.

PART 2 - PRODUCTS

2.1 MATERIALS

A. General:

1. Provide products conforming to local, State and Federal government requirements limiting the amount of volatile organic compounds contained in the product, for its intended application. If specified product exceeds current requirement, provide conforming product at no additional cost.
2. Provide only products having volatile organic compound (VOC) content not greater than required by South Coast Air Quality Management District Rule No.1168 and less where required by code.
3. Products are specified in multiple Sections throughout these Specifications.

B. Adhesives, Including Carpet and Cushion Adhesives: Comply with CALGreen Section 5.504 and Table 5.504.4.1.

1. Verification of Compliance: Acceptable types are:
 - a. Report of laboratory testing performed in accordance with requirements.
 - b. Published product data showing compliance with requirements.
 - c. Certification by manufacturer that product complies with requirements.
2. Aerosol Adhesives: Comply with Table 5.504.4.1 of CalGreen Section 5.504, and California Code of Regulations Title 17, Section 94507.
 - a. Verification of Compliance: Acceptable types are:
 - 1) Current GreenSeal Certification.
 - 2) Report of laboratory testing performed in accordance with GreenSeal GS-36 requirements.
 - 3) Published product data showing compliance with requirements.
3. Products used shall comply with the following limits.

Table 5.504.4.1 ADHESIVE VOC LIMIT	
Architectural Applications	Current VOC Limit
Indoor Carpet Adhesives	50
Carpet Pad Adhesives	50
Outdoor Carpet Adhesives	150
Wood Flooring Adhesive	100
Rubber Floor Adhesives	60
Subfloor Adhesives	50
Ceramic Tile Adhesives	65
VCT and Asphalt Tile Adhesives	50
Dry Wall and Panel Adhesives	50
Cove Base Adhesives	50
Multipurpose Construction Adhesives	70
Structural Glazing Adhesives	100

VOLATILE ORGANIC COMPOUND (VOC) RESTRICTIONS
SECTION 01 6116.10
3595001

Table 5.504.4.1 ADHESIVE VOC LIMIT	
Single Ply Roof Membrane Adhesives	250
Other adhesives not specifically listed	250
VOC Limits and Effective Dates**	
Specialty Applications	Current VOC Limit
PVC Welding	510
CPVC Welding	490
ABS Welding	325
Plastic Cement Welding	250
Adhesive Primer for Plastic	550
Contact Adhesive	80
Special Purpose Contact Adhesive	250
Structural Wood Member Adhesive	140
Top and Trim Adhesive	250
** The specified limits remain in effect unless revised limits are listed in the current governing edition of CalGreen.	
For adhesives, adhesive bonding primers, or any other primer not regulated by the above two Tables and applied to the following substrates, the following limits shall apply:	
Substrate Specific Applications	Current VOC Limit
Metal to Metal	30
Plastic Foams	50
Porous Material (except wood)	50
Wood	30
Fiberglass 80	80
Note: If an adhesive is used to bond dissimilar substrates together the adhesive with the highest VOC content shall be allowed.	

C. Joint Sealants: Comply with CALGreen Section 5.504 and Table 5.504.4.2.

1. Verification of Compliance: Acceptable types are:
 - a. Report of laboratory testing performed in accordance with requirements.
 - b. Published product data showing compliance with requirements.
 - c. Certification by manufacturer that product complies with requirements.
2. Products used shall comply with the following limits.

Table 5.504.4.2 SEALANT VOC LIMIT	
Less Water and Less Exempt Compounds in Grams per Liter	
Sealant	Current VOC Limit
Architectural	250
Marine Deck	760
Non-Membrane Roof	300
Roadway	250
Single-Ply Roof Membrane	450

VOLATILE ORGANIC COMPOUND (VOC) RESTRICTIONS**SECTION 01 6116.10****3595001**

Table 5.504.4.2 SEALANT VOC LIMIT	
Less Water and Less Exempt Compounds in Grams per Liter	
Other	420
Sealant Primers	Current VOC Limit
Architectural	
Non-Porous	250
Porous	775
Modified Bituminous	500
Marine Deck	760
Other	750
For low-solid adhesives or sealants the VOC limit is expressed in grams per liter of material; for all other adhesives and sealants, VOC limits are expressed as grams of VOC per liter of adhesive or sealant less water and less exempt compounds.	

- D. Paints and Coatings: Comply with CALGreen Section 5.504 and Table 5.504.4.3 based on the California Air Resources Board, Architectural Coatings Suggested Control Measure.
1. Determination of VOC Content: Testing and calculation in accordance with 40 CFR 59, Subpart D (EPA Method 24), exclusive of colorants added to a tint base and water added at Project site; or other method acceptable to authorities having jurisdiction.
 - a. Verification of Compliance: Acceptable types are:
 - 1) Report of laboratory testing performed in accordance with requirements.
 - 2) Published product data showing compliance with requirements.
 - 3) Certification by manufacturer that product complies with requirements.
 2. Provide coatings that comply with the most stringent requirements specified in the following:
 - a. 40 CFR 59, Subpart D--National Volatile Organic Compound Emission Standards for Architectural Coatings.
 - b. South Coast Air Quality Management District Rule No.1168.
 3. Aerosol Paints and Coatings: Comply with CALGreen 5.504.4.3.1 and, for projects in the jurisdiction of BAAQMD, comply with VOC by weight of product limits of regulation 8, Rule 49.
 4. Products used shall comply with the following limits.

Table 5.504.4.3 VOC CONTENT LIMITS FOR ARCHITECTURAL COATINGS	
(See Notes 2 & 3 below)	
Grams of VOC per Liter of Coating, less water and less exempt compounds	
Coating Category	Current VOC Limit 1/1/2012
Flat Coatings	50

VOLATILE ORGANIC COMPOUND (VOC) RESTRICTIONS
SECTION 01 6116.10
3595001

Table 5.504.4.3 VOC CONTENT LIMITS FOR ARCHITECTURAL COATINGS (See Notes 2 & 3 below)	
Grams of VOC per Liter of Coating, less water and less exempt compounds	
Coating Category	Current VOC Limit 1/1/2012
Non-Flat Coatings	100
Non-Flat High Gloss Coatings	150
Specialty Coatings	
Aluminum Roof Coatings	400
Basement Specialty Coatings	400
Bituminous Roof Coatings	50
Bituminous Roof Primers	350
Bond Breakers	350
Concrete Curing Compounds	350
Concrete / Masonry Sealers	100
Driveway Sealers	50
Dry Fog Coatings	150
Faux Finishing Coatings	350
Fire Resistive Coatings	350
Floor Coatings	100
Form-Release Compounds	250
Graphic Arts Coatings (Sign Paints)	500
High-Temperature Coatings	420
Industrial Maintenance Coatings	250
Low Solids Coatings (See Note 1 below)	120
Magnesite Cement Coatings	450
Mastic Texture Coatings	100
Metallic Pigmented Coatings	500
Multicolor Coatings	250
Pretreatment Wash Primers	420
Primers, Sealers and Undercoaters	100
Reactive Penetrating Sealers	350
Recycled Coatings	250
Roof Coatings	50
Rust Preventative Coatings	250
Shellacs:	
Clear	730
Opaque	550
Specialty Primers, Sealers and Undercoaters	100
Stains	250
Stone Consolidants	450
Swimming Pool Coatings	340
Traffic Marking Coatings	100
Waterproofing Membranes	250
Wood Coatings	275
Wood Preservatives	350

VOLATILE ORGANIC COMPOUND (VOC) RESTRICTIONS
SECTION 01 6116.10
3595001

Table 5.504.4.3 VOC CONTENT LIMITS FOR ARCHITECTURAL COATINGS (See Notes 2 & 3 below)	
Grams of VOC per Liter of Coating, less water and less exempt compounds	
Coating Category	Current VOC Limit 1/1/2012
Zinc Rich Primers	340
Note 1: Grams of VOC per liter of coating including water and including exempt compounds	
Note 2: Not Applicable	
Note 3: Values in this table are derived from those specified by the California Air Resources Board, Architectural Coatings Suggested Control Measure, February 1, 2008. More information is available from the Air Resources Board.	

5. Restricted Components: In addition to the specified VOC limits, paints and coatings shall not contain any of the following:
- a. Acrolein.
 - b. Acrylonitrile.
 - c. Antimony.
 - d. Benzene.
 - e. Butyl benzyl phthalate.
 - f. Cadmium.
 - g. Di (2-ethylhexyl) phthalate.
 - h. Di-n-butyl phthalate.
 - i. Di-n-octyl phthalate.
 - j. 1,2-dichlorobenzene.
 - k. Diethyl phthalate.
 - l. Dimethyl phthalate.
 - m. Ethylbenzene.
 - n. Formaldehyde.
 - o. Hexavalent chromium.
 - p. Isophorone.
 - q. Lead.
 - r. Mercury.
 - s. Methyl ethyl ketone.
 - t. Methyl isobutyl ketone.
 - u. Methylene chloride.
 - v. Naphthalene.
 - w. Toluene (methylbenzene).
 - x. 1,1,1-trichloroethane.
 - y. Vinyl chloride.

VOLATILE ORGANIC COMPOUND (VOC) RESTRICTIONS
SECTION 01 6116.10
3595001

PART 3 - EXECUTION

3.1 FIELD QUALITY CONTROL

- A. Owner reserves the right to reject non-compliant products, whether installed or not, and require their removal and replacement with compliant products at no extra cost to Owner.
- B. Additional costs to restore indoor air quality, including fines by authorities, due to installation of non-compliant products shall be borne by Contractor.

3.2 CERTIFICATION FORM

- A. Use of this Form:
 - 1. Because installers are allowed and directed to choose accessory materials suitable for the applicable installation, there is a possibility that such accessory materials might contain VOC content in excess of that permitted, especially where such materials have not been explicitly specified.
 - 2. Contractor is required to obtain and submit this Form from each installer of work on this project.
 - 3. For each product category listed, circle the correct words in brackets: either [HAS] or [HAS NOT].
 - 4. If these accessory materials have been used, attach to this form product data and MSDS sheet for each such product.

(The Remainder of this Page is Intentionally Left Blank)

ACCESSORY MATERIAL VOC CONTENT CERTIFICATION FORM

IDENTIFICATION:

Project Name: _____

Project No.: _____

Architect: _____

PRODUCT CERTIFICATION: I certify that the installation work of my firm on this project:

1. [HAS] [HAS NOT] required the use of any ADHESIVES.
2. [HAS] [HAS NOT] required the use of any JOINT SEALANTS.
3. [HAS] [HAS NOT] required the use of any PAINTS OR COATINGS.
4. [HAS] [HAS NOT] required the use of any COMPOSITE WOOD or AGRIFIBER PRODUCTS.

Product data and MSDS sheets are attached.

CERTIFIED BY (Installer/Manufacturer/Supplier Firm):

Firm Name: _____

Print Name: _____

Signature: _____

Title: _____ (officer of company)

Date: _____

VOLATILE ORGANIC COMPOUND (VOC) RESTRICTIONS
SECTION 01 6116.10
3595001

END OF SECTION

*p:\sacramento\3595 tracy unified school district\001-000_villalovoz es new shade structures\08 specifications\06 spec\04 final\freiler
- shade struct\01 6116.10_volatile organic compound (voc) restrictions.docx
Last Updated: January 18, 2022*

SECTION 01 66 00

PRODUCT DELIVERY, STORAGE AND HANDLING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Site Access, Conditions and Requirements;
- B. Special Conditions.

1.02 PRODUCTS

- A. Products are as defined in the General Conditions.
- B. Contractor shall not use and/or reuse materials and/or equipment removed from existing Premises, except as specifically permitted by the Contract Documents.
- C. Contractor shall provide interchangeable components of the same manufacturer, for similar components.

1.03 TRANSPORTATION AND HANDLING

- A. Contractor shall transport and handle Products in accordance with manufacturer's instructions.
- B. Contractor shall promptly inspect shipments to confirm that Products comply with requirements, quantities are correct, and products are undamaged.
- C. Contractor shall provide equipment and personnel to handle Products by methods to prevent soiling, disfigurement, or damage.

1.04 STORAGE AND PROTECTION

- A. Contractor shall store and protect Products in accordance with manufacturer's instructions, with seals and labels intact and legible. Contractor shall store sensitive products in weather-tight, climate controlled enclosures.
- B. For exterior storage of fabricated Products, Contractor shall place on sloped supports, above ground.
- C. Contractor shall provide off-site storage and protection when Site does not permit on-site storage or protection.

- D. Contractor shall cover products subject to deterioration with impervious sheet covering and provide ventilation to avoid condensation.
- E. Contractor shall store loose granular materials on solid flat surfaces in a well-drained area and prevent mixing with foreign matter.
- F. Contractor shall provide equipment and personnel to store Products by methods to prevent soiling, disfigurement, or damage.
- G. Contractor shall arrange storage of Products to permit access for inspection and periodically inspect to assure Products are undamaged and are maintained under specified conditions.

PART 2 – PRODUCTS Not Used.

PART 3 - EXECUTION Not Used.

END OF DOCUMENT

FIELD ENGINEERING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Site Investigation, and Soils Investigation Report;
- B. Special Conditions;
- C. Site-Visit Certification.

1.02 REQUIREMENTS INCLUDED:

- A. Contractor shall provide and pay for field engineering services by a California-registered engineer, required for the project, including, without limitations:
 - (1) Survey work required in execution of the Project.
 - (2) Civil or other professional engineering services specified, or required to execute Contractor's construction methods.

1.03 QUALIFICATIONS OF SURVEYOR OR ENGINEERS:

Contractor shall only use a qualified licensed engineer or registered land surveyor, to whom District makes no objection.

1.04 SURVEY REFERENCE POINTS:

- A. Existing basic horizontal and vertical control points for the Project are those designated on the Drawings.
- B. Contractor shall locate and protect control points prior to starting Site Work and preserve all permanent reference points during construction. In addition Contractor shall:
 - (1) Make no changes or relocation without prior written notice to District and Architect.
 - (2) Report to District and Architect when any reference point is lost or destroyed, or requires relocation because of necessary changes in grades or locations.
 - (3) Require surveyor to replace Project control points based on original survey control that may be lost or destroyed.

1.05 RECORDS:

Contractor shall maintain a complete, accurate log of all control and survey work as it progresses.

1.06 SUBMITTALS:

- A. Contractor shall submit name and address of Surveyor and Professional Engineer to District and Architect prior to its/their work on the Project.
- B. On request of District and Architect, Contractor shall submit documentation to verify accuracy of field engineering work, at no additional cost to the District.
- C. Contractor shall submit a certificate signed by registered engineer or surveyor certifying that elevations and locations of improvements are in conformance or nonconformance with Contract Documents.

PART 2 – PRODUCTS Not Used.**PART 3 - EXECUTION****3.01 COMPLIANCE WITH LAWS:**

Contractor is responsible for meeting all applicable codes, OSHA, safety and shoring requirements.

3.02 NONCONFORMING WORK:

Contractor is responsible for any re-surveying required by correction of nonconforming work.

END OF DOCUMENT

CUTTING AND PATCHING

PART 1 – GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Inspector, Inspections, and Tests, Integration of Work, Nonconforming Work, and Correction of Work, and Uncovering Work;
- B. Special Conditions;
- C. Imported Materials Certification.

1.02 CUTTING AND PATCHING:

- A. Contractor shall be responsible for all cutting, fitting, and patching, including associated excavation and backfill, required to complete the Work or to:
 - (1) Make several parts fit together properly.
 - (2) Uncover portions of Work to provide for installation of ill-timed Work.
 - (3) Remove and replace defective Work.
 - (4) Remove and replace Work not conforming to requirements of Contract Documents.
 - (5) Remove Samples of installed Work as specified for testing.
 - (6) Provide routine penetrations of non-structural surfaces for installation of piping and electrical conduit.
 - (7) Attaching new materials to existing remodeling areas – including painting (or other finishes) to match existing conditions.
- B. In addition to Contract requirements, upon written instructions from the District, Contractor shall uncover Work to provide for observations of covered Work in accordance with the Contract Documents; remove samples of installed materials for testing as directed by District; and remove Work to provide for alteration of existing Work.
- C. Contractor shall not cut or alter Work, or any part of it, in such a way that endangers or compromises the integrity of the Work, the Project, or work of others.

1.03 SUBMITTALS:

- A. Prior to any cutting or alterations that may affect the structural safety of Project, or work of others, and well in advance of executing such cutting or alterations, Contractor shall submit written notice to District pursuant to the applicable notice provisions of the Contract Documents, requesting consent to proceed with the cutting or alteration, including the following:
 - (1) The work of the District or other trades.
 - (2) Structural value or integrity of any element of Project.
 - (3) Integrity or effectiveness of weather-exposed or weather-resistant elements or systems.
 - (4) Efficiency, operational life, maintenance or safety of operational elements.
 - (5) Visual qualities of sight-exposed elements.
- B. Contractor's Request shall also include:
 - (1) Identification of Project.
 - (2) Description of affected Work.
 - (3) Necessity for cutting, alteration, or excavations.
 - (4) Effects of Work on District, other trades, or structural or weatherproof integrity of Project.
 - (5) Description of proposed Work:
 - (a) Scope of cutting, patching, alteration, or excavation.
 - (b) Trades that will execute Work.
 - (c) Products proposed to be used.
 - (d) Extent of refinishing to be done.
 - (6) Alternates to cutting and patching.
 - (7) Cost proposal, when applicable.
 - (8) The scheduled date the Contractor intends to perform the Work and the duration of time to complete the Work.
 - (9) Written permission of District or other District contractor(s) whose work will be affected.

1.04 QUALITY ASSURANCE:

- A. Contractor shall ensure that cutting, fitting, and patching shall achieve security, strength, weather protection, appearance for aesthetic match, efficiency, operational life, maintenance, safety of operational elements, and the continuity of existing fire ratings.
- B. Contractor shall ensure that cutting, fitting, and patching shall successfully duplicate undisturbed adjacent profiles, materials, textures, finishes, colors, and that materials shall match existing construction. Where there is dispute as to whether duplication is successful or has been achieved to a reasonable degree, the District's decision shall be final.

1.05 PAYMENT FOR COSTS:

- A. Cost caused by ill-timed or defective Work or Work not conforming to Contract Documents, including costs for additional services of the District, its consultants, including but not limited to the Construction Manager, the Architect, the Project Inspector(s), Engineers, and Agents, will be paid by Contractor and/or deducted from the Contract by the District.
- B. District shall only pay for cost of Work if it is part of the original Contract Price or if a change has been made to the contract in compliance with the provisions of the General Conditions. Cost of Work performed upon instructions from the District, other than defective or nonconforming Work, will be paid by District on approval of written Change Order. Contractor shall provide written cost proposals prior to proceeding with cutting and patching.

PART 2 - PRODUCTS

2.01 MATERIALS:

- A. Contractor shall provide for replacement and restoration of Work removed. Contractor shall comply with the Contract Documents and with the Industry Standard(s), for the type of Work, and the Specification requirements for each specific product involved. If not specified, Contractor shall first recommend a product of a manufacturer or appropriate trade association for approval by the District.
- B. Materials to be cut and patched include those damaged by the performance of the Work.

PART 3 – EXECUTION

3.01 INSPECTION:

- A. Contractor shall inspect existing conditions of the Site and the Work, including elements subject to movement or damage during cutting and patching, excavating and backfilling. After uncovering Work, Contractor shall inspect conditions affecting installation of new products.

- B. Contractor shall report unsatisfactory or questionable conditions in writing to District as indicated in the General Conditions and shall proceed with Work as indicated in the General Conditions by District.

3.02 PREPARATION:

- A. Contractor shall provide shoring, bracing and supports as required to maintain structural integrity for all portions of the Project, including all requirements of the Project.
- B. Contractor shall provide devices and methods to protect other portions of Project from damage.
- C. Contractor shall, provide all necessary protection from weather and extremes of temperature and humidity for the Project, including without limitation, any work that may be exposed by cutting and patching Work. Contractor shall keep excavations free from water.

3.03 ERECTION, INSTALLATION AND APPLICATION:

- A. With respect to performance, Contractor shall:
 - (1) Execute fitting and adjustment of products to provide finished installation to comply with and match specified tolerances and finishes.
 - (2) Execute cutting and demolition by methods that will prevent damage to other Work, and provide proper surfaces to receive installation of repairs and new Work.
 - (3) Execute cutting, demolition excavating, and backfilling by methods that will prevent damage to other Work and damage from settlement.
- B. Contractor shall employ original installer or fabricator to perform cutting and patching for:
 - (1) Sight-exposed finished surfaces.
- C. Contractor shall execute fitting and adjustment of products to provide a finished installation to comply with specified products, functions, tolerances, and finishes as shown or specified in the Contract Documents including, without limitation, the Drawings and Specifications.
- D. Contractor shall fit Work airtight to pipes, sleeves, conduit, and other penetrations through surfaces. Contractor shall conform to all Code requirements for penetrations or the Drawings and Specifications, whichever calls for a higher quality or more thorough requirement. Contractor shall maintain integrity of both rated and non-rated fire walls, ceilings, floors, etc.
- E. Contractor shall restore Work which has been cut or removed. Contractor shall install new products to provide completed Work in accordance with requirements of the Contract Documents and as required to match surrounding areas and surfaces.

- F. Contractor shall refinish all continuous surfaces to nearest intersection as necessary to match the existing finish to any new finish.

END OF DOCUMENT

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes: Requirements and procedures for ensuring optimal diversion of construction waste materials generated by the Work from landfill disposal within the limits of the Construction Schedule and Contract Sum.
 - 1. The Work of this Contract requires that a minimum of **[65%]** by weight of the construction and demolition materials generated in the Work is diverted from landfill disposal through a combination of re-use and recycling activities.
 - 2. CAL-Green: Alternate waste reduction methods developed in cooperation with local agencies if diversion or recycle facilities capable of compliance with CAL-Green requirements do not exist within the haul boundary of the jobsite (California Code of Regulations, Title 24, Part 11, 5.408).
 - 3. **[LEED projects: Requirements for submittal of LEED documentation in compliance with Materials and Resources Credit 2.1 and Materials and Resources Credit 2.2, Construction Waste Management.]**
 - 4. Requirements for submittal of Contractor's Construction Waste and Recycling Plan prior to the commencement of the Work.
 - 5. Contractor's quantitative reports for construction waste materials as a condition of approval of progress payments submitted to the **[EDIT: Architect or Construction Manager]**

1.2 RELATED REQUIREMENTS

- A. Section 01 3516, Alteration Project Procedures.
- B. Section 01 5000, Temporary Facilities & Controls.
- C. Section 01 7329, Cutting and Patching.
- D. Section 01 8113, Sustainable Design Requirements, for CAL-Green general requirements and procedures.
- E. Section 02 2600, Hazardous Material Abatement (Various Materials).
- F. Section 02 2623, Asbestos Assessment.
- G. Section 02 2626, Lead Assessment.
- H. Section 02 2629, Hazardous Materials Assessment - PCB Ballast & Fluorescent Lamps.
- I. Section 02 4116, Building Demolition.
- J. Section 02 4119, Selective Demolition.
- K. Section 31 1000, Site Clearing.

CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL
SECTION 01 7419
3595001

1.3 REFERENCES AND STANDARDS

- A. California Green Building Standards Code (CALGreen), edition as noted on the drawings, as adopted by the California Division of the State Architect (DSA).

1.4 DEFINITIONS

- A. Class III Landfill: A landfill that accepts non-hazardous resources such as household, commercial, and industrial waste, resulting from construction, remodeling, repair, and demolition operations. A Class III landfill must have a solid waste facilities permit from the California Integrated Waste Management Board (CIWMB) and is regulated by the Enforcement Agency (EA).
- B. Construction and Demolition Debris: Building materials and solid waste resulting from construction, remodeling, repair, cleanup, or demolition operations that are not hazardous as defined in California Code of Regulations, Title 22, Section 66261.3 et seq. This term includes, but is not limited to, asphalt concrete, Portland cement concrete, brick, lumber, gypsum wallboard, cardboard and other associated packaging, roofing material, ceramic tile, carpeting, plastic pipe, and steel. The debris may be commingled with rock, soil, tree stumps, and other vegetative matter resulting from land clearing and landscaping for construction or land development projects.
- C. C&D Recycling Center: A facility that receives only construction and demolition debris material that has been separated for reuse prior to receipt, in which the residual (disposed) amount of waste in the material is less than 10% of the amount separated for reuse by weight.
- D. Disposal: Final deposition of construction and demolition or inert debris into land, including stockpiling onto land of construction and demolition debris that has not been sorted for further processing or resale, if such stockpiling is for a period of time greater than 30 days; and construction and demolition debris that has been sorted for further processing or resale, if such stockpiling is for a period of time greater than one year, or stockpiling onto land of inert debris that is for a period of time greater than one year.
- E. Enforcement Agency (EA): Enforcement agency is the authority having jurisdiction within the Project location.
- F. Inert Disposal Facility or Inert Waste Landfill: A disposal facility that accepts only inert waste such as soil and rock, fully cured asphalt paving, uncontaminated concrete (including fiberglass or steel reinforcing rods embedded in the concrete), brick, glass, and ceramics, for land disposal.
- G. Mixed Debris: Loads that include commingled recyclable and non-recyclable materials generated at the construction site.
- H. Mixed Debris Recycling Facility: A processing facility that accepts loads of commingled construction and demolition debris for the purpose of recovering re-usable and recyclable materials and disposing the non-recyclable residual materials.

CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL
SECTION 01 7419
3595001

- I. Recycling: The process of sorting, cleansing, treating and reconstituting materials for the purpose of using the altered form in the manufacture of a new product. Recycling does not include burning, incinerating or thermally destroying solid waste.
- J. Reuse. The use, in the same or similar form as it was produced, of a material which might otherwise be discarded.
- K. Separated for Reuse. Materials, including commingled recyclables, that have been separated or kept separate from the solid waste stream for the purpose of additional sorting or processing those materials for reuse or recycling in order to return them to the economic mainstream in the form of raw material for new, reused, or reconstituted products which meet the quality standards necessary to be used in the marketplace, and includes materials that have been "source separated".
- L. Solid Waste: All putrescible and nonputrescible solid, semisolid, and liquid wastes, including garbage, trash, refuse, paper, rubbish, ashes, industrial wastes, demolition and construction wastes, abandoned vehicles and parts thereof, discarded home and industrial appliances, dewatered, treated, or chemically fixed sewage sludge which is not hazardous waste, manure, vegetable or animal solid and semisolid wastes, and other discarded solid and semisolid wastes. "Solid waste" does not include hazardous waste, radioactive waste, or medical waste as defined or regulated by State law.
- M. Source-Separated: Materials, including commingled recyclables, that have been separated or kept separate from the solid waste stream at the point of generation, for the purpose of additional sorting or processing of those materials for reuse or recycling in order to return them to the economic mainstream in the form of raw materials for new, reused, or reconstituted products which meet the quality standards necessary to be used in the marketplace.
- N. Waste Hauler: A company that possesses a valid permit from the local waste management authority having jurisdiction to collect and transport solid wastes from individuals or businesses for the purpose of recycling or disposal.

1.5 ADMINISTRATIVE REQUIREMENTS

- A. Submittal Procedures:
 - 1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
 - 2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
 - 3. Sustainable Design Submittals shall comply with the additional requirements of Section 01 8113, Sustainable Design Requirements.

1.6 ACTION SUBMITTALS

- A. Contractor's Construction Waste and Recycling Plan:
 - 1. Review Contract Documents and estimate the types and quantities of materials under the Work that are anticipated to be feasible for on-site processing, source separation for re-use or recycling. Indicate the procedures that will be implemented

CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL
SECTION 01 7419
3595001

- in this program to effect jobsite source separation, such as, identifying a convenient location where dumpsters would be located, putting signage to identify materials to be placed in dumpsters, etc.
2. Prior to commencing the Work, submit Contractor's Construction Waste and Recycling Plan. Submit in format provided with this specification section. The Plan must include, but is not limited to the following:
 - a. Contractor's name and project identification information;
 - b. Procedures to be used;
 - c. Materials to be re-used and recycled;
 - d. Estimated quantities of materials;
 - e. Names and locations of re-use and recycling facilities/sites;
 - f. Tonnage calculations that demonstrate that Contractor will re-use and recycle a minimum of **[65%]** by weight of the construction waste materials generated by the Work.
 3. Contractor's Construction Waste and Recycling Plan must be approved by the Architect prior to the start of Work.
 4. Contractor's Construction Waste and Recycling Plan will not otherwise relieve the Contractor of responsibility for adequate and continuing control of pollutants and other environmental protection measures

1.7 INFORMATIONAL SUBMITTALS

- A. Contractor's Reuse, Recycling, and Disposal Report:
 1. Submit Contractor's Reuse, Recycling, and Disposal Report on the form provided with this specification section with each Application & Certificate for Payment. Failure to submit the form and its supporting documentation will render the Application & Certificate for Payment incomplete and delay progress payments. If applicable, include manifests, weight tickets, receipts, and invoices specifically identifying the Project for re-used and recycled materials:
 - a. Reuse of building materials or salvage items on site (i.e. crushed base or red clay brick).
 - b. Salvaging building materials or salvage items at an offsite salvage or reuse center (i.e. lighting, fixtures).
 - c. Recycling source separated materials on site (i.e. crushing asphalt/concrete for base course, or grinding for mulch).
 - d. Recycling source separated material at an offsite recycling center (i.e. scrap metal or green materials).
 - e. Use of material as Alternative Daily Cover (ADC) at landfills.
 - f. Delivery of soils or mixed inerts to an inert landfill for disposal (inert fill).
 - g. Disposal at a landfill or transfer station (where no recycling takes place).
 - h. Other (describe).
 2. Contractor's Reuse, Recycling, and Disposal Report must quantify all materials generated in the Work, disposed in Class III landfills, or diverted from disposal through recycling. Indicate zero (0) if there is no quantity to report for a type of material. As indicated on the form:

CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL
SECTION 01 7419
3595001

- a. Report disposal or recycling either in tons or in cubic yards. If scales are available at disposal or recycling facility, report in tons; otherwise, report in cubic yards. Report in units for salvage items when no tonnage or cubic yard measurement is feasible.
 - b. Indicate locations to which materials are delivered for reuse, salvage, recycling, accepted as daily cover, inert backfill, or disposal in landfills or transfer stations.
 - c. Provide legible copies of weight tickets, receipts, or invoices that specifically identify the project generating the material. Said documents must be from recyclers and/or disposal site operators that can legally accept the materials for the purpose of re-use, recycling, or disposal.
 - 1) Indicate project title, project number, progress payment number, name of the company completing the Contractor's Report and compiling backup documentation, the printed name, signature, and daytime phone number of the person completing the form, the beginning and ending dates of the period covered on the Contractor's Report, and the date that the Contractor's Report is completed.
3. Demonstrate compliance with California Code of Regulations, Title 24, Part 11 California Green Building Standards Code, "CAL-Green" 5.408.2, to the satisfaction of the enforcing agency.
- a. Landfill **[and Incinerator]** Disposal Records: Indicate receipt and acceptance of waste by landfills **[and incinerator]** facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.
 - b. Recycling and Processing Facility Records: Indicate receipt and acceptance of recyclable waste by recycling and processing facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.
- B. **[For LEED Projects only]** LEED Letter Template: Materials and Resources Credit **[2.1]**
[2.2] Construction Waste Management
1. Complete and sign LEED Letter Template in format provided under the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED) program. Prepare Letter Template on company letterhead.
 - a. Certify that the project has completed a waste management plan and diverted construction, demolition, and land clearing waste to uses other than landfill.
 - b. Provide quantities of diverted materials and means of diversion in the table provided in the LEED Letter Template.
 - c. Indicate how and where waste was diverted.
 - d. Indicate quantities of waste diverted in tons or cubic yards.
 - e. Letter Template will calculate: Total quantity of diverted waste, total quantity of waste, and the percentage of waste diverted.
 - f. For projects where 50% of waste is diverted, one LEED credit will be achieved; where 75% is diverted, two LEED credits will be achieved.
 - g. Include name, organization, role in project, provide signature and date complete

CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL
SECTION 01 7419
3595001

PART 2 - PRODUCTS-NOT USED

PART 3 - EXECUTION

3.1 WASTE MANAGEMENT PLAN

- A. Implement procedures for disposal of materials, as specified in Contractor's Construction Waste and Recycling Plan, which are not diverted for re-use, salvage or recycling.
 - 1. Identify materials to be diverted from disposal by efficient usage, recycling, reuse on the project, or salvage for future use or sale.
 - 2. Determine if materials will be sorted on-site or mixed.
 - 3. Identify diversion facilities where material collected will be taken.
 - 4. Specify that quantities of diverted material will be calculated by weight or volume, but not both.

3.2 SALVAGE, RE-USE, RECYCLING AND PROCEDURES

- A. Re-use, Salvage, and Recycling Facilities: As specified in Contractor's Construction Waste and Recycling Plan.
- B. Develop and implement procedures to re-use, salvage, and recycle new construction and excavation materials, based on the Contract Documents, the Contractor's Construction Waste and Recycling Plan, estimated quantities of available materials, and availability of recycling facilities. Procedures may include on-site recycling, source separated recycling, and/or mixed debris recycling efforts.
 - 1. Identify materials that are feasible for salvage, determine requirements for site storage, and transportation of materials to a salvage facility.
 - 2. Source separate new construction, excavation and demolition materials including, but not limited to the following types.
 - a. Asphalt.
 - b. Concrete, concrete block, slump stone (decorative concrete block), and rocks.
 - c. Drywall.
 - d. Green materials (i.e. tree trimmings and land clearing debris).
 - e. Metal (ferrous and non-ferrous).
 - f. Miscellaneous Construction Debris.
 - g. Paper or cardboard.
 - h. Red Clay Brick.
 - i. Reuse or Salvage Materials
 - j. Soils.
 - k. Wire and Cable.
 - l. Wood.
 - m. Other (describe)

CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL
SECTION 01 7419
3595001

3. Miscellaneous Construction Debris: Develop and implement a program to transport loads of mixed (commingled) new construction materials that cannot be feasibly source separated to a mixed materials recycling facility

3.3 DISPOSAL OPERATIONS AND WASTE HAULING

- A. Legally transport and dispose of materials that cannot be delivered to a source separated or mixed recycling facility to a transfer station or disposal facility that can legally accept the materials for the purpose of disposal.
- B. Use a permitted waste hauler or Contractor's trucking services and personnel. To confirm valid permitted status of waste haulers, contact the local solid waste authority having jurisdiction.
- C. Become familiar with the conditions for acceptance of new construction, excavation and demolition materials at recycling facilities, prior to delivering materials.
- D. Deliver to facilities that can legally accept new construction, excavation and demolition materials for purpose of re-use, recycling, composting, or disposal.
- E. Do not burn, bury or otherwise dispose of solid waste on the project job-site.

3.4 RE-USE AND DONATION OPTIONS

- A. Implement a re-use program to the greatest extent feasible. Options may include:
 1. California Materials Exchange (CAL-MAX) Program is sponsored by the California Integrated Waste Management Board. CAL-MAX is a free service provided by the California Integrated Waste Management Board, designed to help businesses find markets for materials that traditionally would be discarded. The premise of the CAL-MAX Program is that material discarded by one business may be a resource for another business. To obtain a current Materials Listings Catalog, call CAL-MAX/California Integrated Waste Management Board at (916) 255-2369 or send a FAX to (916) 255-2200. The CALMAX Catalog is available through the Internet Site at <http://www.ciwmb/ca.gov/calmax>.

3.5 REVENUE

- A. Revenues or other savings obtained from recycled, re-used, or salvaged materials shall accrue to Contractor unless otherwise noted in the Contract Documents

END OF SECTION

p:\sacramento\3595 tracy unified school district\001-000_villalovoz es new shade structures\08 specifications\06 spec\04 final\freiler - shade struct\01 7419_construction waste management and disposal.docx
Last Updated: December 16, 2021

SECTION 01 7419A
CONTRACTOR'S CONSTRUCTION WASTE AND RECYCLING PLAN
(Submit After Award of Contract and Prior to Start of Work)

Project Title:		
Contract or Work Order No.:		
Contractor's Name:		
Street Address:		
City:	State:	Zip:
Phone: ()	Fax: ()	
E-Mail Address:		
Prepared by: (Print Name)		

Date Submitted:		
Project Period:	From:	TO:

Reuse, Recycling or Disposal Processes To Be Used

Describe the types of recycling processes or disposal activities that will be used for material generated in the project. Indicate the type of process or activity by number, types of materials, and estimated quantities that will be recycled or disposed in the sections below:

- 01 - Reuse of building materials or salvage items on site (i.e. crushed base or red clay brick)
- 02 - Salvaging building materials or salvage items at an off site salvage or re-use center (i.e. lighting, fixtures)
- 03 - Recycling source separated materials on site (i.e. crushing asphalt/concrete for reuse or grinding for mulch)
- 04 - Recycling source separated materials at an off site recycling center (i.e. scrap metal or green matls)
- 05 - Recycling commingled loads of C&D matls at an off site mixed debris recycling center or transfer station
- 06 - Recycling material as Alternative Daily Cover at landfills
- 07 - Delivery of soils or mixed inerts to an inert landfill for disposal (inert fill).
- 08 - Disposal at a landfill or transfer station.
- 09 - Other (please describe) _____

Types of Material To Be Generated

Use these codes to indicate the types of material that will be generated on the project

A = Asphalt	C = Concrete	M = Metals	I = Mixed Inert	G = Green Matls
D = Drywall	P/C=Paper/Cardboard	W/C = Wire/Cable	S= Soils (Non Hazardous)	
M/C = Miscellaneous Construction Debris	R = Reuse/Salvage	W = Wood	O = Other (describe)	

Facilities Used: Provide Name of Facility and Location (City)

Total Truck Loads: Provide Number of Trucks Hauled from Site During Reporting Period

Total Quantities: If scales are available at sites, report in tons. If not, quantify by cubic yards. For salvage/reuse items, quantify by estimated weight (or units).

SECTION I - RE-USED/RECYCLED MATERIALS

Include all recycling activities for source separated or mixed material recycling centers where recycling will occur.

Type of Material	Type of Activity	Facility to be Used/Location	Total Truck Loads	Total Quantities		
(ex.) M	04	ABC Metals, Los Angeles	24	Tons	Cubic YD	Other Wt.
a. Total Diversion			0	0	0	0

SECTION 01 7419A
CONTRACTOR'S CONSTRUCTION WASTE AND RECYCLING PLAN
Continued

SECTION II - DISPOSED MATERIALS						
<i>Include all disposal activities for landfills, transfer stations, or inert landfills where no recycling will occur.</i>						
Type of Material	Type of Activity	Facility to be Used/Location	Total Truck Loads	Total Quantities		
				Tons	Cubic YD	Other Wt.
(ex.) D	08	DEF Landfill, Los Angeles	2	35		
b. Total Disposal				0	0	0

SECTION III - TOTAL MATERIALS GENERATED						
<i>This section calculates the total materials to be generated during the project period (Reuse/Recycle + Disposal = Generation)</i>						
				Tons	Cubic YD	Other Wt.
a. Total Reused/Recycled				0	0	0
b. Total Disposed				0	0	0
c. Total Generated				0	0	0

SECTION IV - CONTRACTOR'S LANDFILL DIVERSION RATE CALCULATION						
<i>Add totals from Section I + Section II</i>						
	Tons	Cubic Yards	Other Wt.			
a. Materials Re-Used and Recycled	0					
b. Materials Disposed	0					
c. Total Materials Generated (a. + b. = c.)	0	0	0			
d. Landfill Diversion Rate (Tons Only)*	#DIV/0!					

* Use tons only to calculate recycling percentages: $\text{Tons Reused/Recycled/Tons Generated} = \% \text{ Recycled}$

Contractor's Comments (Provide any additional information pertinent to planned reuse, recycling, or disposal activities):

Notes:

1. Suggested Conversion Factors: From Cubic Yards to Tons (Use when scales are not available)

Asphalt: .61 (ex. 1000 CY Asphalt = 610 tons. Applies to broken chunks of asphalt)

Concrete: .93 (ex. 1000 CY Concrete = 930 tons. Applies to broken chunks of concrete)

Ferrous Metals: .22 (ex. 1000 CY Ferrous Metal = 220 tons)

Non-Ferrous Metals: .10 (ex. 1000 CY Non-Ferrous Metals = 100 tons)

Drywall Scrap: .20

Wood Scrap: .16

SECTION 01 7419B
CONTRACTOR'S REUSE, RECYCLING, AND DISPOSAL REPORT
(Submit With Each Progress Payment)

Project Title:		
Contract or Work Order No.:		
Contractor's Name:		
Street Address:		
City:	State:	Zip:
Phone: ()	Fax: ()	
E-Mail Address:		
Prepared by: (Print Name)		

Date Submitted:		
Period Covered:	From:	To:

Reuse, Recycling or Disposal Processes Used

Describe the types of recycling processes or disposal activities used for material generated in the project. Indicate the type of process or activity by number, types of materials, and quantities that were recycled or disposed in the sections below:

01 - Reuse of building materials or salvage items on site (i.e. crushed base or red clay brick)
02 - Salvaging building materials or salvage items at an off site salvage or re-use center (i.e. lighting, fixtures)
03 - Recycling source separated materials on site (i.e. crushing asphalt/concrete for reuse or grinding for mulch)
04 - Recycling source separated materials at an off site recycling center (i.e. scrap metal or green matls)
05 - Recycling commingled loads of C&D matls at an off site mixed debris recycling center or transfer station
06 - Recycling material as Alternative Daily Cover at landfills
07 - Delivery of soils or mixed inerts to an inert landfill for disposal (inert fill).
08 - Disposal at a landfill or transfer station.
09 - Other (please describe) _____

Types of Material Generated

Use these codes to indicate the types of material that were generated on the project

A = Asphalt C = Concrete M = Metals I = Mixed Inert G = Green Matls
D = Drywall P/C=Paper/Cardboard W/C = Wire/Cable S= Soils (Non Hazardous)
M/C = Miscellaneous Construction Debris R = Reuse/Salvage W = Wood O = Other (describe)

Facilities Used: Provide Name of Facility and Location (City)

Total Truck Loads: Provide Number of Trucks Hauled from Site During Reporting Period

Total Quantities: If scales are available at sites, report in tons. If not, quantify by cubic yards. For salvage/reuse items, quantify by estimated weight (or units).

SECTION I - RE-USED/RECYCLED MATERIALS

Include all recycling activities for source separated or mixed material recycling centers where recycling occurred.

Type of Material	Type of Activity	Facilities Used/Location	Total Truck Loads	Total Quantities		
(ex.) M	04	ABC Metals, Los Angeles	24	Tons	Cubic YD	Other Wt.
a. Total Diversion			0	0	0	0

SECTION 01 7419B
CONTRACTOR'S REUSE, RECYCLING, AND DISPOSAL REPORT
Continued

SECTION II - DISPOSED MATERIALS						
<i>Include all disposal activities for landfills, transfer stations, or inert landfills where no recycling occurred.</i>						
Type of Material	Type of Activity	Facilities Used/Location	Total Truck Loads	Total Quantities		
				Tons	Cubic YD	Other Wt.
(ex.) D	08	DEF Landfill, Los Angeles	2	35		
b. Total Disposal				0	0	0

SECTION III - TOTAL MATERIALS GENERATED						
<i>This section calculates the total materials generated during the project period (Reuse/Recycle + Disposal = Generation)</i>						
				Tons	Cubic YD	Other Wt.
a. Total Reused/Recycled				0	0	0
b. Total Disposed				0	0	0
c. Total Generated				0	0	0

SECTION IV - CONTRACTOR'S LANDFILL DIVERSION RATE CALCULATION						
<i>Add totals from Section I + Section II</i>						
	Tons	Cubic Yards	Other Wt.			
a. Materials Re-Used and Recycled	0					
b. Materials Disposed	0					
c. Total Materials Generated (a. + b. = c.)	0	0	0			
d. Landfill Diversion Rate (Tons Only)*	#DIV/0!					

* Use tons only to calculate recycling percentages: Tons Reused/Recycled/Tons Generated = % Recycled

Contractor's Comments (<i>Provide any additional information pertinent to planned reuse, recycling, or disposal activities</i>):						

Notes:

- Suggested Conversion Factors: From Cubic Yards to Tons (Use when scales are not available)
Asphalt: .61 (ex. 1000 CY Asphalt = 610 tons. Applies to broken chunks of asphalt)
Concrete: .93 (ex. 1000 CY Concrete = 930 tons. Applies to broken chunks of concrete)
Ferrous Metals: .22 (ex. 1000 CY Ferrous Metal = 220 tons)
Non-Ferrous Metals: .10 (ex. 1000 CY Non-Ferrous Metals = 100 tons)
Drywall Scrap: .20
Wood Scrap: .16

ALTERATION PROJECT PROCEDURES

PART 1 – GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Integration of Work, Purchase of Materials and Equipment, Uncovering of Work and Non-conforming Work and Correction of Work and Trenches;
- B. Special Conditions.

PART 2 - PRODUCTS

2.01 PRODUCTS FOR PATCHING AND EXTENDING WORK:

- A. New Materials: As specified in the Contract Documents including, without limitation, in the Specifications, Contractor shall match existing products, conditions, and work for patching and extending work.
- B. Type and Quality of Existing Products: Contractor shall determine by inspection, by testing products where necessary, by referring to existing conditions and to the Work as a standard.

PART 3 - EXECUTION

3.01 EXAMINATION:

- A. Contractor shall verify that demolition is complete and that areas are ready for installation of new Work.
- B. By beginning restoration Work, Contractor acknowledges and accepts the existing conditions.

3.02 PREPARATION:

- A. Contractor shall cut, move, or remove items as necessary for access to alterations and renovation Work. Contractor shall replace and restore these at completion.
- B. Contractor shall remove unsuitable material not as salvage unless otherwise indicated in the Contract Documents. Unsuitable material may include, without limitation, rotted wood, corroded metals, and deteriorated masonry and concrete. Contractor shall replace materials as specified for finished Work.

- C. Contractor shall remove debris and abandoned items from all areas of the Site and from concealed spaces.
- D. Contractor shall prepare surface and remove surface finishes to provide for proper installation of new Work and finishes.

3.03 INSTALLATION:

- A. Contractor shall coordinate Work of all alternations and renovations to expedite completion and to accommodate District occupancy.
- B. Designated Areas and Finishes: Contractor shall complete all installations in all respects, including operational, and electrical work.
- C. Contractor shall remove, cut, and patch Work in a manner to minimize damage and to provide a means of restoring Products and finishes to original or specified condition.
- D. Contractor shall refinish visible existing surfaces to remain to specified condition for each material, with a neat and square or straight transition to adjacent finishes.
- E. Contractor shall install products as specified in the Contract Documents, including without limitation, the Specifications.

3.04 TRANSITIONS:

- A. Where new Work abuts or aligns with existing, Contractor shall perform a smooth and even transition. Patched Work must match existing adjacent work in texture and appearance.
- B. When finished surfaces are cut so that a smooth transition with new Work is not possible, Contractor shall terminate existing surface along a straight line at a natural line of division and make a recommendation for resolution to the District and the Architect for review and approval.

3.05 ADJUSTMENTS:

- A. Where a change of plane of 1/4 inch or more occurs, Contractor shall submit a recommendation for providing a smooth transition to the District and the Architect for review and approval.
- B. Contractor shall fit Work at penetrations of surfaces.

3.06 REPAIR OF DAMAGED SURFACES:

- A. Contractor shall patch or replace portions of existing surfaces, which are damaged, lifted, discolored, or showing other imperfections, in the area where the Work is performed.
- B. Contractor shall repair substrate prior to patching finish.

3.07 CULTIVATED AREAS AND OTHER SURFACE IMPROVEMENTS:

- A. Cultivated or planted areas and other surface improvements which are damaged by actions of the Contractor shall be restored by Contractor to their original condition or better, where indicated.
- B. Contractor shall protect and replace, if damaged, all existing guard posts, barricades, and fences.
- C. Contractor shall give special attention to avoid damaging or killing trees, bushes and/or shrubs on the Premises and/or identified in the Contract Documents, including without limitation, the Drawings.

3.08 FINISHES:

- A. Contractor shall finish surfaces as specified in the Contract Documents, including without limitations, the provisions of all Divisions of the Specifications.
- B. Contractor shall finish patches to produce uniform finish and texture over entire area. When finish cannot be matched, Contractor shall refinish entire surface to nearest intersections.

3.09 CLEANING:

- A. Contractor shall continually clean the Site and the Premises as indicated in the Contract Documents, including without limitation, the provisions in the General Conditions and the Specifications regarding cleaning.

END OF DOCUMENT

CONTRACT CLOSEOUT AND FINAL CLEANING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Completion of Work;
- B. Special Conditions;
- C. Temporary Facilities and Controls.

1.02 CLOSEOUT PROCEDURES

Contractor shall comply with all closeout provisions as indicated in the General Conditions.

1.03 FINAL CLEANING

- A. Contractor shall execute final cleaning prior to final inspection.
- B. Contractor shall clean interior and exterior glass and all surfaces exposed to view; remove temporary labels, tape, stains, and foreign substances, polish transparent and glossy surfaces, wax and polish new vinyl floor surfaces, vacuum carpeted and soft surfaces.
- C. Contractor shall clean equipment and fixtures to a sanitary condition.
- D. Contractor shall replace filters of operating equipment.
- E. Contractor shall clean debris from roofs, gutters, down spouts, and drainage systems.
- F. Contractor shall clean Site, sweep paved areas, and rake clean landscaped surfaces.
- G. Contractor shall remove waste and surplus materials, rubbish, and construction facilities from the Site and surrounding areas.

1.04 ADJUSTING

Contractor shall adjust operating products and equipment to ensure smooth and unhindered operation.

1.05 RECORD DOCUMENTS AND SHOP DRAWINGS

- A. Contractor shall legibly mark each item to record actual construction, including:
 - (1) Measured depths of foundation in relation to finish floor datum.
 - (2) Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permit surface improvements.
 - (3) Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.
 - (4) Field changes of dimension and detail.
 - (5) Details not on original Contract Drawings
 - (6) Changes made by modification(s).
 - (7) References to related Shop Drawings and modifications.
- B. Contractor will provide one set of Record Drawings to District.
- C. Contractor shall submit all required documents to District and/or Architect prior to or with its final Application for Payment.

1.06 INSTRUCTION OF DISTRICT PERSONNEL

- A. Before final inspection, at agreed upon times, Contractor shall instruct District's designated personnel in operation, adjustment, and maintenance of products, equipment, and systems.
- B. For equipment requiring seasonal operation, Contractor shall perform instructions for other seasons within six months or by the change of season.
- C. Contractor shall use operation and maintenance manuals as basis for instruction. Contractor shall review contents of manual with personnel in detail to explain all aspects of operation and maintenance.
- D. Contractor shall prepare and insert additional data in Operation and Maintenance Manual when the need for such data becomes apparent during instruction.
- E. Contractor shall review contents of manual with personnel in detail to explain all aspects of operation and maintenance.

1.07 SPARE PARTS AND MAINTENANCE MATERIALS

- A. Contractor shall provide products, spare parts, maintenance, and extra materials in quantities specified in the Specifications and in Manufacturer's recommendations.

- B. Contractor shall provide District with all required Operation and Maintenance Data at one time. Partial or piecemeal submissions of Operation and Maintenance Data will not be accepted.

PART 2 – PRODUCTS Not Used.

PART 3 – EXECUTION Not Used.

END OF DOCUMENT

OPERATION AND MAINTENANCE DATA

PART 1 – GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Completion of the Work;
- B. Special Conditions.

1.02 QUALITY ASSURANCE:

Contractor shall prepare instructions and data by personnel experienced in maintenance and operation of described products.

1.03 FORMAT:

- A. Contractor shall prepare data in the form of an instructional manual entitled "OPERATIONS AND MAINTENANCE MANUAL & INSTRUCTIONS" ("Manual").
- B. Binders: Contractor shall use commercial quality, 8-1/2 by 11 inch, three-side rings, with durable plastic covers; two inch maximum ring size. When multiple binders are used, Contractor shall correlate data into related consistent groupings.
- C. Cover: Contractor shall identify each binder with typed or printed title "OPERATION AND MAINTENANCE MANUAL & INSTRUCTIONS"; and shall list title of Project and identify subject matter of contents.
- D. Contractor shall arrange content by systems process flow under section numbers and sequence of Table of Contents of the Contract Documents.
- E. Contractor shall provide tabbed fly leaf for each separate product and system, with typed description of product and major component parts of equipment.
- F. Text: The content shall include Manufacturer's printed data, or typewritten data on 24 pound paper.
- G. Drawings: Contractor shall provide with reinforced punched binder tab and shall bind in with text; folding larger drawings to size of text pages.

1.04 CONTENTS, EACH VOLUME:

- A. Table of Contents: Contractor shall provide title of Project; names, addresses, and telephone numbers of the Architect, any engineers, subconsultants, Subcontractor(s), and Contractor with name of responsible parties; and schedule of products and systems, indexed to content of the volume.

- B. For Each Product or System: Contractor shall list names, addresses, and telephone numbers of Subcontractor(s) and suppliers, including local source of supplies and replacement parts.
- C. Product Data: Contractor shall mark each sheet to clearly identify specific products and component parts, and data applicable to installation. Delete inapplicable information.
- D. Drawings: Contractor shall supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams. Contractor shall not use Project Record Documents as maintenance drawings.
- E. Text: Contractor shall include any and all information as required to supplement product data. Contractor shall provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions.
- F. Warranties and Bonds: Contractor shall bind in one copy of each.

1.05 MANUAL FOR MATERIALS AND FINISHES:

- A. Building Products, Applied Materials, and Finishes: Contractor shall include product data, with catalog number, size, composition, and color and texture designations. Contractor shall provide information for re-ordering custom manufactured products.
- B. Instructions for Care and Maintenance: Contractor shall include Manufacturer's recommendations for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.
- C. Moisture Protection and Weather Exposed Products: Contractor shall include product data listing applicable reference standards, chemical composition, and details of installation. Contractor shall provide recommendations for inspections, maintenance, and repair.
- D. Additional Requirements: Contractor shall include all additional requirements as specified in the Specifications.
- E. Contractor shall provide a listing in Table of Contents for design data, with tabbed fly sheet and space for insertion of data.

1.06 MANUAL FOR EQUIPMENT AND SYSTEMS:

- A. Each Item of Equipment and Each System: Contractor shall include description of unit or system, and component parts and identify function, normal operating characteristics, and limiting conditions. Contractor shall include performance curves, with engineering data and tests, and complete nomenclature, and commercial number of replaceable parts.
- B. Panelboard Circuit Directories: Contractor shall provide electrical service characteristics, controls, and communications.

- C. Contractor shall include color coded wiring diagrams as installed.
- D. Operating Procedures: Contractor shall include start-up, break-in, and routine normal operating instructions and sequences. Contractor shall include regulation, control, stopping, shut-down, and emergency instructions. Contractor shall include summer, winter, and any special operating instructions.
- E. Maintenance Requirements: Contractor shall include routine procedures and guide for trouble-shooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.
- F. Contractor shall provide servicing and lubrication schedule, and list of lubricants required.
- G. Contractor shall include manufacturer's printed operation and maintenance instructions.
- H. Contractor shall include sequence of operation by controls manufacturer.
- I. Contractor shall provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.
- J. Contractor shall provide control diagrams by controls manufacturer as installed.
- K. Contractor shall provide Contractor's coordination drawings, with color coded piping diagrams as installed.
- L. Contractor shall provide charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams.
- M. Contractor shall provide list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.
- N. Additional Requirements: Contractor shall include all additional requirements as specified in Specification(s).
- O. Contractor shall provide a listing in Table of Contents for design data, with tabbed fly sheet and space for insertion of data.

1.07 SUBMITTAL:

- A. Contractor shall submit to the District for review two (2) copies of preliminary draft or proposed formats and outlines of the contents of the Manual within thirty (30) days of Contractor's start of Work.
- B. For equipment, or component parts of equipment put into service during construction and to be operated by District, Contractor shall submit draft content for that portion of the Manual within ten (10) days after acceptance of that equipment or component.

- C. Contractor shall submit two (2) copies of a complete Manual in final form prior to final Application for Payment. Copy will be returned with Architect/Engineer comments. Contractor must revise the content of the Manual as required by District prior to District's approval of Contractor's final Application for Payment.
- D. Contractor must submit two (2) copies of revised Manual in final form within ten (10) days after final inspection.

PART 2 – PRODUCTS Not Used.

PART 3 – EXECUTION Not Used.

END OF DOCUMENT

WARRANTIES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Warranty/Guarantee Information;
- B. Special Conditions.

1.02 FORMAT

- A. Binders: Contractor shall use commercial quality, 8-1/2 by 11 inch, three-side rings, with durable plastic covers; two inch maximum ring size.
- B. Cover: Contractor shall identify each binder with typed or printed title "WARRANTIES" and shall list title of Project.
- C. Table of Contents: Contractor shall provide title of Project; name, address, and telephone number of Contractor and equipment supplier; and name of responsible principal. Contractor shall identify each item with the number and title of the specific Specification, document, provision, or section in which the name of the product or work item is specified.
- D. Contractor shall separate each warranty with index tab sheets keyed to the Table of Contents listing, providing full information and using separate typed sheets as necessary. Contractor shall list each applicable and/or responsible Subcontractor(s), supplier(s), and/or manufacturer(s), with name, address, and telephone number of each responsible principal(s).

1.03 PREPARATION:

- A. Contractor shall obtain warranties, executed in duplicate by each applicable and/or responsible subcontractor(s), supplier(s), and manufacturer(s), within ten (10) days after completion of the applicable item or work. Except for items put into use with District's permission, Contractor shall leave date of beginning of time of warranty blank until the date of completion is determined.
- B. Contractor shall verify that documents are in proper form, contain full information, and are notarized, when required.
- C. Contractor shall co-execute submittals when required.
- D. Contractor shall retain warranties until time specified for submittal.

1.04 TIME OF SUBMITTALS:

- A. For equipment or component parts of equipment put into service during construction with District's permission, Contractor shall submit a draft warranty for that equipment or component within ten (10) days after acceptance of that equipment or component.
- B. Contractor shall submit for District approval all warranties and related documents within ten (10) days after date of completion. Contractor must revise the warranties as required by the District prior to District's approval of Contractor's final Application for Payment.
- C. For items of work delayed beyond date of completion, Contractor shall provide an updated submittal within ten (10) days after acceptance, listing the date of acceptance as start of warranty period.

PART 2 - PRODUCTS Not Used.

PART 3 – EXECUTION Not Used.

END OF DOCUMENT

(Letterhead of Contractor)

STANDARD GUARANTEE / WARRANTY

for

Project Name

Contract No.

We hereby warrant that the Work we have provided under the above reference Contract has been completed in accordance with the Drawings, Specifications, and other Contract Documents.

Under the terms of this warranty, we agree to repair or replace any or all of our work, together with any other adjacent work which may be displaced or damaged by so doing, which may prove to be either patently defective in its workmanship or latently defective in its workmanship or materials within the period of 24 months from the date of filing of the Notice of Completion of the above named Project by the Board of Trustees of the School District, and we also agree to repair any and all damages resulting from such defects, without any expense whatsoever to said Board of Trustees, ordinary wear and tear and unusual abuse or neglect excepted.

In the event of our failure to comply with above-mentioned guarantee conditions within ten (10) day after being notified in writing by the Owner, we collectively and separately do hereby authorize the Owner to have said defective work and damages repaired or replaced and made good at our expense and will honor and pay the costs and charges therefore upon demand.

SIGNED (Contractor) _____

(Address)

(Printed Name of Authorized Representative)

Signature

(License Number)

(Date of Signing)

COUNTERSIGNED (Owner) _____

(Printed Name of Authorized Representative)

Signature

Date of Filing or Notice of Completion: _____

(Letterhead of Company)

SUBCONTRACTOR STANDARD GUARANTEE / WARRANTY

We hereby warrant that

which we have provided in _____

for _____

has been completed in accordance with Specification Section _____ and requirements of the Contract Documents.

Under the terms of this warranty, we agree to repair or replace any or all of our work, together with any other adjacent work which may be displaced or damaged by so doing, which may prove to be either patently defective in its workmanship or latently defective in its workmanship or materials within a period of 24 months from date of filing the Notice of Completion of the above-named Project by the Board of Trustees of the School District without any expense whatsoever to said Board of Trustees, ordinary wear and tear and unusual abuse or neglect excepted.

In the event of our failure to comply with above-mentioned guarantee conditions within ten (10) day after being notified in writing by the Owner, we collectively and separately do hereby authorize the Owner to have said defective work and damages repaired or replaced and made good at our expense and will honor and pay the costs and charges therefore upon demand.

SIGNED (Subcontractor)

(Signature)

(Company Name)

(Address)

(License Number) _____ (Date of Signing)

COUNTERSIGNED (General Contractor)

(Signature)

(Company Name)

(Address)

(License Number) _____ (Date of Signing)

(Letterhead of Company)

SPECIAL EXTENDED WRITTEN GUARANTEE / WARRANTY

We hereby warrant that

which we have provided in _____
Name of Project

for _____ District

has been completed in accordance with Specification Section _____ and requirements of the Contract Documents.

Under the terms of this warranty, we agree to repair or replace any or all of our work, together with any other adjacent work which may be displaced or damaged by so doing, which may prove to be either patently defective in its workmanship or latently defective in its workmanship or materials within a period of _____ year(s) from date of filing the Notice of Completion of the above-named Project by the Board of Trustees of the School District without any expense whatsoever to said Board of Trustees, ordinary wear and tear and unusual abuse or neglect excepted. We also agree to repair any and all damages resulting from such defects.

In the event of our failure to comply with above-mentioned conditions within a reasonable time but in no case longer than ten (10) calendar days after being notified in writing by the Owner, we collectively and separately do hereby authorize the Owner to have said defective work and damages repaired or replaced and made good at our expense and will honor and pay the costs and charges therefore upon demand.

SIGNED (Subcontractor)	
------------------------	--

(Name)

(Address)

 (License Number) (Date of Signing)

(License Number) (Date of Signing)

COUNTERSIGNED (General Contractor)

(Name)

(Address)

(License Number) (Date of Signing)

(License Number) (Date of Signing)

RECORD DOCUMENTS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Documents on Work;
- B. Special Conditions.

PART 2 - RECORD DRAWINGS

2.01 GENERAL:

- A. As indicated in the Contract Documents, the District will provide Contractor with one set of reproducible, full size original Contract Drawings (mylars).
- B. Contractor shall maintain at each Project Site one set of marked-up plans and shall transfer all changes and information to those marked-up plans, as often as required in the Contract Documents, but in no case less than once each month. Contractor shall submit to the Project Inspector one set of reproducible vellums of the Project Record Drawings ("As-Built") showing all changes incorporated into the Work since the preceding monthly submittal. The As-Built shall be available at the Project Site. The Contractor shall submit reproducible vellums at the conclusion of the Project following review of the blue line prints.
- C. Label and date each Record Drawing "RECORD DOCUMENT" in legibly printed letters.
- D. All deviations in construction, including but not limited to pipe and conduit locations and deviations caused by without limitation Change Orders, Construction Claim Directives, RFI's, and Addenda, shall be accurately and legibly recorded by Contractor.
- E. Locations and changes shall be done by Contractor in a neat and legible manner and, where applicable, indicated by drawing a "cloud" around the changed or additional information.

2.02 RECORD DRAWING INFORMATION:

- A. Contractor shall record the following information:
 - (1) Locations of Work buried under or outside each building, including, without limitation, all utilities, plumbing and electrical lines, and conduits.

- (2) Actual numbering of each electrical circuit to match panel schedule.
- (3) Locations of significant Work concealed inside each building whose general locations are changed from those shown on the Contract Drawings.
- (4) Locations of all items, not necessarily concealed, which vary from the Contract Documents.
- (5) Installed location of all cathodic protection anodes.
- (6) Deviations from the sizes, locations, and other features of installations shown in the Contract Documents.
- (7) Locations of underground work, points of connection with existing utilities, changes in direction, valves, manholes, catch basins, capped stubouts, invert elevations, etc.
- (8) Sufficient information to locate Work concealed in each building with reasonable ease and accuracy.

In some instances, this information may be recorded by dimension. In other instances, it may be recorded in relation to the spaces in the building near which it was installed.

- B. Contractor shall provide additional drawings as necessary for clarification.
- C. Contractor shall provide reproducible record drawings, made from final Shop Drawings marked "No Exceptions Taken" or "Approved as Noted."
- D. After review and approval of the marked-up specifications by the Project Inspector, Contractor shall provide electronic copies of the drawings (in PDF format) with one file with all of the sheets and one set of individual sheet files at the conclusion of the Project.

PART 3 - RECORD SPECIFICATIONS

3.01 GENERAL:

- A. Contractor shall mark each section legibly to record manufacturer, trade name, catalog number, and supplier of each Product and item of equipment actually installed.
- B. After review and approval of the marked-up specifications by the Project Inspector, Contractor shall provide one electronic copy of the specifications (in PDF format) at the conclusion of the Project.

PART 4 - MAINTENANCE OF RECORD DOCUMENTS

4.01 GENERAL

- A. Contractor shall store Record Documents apart from documents used for construction as follows:

- (1) Provide files and racks for storage of Record Documents.
- (2) Maintain Record Documents in a clean, dry, legible condition and in good order.

B. Contractor shall not use Record Documents for construction purposes.

PART 5 – PRODUCTS Not Used.

END OF DOCUMENT

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes general requirements and procedures for compliance with California Code of Regulations, Title 24, Part 11 California Green Building Standards Code, "CAL-Green".

- 1. Chapter 5- Non-Residential Mandatory Measures.

1.2 RELATED REQUIREMENTS

- A. Pertinent sections specifying erosion control.
- B. Section 01 6116, Volatile Organic Compound (VOC) Restrictions.
- C. Section 01 7419, Construction Waste Management and Disposal.
- D. Section 01 7700, Closeout Procedures.

1.3 DEFINITIONS

- A. CAL-Green Definitions: Certain terms are defined by CAL-Green in Chapter 5 of the code. Words and terms used in this section shall have the meanings shown therein.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Respond to questions and requests from Architect and the jurisdiction having authority regarding CAL-Green credits that are the responsibility of the Contractor, that depend on product selection or product qualities, or that depend on Contractor's procedures. Document responses as informational submittals.

1.5 SUBMITTALS

- A. CAL-GREEN Submittals: Submit CAL-GREEN submittals required by code and in other Specification Sections.
 - 1. CAL-GREEN submittals are in addition to other submittals. If submitted item is identical to that submitted to comply with other requirements, submit duplicate copies as a separate submittal to verify compliance with indicated CAL-GREEN requirements.
 - 2. Acceptable verification submittals are specified in the related sections.

SUSTAINABLE DESIGN REQUIREMENTS
SECTION 01 8113.10
3595001

PART 2 - PRODUCTS

2.1 REQUIREMENTS - GENERAL

- A. Provide products and procedures necessary to confirm CAL-GREEN compliance required in this Section. Although other Sections may specify some CAL-GREEN requirements, the Contractor shall determine additional materials, techniques, means, methods and procedures necessary to comply with CAL-GREEN requirements.

2.2 STORM WATER POLLUTION PREVENTION PLAN

- A. Section 5.106.1: Comply with requirements of this code section, local ordinances, General Conditions, Special Provisions, and related sections specifying erosion control.

2.3 OUTDOOR WATER USE

- A. Section 5.304.3.1: Irrigation Controllers: Comply with requirements of this code section, local ordinances and Section 32 8000.

2.4 CONSTRUCTION WASTE REDUCTION

- A. Section 5.408 Construction Waste Management, Diversion and Recycling: Comply with requirements of this code section, local ordinances and Section 01 7419.

2.5 BUILDING MAINTENANCE AND OPERATION

- A. Section 5.410.2.5. Documentation and Training: Provide Operations Training as required by these code sections and as specified in Section 01 7700 and Systems Manual as specified in Section 01 7700.

2.6 POLLUTANT CONTROL

- A. Section 5.504.3 Indoor Air Quality: Comply with requirements of this code section, local ordinances and Section 01 3543.
 - 1. During storage, rough installation and until final start-up of HVAC equipment, securely cover all ducts and air distribution component openings with plastic, tape, sheet metal or other methods acceptable to enforcing agency to reduce dust or debris collected in the system.
- B. Section 5.504.4 Finish Material Pollutant Control: All Finish materials shall comply with requirements of this code section, local ordinances and Section 01 6116.

PART 3 - EXECUTION

3.1 GENERAL

- A. Comply with Section 01 7419, Construction Waste Management and Disposal.

SUSTAINABLE DESIGN REQUIREMENTS
SECTION 01 8113.10
3595001

- B. Comply with execution requirements of related sections and applicable local codes and ordinances.

END OF SECTION

*p:\sacramento\3595 tracy unified school district\001-000_villalovoz es new shade structures\08 specifications\06 spec\04 final\freiler
- shade struct\01 8113.10_sustainable design requirements (cal-green).docx
Last Updated: April 8, 2019*

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Gypsum board, including finishing.

1.2 RELATED REQUIREMENTS

- A. Section 01 6116, Volatile Organic Compound (VOC) Restrictions; for VOC limits pertaining to adhesives, sealants, fillers, primers, and coatings.
- B. Section 01 8113, Sustainable Design Requirements, for CAL-Green general requirements and procedures.
- C. Section 09 9100, Painting.

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CAL Green), edition as noted on drawings, as adopted by the California Division of the State Architect (DSA).
- C. ASTM International (ASTM):
 - 1. C11: Standard Terminology Relating to Gypsum and related Building Materials and Systems.
 - 2. C473: Standard Test Methods for Physical Testing of Gypsum Panel Products.
 - 3. C475/C475M: Specification for Joint Treatment Materials for Gypsum Wallboard Construction.
 - 4. C557: Specification for Adhesives for Fastening Gypsum Wallboard to Wood Framing.
 - 5. C840: Standard Specification for Application and Finish of Gypsum Board.
 - 6. C1047: Specification for Accessories for Gypsum Wallboard and Gypsum Veneer Base.
 - 7. C1177/C1177M: Specification for Joint Treatment Materials for Gypsum Wallboard Construction.
 - 8. C1396: "Specification for Gypsum Board.
 - 9. C1629/C1629M: Standard Classification for Abuse-Resistant Nondecorated Interior Gypsum Panel Products and Fiber-Reinforced Cement Panels.
 - 10. D3273: Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber.
 - 11. E84: Standard Test Method for Surface Burning Characteristics of Building Materials.

GYPSUM BOARD
SECTION 09 2900
3595001

12. E119: Method for Fire Tests of Building Construction and Materials.

D. Gypsum Association (GA):

1. GA-600: Gypsum Fire Resistance Design Manual.
2. GA-214: Recommended Levels of Finish for Gypsum Board, Glass Mat & Fiber-Reinforced Gypsum Panels.
3. GA-216: Application and Finishing of Gypsum Panel Products.

E. Underwriters Laboratories (UL): Fire Resistance Directory.

1.4 DEFINITIONS

A. Gypsum Board Construction Terminology: Refer to ASTM C11 for definitions of terms for gypsum board construction not defined in this Section or in other referenced standards.

1.5 ADMINISTRATIVE REQUIREMENTS

A. Submittal Procedures:

1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
3. Sustainable Design Submittals shall comply with the additional requirement of Section 01 8113, Sustainable Design Requirements.

B. Coordinate work to avoid delays and interference with work of mechanical, electrical and other trades.

1.6 ACTION SUBMITTALS

A. Product Data: Submit list and complete descriptive data of all products proposed for use. Include manufacturer's specifications, published warranty or guarantee, installation instructions, and maintenance instructions.

B. Samples: Submit sample for each type of finish texture to Architect for review.

1.7 INFORMATIONAL SUBMITTALS

A. Sustainable Design:

1. General:
 - a. Submit information necessary to establish and document compliance with the California Green Building Standards Code.
 - b. Sustainable design submittals are in addition to other submittals.
2. The following information shall be provided:
 - a. Adhesives and Sealants: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.

- b. Paints and Coatings: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.

- B. Statement of installer qualifications, if requested by Architect.

1.8 QUALITY ASSURANCE

- A. Use only new materials and products.
- B. Use materials and products of one manufacturer whenever possible.
- C. Materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.
- D. Workmanship shall be of highest quality. Joints, corners, screws and nail heads shall be finished with long tapered finish, smooth and even in texture. Surfaces shall be prepared to receive paint finish.

1.9 DELIVERY, STORAGE AND HANDLING

- A. Deliver undamaged products to job in manufacturer's sealed containers and/or original bundles with tags and labels intact.
- B. Store materials in protected, dry conditions off of ground and in areas so as to not interfere with the progress of the work.
- C. Transport, store and handle in strict accord with the manufacturer's written recommendations. Materials are to be neatly stacked flat, avoiding undue sag or damaged to board surfaces or edges.

1.10 FIELD CONDITIONS

- A. Do not install wallboard or joint compounds when building temperature is below 55 degrees F or if proper ventilation is not provided to eliminate excessive moisture from building.

PART 2 - PRODUCTS

2.1 DESIGN AND PERFORMANCE CRITERIA

- A. Fire-Resistance-Rated Assemblies: For fire-resistance-rated assemblies, provide materials and install wallboard assembly identical to those tested in assembly indicated according to ASTM E119 by an independent testing agency.
- B. Sustainable Design:
 - 1. VOC emissions for field-applied adhesives, sealants, and sealant primers must comply with limits specified in Section 01 6116.
 - 2. VOC emissions for field-applied paints and coatings must comply with limits specified in Section 01 6116.

GYPSUM BOARD
SECTION 09 2900
3595001

2.2 INTERIOR GYPSUM BOARD PANELS

- A. Gypsum Wallboard: ASTM C1396 Type "X" fire rated with UL label; USG "Sheetrock Firecode," Georgia-Pacific "Fireguard Gypsum Board Type X", National Gypsum "Board Gold Bond Fire-Shield," or equal.
 - 1. Thickness: 5/8 inch unless otherwise shown.
 - 2. Long Edges: Tapered and featured (rounded or beveled) for prefilling.
 - 3. Locations of Use: Walls except as otherwise noted.
- B. Moisture and Mold-Resistant Gypsum Wallboard: ASTM C1396 Type "X" fire rated with UL label; USG "Sheetrock Mold Tough Firecode Core," or equal.
 - 1. Thickness: 5/8 inch unless otherwise shown.
 - 2. Long Edges: Tapered and featured (rounded or beveled) for prefilling.
 - 3. Mold Resistance: 10 on scale of 10 when tested in accordance with ASTM D3273.
 - 4. Moisture Resistance: The average water absorption for panels shall not exceed 5 percent by weight after two-hour immersion when tested in accordance with ASTM C473.
 - 5. Locations of Use:
 - a. Walls at restrooms, where wall will receive FRP finish, and other locations as shown.
 - b. Do not use behind ceramic tile.
 - c. See Section 09 3000, Tiling, for ceramic tile backing.
 - 6. Limitations:
 - a. Avoid exposure to sustained temperatures exceeding 125 degrees F.
 - b. Avoid exposure to excessive, repetitive or continuous moisture before, during and after installation. Eliminate sources of moisture immediately.
 - c. Not suitable for use as a substrate for tile in wet areas such as tubs and showers, gang showers and other areas subject to direct water exposure.

2.3 ACCESSORIES

- A. Fasteners:
 - 1. Screws:
 - a. Gypsum wallboard to wood, use 1-1/4 inch length, bugle head. Second layer of gypsum wallboard to wood use 2 inch length.
 - 2. Other fastener types as required and recommended by gypsum wallboard manufacturer, applicable CBC requirements, and in accordance with the specified standards.
 - 3. Spacing shall be in accordance with the CBC.
- B. Joint System Materials: Conform to ASTM C475.
 - 1. Tape: USG Sheetrock Brand Joint Tape, or equal.
 - 2. Joint compound: USG Sheetrock Brand Joint Compound - Taping, or equal.

3. Joint finishing compound: USG Sheetrock Brand Joint Compound - Topping, or equal.
- C. Sealants:
 1. Interior Wall Sealant: Highly elastic, water-based compound, non-bleeding, non-staining, pumpable and easily applied in beads, and specifically formulated for acoustical sealing; Tremco Acoustical Sealant, Presstite 579.64; or equal.
- D. Adhesives:
 1. Laminating Adhesive: As recommended by gypsum board manufacturer for laminating gypsum board together in fire-rated construction.
 2. Application to Wood Framing: Certified in accordance with ASTM C557.
 3. Adhesives shall comply with required VOC regulations.
- E. Primer/sealer: As specified in Section 09 9100, Painting.
- F. Spray-on Texture Coating: USG "Texture XII Drywall Surfacers," or equal.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Check framing for accurate spacing and alignment. Surfaces shall be checked for surface damage, defects or uneven walls. Uneven walls shall mean those that are not straight, plumb or of even true plane
- B. Verify that spacing of installed framing does not exceed maximum allowable for thickness of gypsum board to be used.
- C. Unacceptable conditions shall be corrected prior to application gypsum board.

3.2 INSTALLATION OF GYPSUM BOARD

- A. General: Comply with ASTM C840, GA-216, and CBC. Where UL designs are indicated on the Drawings for fire-rated partitions, comply with UL requirements, except where exceeded by other requirements.
- B. Board Arrangement Layout: Conform to layouts and requirements indicated; use long boards to restrict joints to minimum. Conditions met and not covered by the Drawings and Specifications shall be resolved in conformity with best practice of trade.
- C. Joints: Butt sheets loosely together with tapered edges always placed together (butt edges placed next to tapered edges are not permitted). Sand or kerf cut edges and mill ends to provide smooth jointing on exposed face. Stagger end joints. Shim wallboard on wood framing to get even joints without offsets.
- D. Fasteners: Place fasteners no less than 3/8 inch from edges of boards. Install fasteners with heads dimpled slightly below surface; do not cut through paper. Use crown face

GYPSUM BOARD
SECTION 09 2900
3595001

hammers for driving nails and approved power tools for self drilling screws. Fasten gypsum wallboard to bearings as follows:

1. Ceilings, Non-rated: Screws 12 inches on center.
 2. Walls, Non-rated: Screws 12 inches on center.
- E. Ceilings: Place boards with long dimension at right angles to supports and end joint occurring over supports. On fire-rated ceilings butted end joints may be placed between supports and reinforced on upper side with 8 inch wide wallboard back up strips set in approved adhesive. Place perimeters of ceilings and edges of openings over solid bearing members.
- F. Cutting and scribing: Cut neatly to fit around outlets, switch boxes and other protrusions, using keyhole saw or specially designed cutting tool for opening of exact shape and size needed.
- G. Trim: Edge exterior corners with specified bead set to true plumb line. Where board joins or abuts a material other than gypsum board, cover end of board with specified metal casing, leaving joint sufficient for installation of sealant. Attach trim with nails at wood studs at 9 inches on center each flange, and type S-12 screws at steel studs at 9 inch on center each flange. No clenching allowed.
- H. Interior Wall Sealant: At interior partitions, use double bead of specified material. Install at floors, wall intersections, where walls abut other materials and at electrical boxes. Apply in accord with manufacturer's printed directions.

3.3 FINISHING

- A. Level of Finishes: In accordance with GA-214.
1. General:
 - a. Finish joints, screw/nail heads or fastener depressions, applied metal trim and surface blemishes, applying tape and compounds in strict accord with manufacturer's printed directions.
 - b. Exposed wallboard shall be finished and sanded as necessary to provide flat, smooth surface ready for decoration and the Finish Levels noted below.
 - c. Primer/sealer, where indicated, is in addition to first coat of primer/sealer in Section 09 9100, Painting.
 2. Level 3 Finish: Provide for finishes with medium to heavy textures. Provide one coat of drywall primer/sealer at prepared surfaces prior to application of final finish.
 3. Level 5 Finish: Provide for gypsum wallboard surfaces with non-textured finishes, and as scheduled on the Drawings, unless otherwise noted.

3.4 ADDITIONAL INSTALLATION REQUIREMENTS

- A. Accessories and Light Fixture Protection: Wherever accessories, panels and recessed light fixtures penetrate fire-rated gypsum wallboard, provide protection box assembly in accordance with UL specifications and as detailed to maintain integrity of rated wall/ceiling system.

- B. Fill voids at wall/floor joints greater than 3/16 inch to provide solid backing for floor base.

3.5 PROTECTION

- A. Protect work and materials of this Section prior to and during installation and protect the installed work and materials of other trades.
- B. In the event of damage, immediately make all repairs and replacements necessary to the approval of the Architect at no additional cost to the Owner.

3.6 CLEAN-UP

- A. Remove all empty containers, scraps of material and all other debris, and leave premises broom clean. Clean all adjoining work spotted or otherwise defaced by this operation.

END OF SECTION

*p:\sacramento\3595 tracy unified school district\001-000_villalovoz es new shade structures\08 specifications\06 spec\04
final\jacobson - shade struct\09 2900_gypsum board.docx
Last Updated: March 26, 2021*

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Ceramic tile.
 - 2. Cementitious backing panels.
 - 3. Setting and grout materials.
 - 4. Waterproof / crack isolation membranes.
 - 5. Miscellaneous materials.

1.2 RELATED REQUIREMENTS

- A. Section 01 6116, Volatile Organic Compound (VOC) Restrictions, for VOC limits pertaining to adhesives, sealants, fillers, primers, and coatings.
- B. Section 01 8113, Sustainable Design Requirements, for CALGreen general requirements and procedures.
- C. Section 08 3113, Access Doors and Frames, for access doors in tiled wall assemblies.

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CALGreen), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- C. 36 CFR 1191 - Americans with Disabilities Act Accessibility Guidelines for Buildings and Facilities; Final Rule; Federal Register, July 26, 1991; updated 2010.
- D. American National Standards Institute (ANSI) / Tile Council of North America (TCNA):
 - 1. A108-A118-A136.1: Tile Industry Specifications.
 - 2. A137.1: Tile Specifications.
- E. ASTM International (ASTM):
 - 1. A153/A153M: Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
 - 2. A666: Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar.

TILING
SECTION 09 3000
3595001

3. A1064/A1064M: Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete.
4. C627: Standard Test Method for Evaluating Ceramic Floor Tile Installation Systems Using the Robinson-Type Floor Tester.
5. C1325: Standard Specification for Fiber-Mat Reinforced Cementitious Backer Units.
6. D4068: Standard Specification for Chlorinated Polyethylene (CPE) Sheeting for Concealed Water-Containment Membrane.
7. E90: Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements.
8. E96/E96M: Standard Test Methods for Gravimetric Determination of Water Vapor Transmission Rate of Materials.
9. E303: Standard Test Method for Measuring Surface Frictional Properties Using the British Pendulum Tester.
10. E413: Classification for Rating Sound Insulation.
11. E492: Standard Test Method for Laboratory Measurement of Impact Sound Transmission Through Floor-Ceiling Assemblies Using the Tapping Machine.
12. E989: Standard Classification for Determination of Single-Number Metrics for Impact Noise.
13. E1007: Standard Test Method for Field Measurement of Tapping Machine Impact Sound Transmission Through Floor-Ceiling Assemblies and Associated Support Structures.
14. E2179: Standard Test Method for Laboratory Measurement of the Effectiveness of Floor Coverings in Reducing Impact Sound Transmission Through Concrete Floors.

F. Tile Council of North America (TCNA):

1. Handbook for Ceramic, Glass and Stone Tile Installation, current edition.

1.4 DEFINITIONS

- A. General: Definitions in the ANSI A108 series of tile installation standards and in ANSI/TCNA A137.1 apply to work of this Section unless otherwise specified.
- B. Module Size: Actual tile size plus joint width indicated.
- C. Face Size: Actual tile size, excluding spacer lugs.
- D. Large Format Tile: Tile that is greater than 15 inches in width or length.
- E. Wet Area: Includes tile surfaces that are either soaked, saturated, or regularly and frequently subjected to moisture such as tub enclosures, showers, swimming pools, commercial kitchens and exterior areas.

1.5 ADMINISTRATIVE REQUIREMENTS

- A. Submittal Procedures:

1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
3. Sustainable Design Submittals shall comply with the additional requirement of Section 01 8113, Sustainable Design Requirements.

1.6 ACTION SUBMITTALS

- A. Product Data:
 1. Manufacturer's product literature for all manufactured products to demonstrate compliance with specified attributes.
 2. Installation instructions for cement backer board, exterior fiber cement board, trim, and accessories.
 3. Installation instructions for manufactured setting and grouting products.
- B. Samples: The following samples are required.
 1. Sample for each type of tile and grout indicated.
 2. Manufacturer's full range of colors for Architect's selection. No additional cost allowance will be permitted for premium colors within manufacturer's full range.
 3. Samples of accessories involving color selection.
 4. Samples of crack isolation membranes, waterproof membranes and backer boards.

1.7 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For installer.
- B. Sample of manufacturer's warranty.
- C. Sustainable Design:
 1. General:
 - a. Submit information necessary to establish and document compliance with the California Green Building Standards Code.
 - b. Sustainable design submittals are in addition to other submittals.
 2. The following information shall be provided:
 - a. Adhesives and Sealants: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.

1.8 CLOSEOUT SUBMITTALS

- A. Warranty/Guarantee: Submit executed warranty and Subcontractor's guarantee.
- B. Specified maintenance materials.

TILING
SECTION 09 3000
3595001

- C. Maintenance Data: For tile, to include in maintenance manuals.

1.9 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials, including tile, trim shapes and grout, which match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Quantity: 3 percent of quantity installed.

1.10 QUALITY ASSURANCE

- A. Installer Qualifications: Use only thoroughly trained and experienced journeyman tile setters completely familiar with the requirements of this work and the recommendations contained in the referenced standards. No allowance will be made for lack of skill on the part of tile setters in acceptance or rejection of installed tile and related products.
- B. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.
- C. Single-Source Responsibility: Use materials and products of one manufacturer whenever possible.
 - 1. Source Limitations for Tile: Obtain tile of each type from one source or producer.
 - a. Obtain tile of each type and color or finish from same production run and of consistent quality in appearance and physical properties for each contiguous area.
 - 2. Source Limitations for Other Products: Obtain each of the following products specified in this Section from a single manufacturer for each product:
 - a. Waterproof membrane.
 - b. Crack isolation membrane.
 - c. Joint sealants.
 - d. Grout.
- D. Materials, components, assemblies, workmanship and installation are to be observed by the Project Inspector. Work not so inspected is subject to uncovering and replacement.

1.11 DELIVERY, STORAGE AND HANDLING

- A. Deliver undamaged products to job in manufacturer's sealed containers and/or original bundles with tags and labels intact.
 - 1. Comply with requirements in ANSI/TCNA A137.1 for labeling tile packages.

- B. Store materials in protected, clean, dry conditions off of ground and in areas so as to not interfere with the progress of the Work. Tile installation materials are to be stored and handled in accordance with ANSI A108.02, Section 2.0.
- C. Transport, store and handle in strict accordance with the manufacturer's written recommendations.

1.12 FIELD CONDITIONS

- A. Environmental conditions for tile installation are to be in accordance with ANSI A108.02, Section 2.2.
- B. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.
- C. Illuminate the work area during installation providing the same level and angle of illumination as will be available for final inspection.

1.13 WARRANTY

- A. Manufacturer: In addition to the Contractor's and Subcontractor's Guarantee, furnish Owner with manufacturer's fully executed written warranty against defects and workmanship for the following:
 - 1. Tile: Manufacturer's available warranty.
 - 2. Assemblies: Single source warranty by setting mortar, grout, and sealant manufacturer for a period of 25 years.
 - 3. Waterproof/crack isolation membrane sheet.
 - a. Lifetime warranty.

PART 2 - PRODUCTS

2.1 DESIGN AND PERFORMANCE CRITERIA

- A. Slip Resistance:
 - 1. For tile installed on walkway surfaces, provide products with the following values as determined by testing identical products per ANSI/TCNA A137.1, Section 9.6.
 - a. Method: Dynamic Coefficient of Friction DCOF AcuTest method, wet test using 0.05 percent sodium lauryl sulfate solution.
 - b. Application: Level interior flooring surface.
 - c. Tested Value: 0.42 or greater.
 - 2. Installed tiles will be subject to field testing to verify slip resistance as specified in Part 3.

TILING
SECTION 09 3000
3595001

- B. Expansion Joints: In accordance with EJ171 of the TCNA Handbook for Ceramic, Glass and Stone Tile Installation. Provide at expansion joints in the backing materials, cold joints in concrete substrate or where backing materials change.
 - 1. Interior Wet Locations: Provide on all surfaces maximum 12 feet on center in both axes.
 - 2. Interior Work, Not Otherwise Specified: Provide on continuous floor areas at intervals of 24 feet.
- C. Sustainable Design:
 - 1. VOC emissions for field-applied adhesives, sealants, and sealant primers must comply with limits specified in Section 01 6116.
 - 2. VOC emissions for field-applied paints and coatings must comply with limits specified in Section 01 6116.

2.2 MATERIALS, GENERAL

- A. ANSI Ceramic Tile Standard: Provide tile that complies with ANSI/TCNA A137.1 for types, compositions, and other characteristics indicated.
 - 1. Provide tile complying with Standard grade requirements unless otherwise indicated.
- B. ANSI Standards for Tile Installation Materials: Provide materials complying with ANSI A108.02, ANSI standards referenced in other Part 2 articles, ANSI standards referenced by TCNA installation methods specified in tile installation schedules, and other requirements specified.
- C. Factory Blending: For tile exhibiting color variations within ranges, blend tile in factory and package so tile units taken from one package show same range in colors as those taken from other packages and match approved Samples.
- D. Mounting: For factory-mounted tile, provide back- or edge-mounted tile assemblies as standard with manufacturer unless otherwise indicated.

2.3 MANUFACTURERS - TILE

- A. Acceptable Manufacturers: Daltile and Crossville, Inc. as specified and the basis of design, American Olean, or equal.

2.4 MATERIALS - TILE

- A. Unglazed Floor Tile: Unglazed, cushion edge, dot type, adhesive mounted in sheets; "Keystones Colorbody Porcelain Mosaics" by Daltile, or equal.
 - 1. Shape and Size: Match existing.
 - 2. Pattern: Match existing.

3. Base: 2 inches x 2 inches mounted, built-up cove base MB-5A of single color.
 4. Colors: Match existing (1 or 2 colors).
 5. Trim Units: Coordinated with sizes and coursing of adjoining flat tile where applicable and matching characteristics of adjoining flat tile. Provide shapes selected from manufacturer's standard shapes.
 6. Grout Color: As selected by Architect from manufacturer's full range.
- B. Glazed Wall Tile: Standard Grade, conforming to Section 6.1 of ANSI/TCNA A137.1; "Color Wheel-Classic, Glazed Ceramic Wall Tile" with cushion edge by Daltile, or equal.
1. Shape and Size: Match existing.
 2. Pattern: Match existing.
 3. Colors:
 - a. Field: Match existing.
 4. Trim Units: Coordinated with sizes and coursing of adjoining flat tile where applicable and matching characteristics of adjoining flat tile. Provide shapes selected from manufacturer's standard shapes.
 5. Grout Color: As selected by Architect from manufacturer's full range.

2.5 MATERIALS – CEMENTITIOUS BACKING PANELS

- A. Cementitious Backer Units (CBU): ANSI A118.9 or ASTM C1325, Type A, in maximum lengths available to minimize end-to-end butt joints; "Durock" by USG, 800-950-3839, or equal.
1. Thickness: 5/8 inch.
- B. Joint Tape: 2-inch wide alkali-resistant glass fiber mesh tape.
- C. Fasteners: Hot dipped galvanized fasteners per ASTM A153/A153M.

2.6 MANUFACTURERS – INSTALLATION MATERIALS

- A. Basis-of-Design Manufacturer: The design is based on "single source" products by MAPEI Corporation, www.mapei.com, as specified.
1. Alternate Manufacturers: Subject to compliance with requirements including "System Warranty", manufacturers offering 'single source' products that may be incorporated into the Work are:
 - a. Laticrete International, Inc., www.laticrete.com
 - b. Ardex Americas, www.ardexamericas.com
 - c. CUSTOM Building Products, www.custombuildingproducts.com.
- B. Source Limitations for Setting Materials, Waterproof/Crack Isolation Liquid Applied Membrane, Grouts and Sealant:

TILING
SECTION 09 3000
3595001

1. Obtain ingredients of uniform quality for each component from a single manufacturer.
- C. Thin-Bed Mortar (Thin-Set): Polymer fortified portland cement mortar complying with ANSI A118.4, ANSI A118.11 and ASTM C627.
1. For wall applications, provide mortar that complies with requirements for non-sagging mortar in addition to the other requirements in ANSI A118.4.
 2. Basis of Design: "Kerabond/Keralastic System" by MAPEI Corporation.
 - a. Thin-Set Mortar gauged with "Keralastic Latex Additive."
 3. Subject to compliance with requirements, provide named product or equivalent product by one of the following:
 - a. Laticrete International, Inc., "254 Platinum."
 - b. "Ardex X 77™ Microtec, Fiber Reinforced Tile and Stone Mortar."
 - c. Custom Building Products, "ProLite Premium Large Format Tile Mortar."
- D. Epoxy Mortar/Adhesive: Thin and medium-bed, chemical resistant epoxy adhesive complying with ANSI A118.3. Use for epoxy mortar applications and water-sensitive stone tile subject to staining, darkening or warping (green, blue, and rose colored marbles, resin-backed and agglomerate).
1. Basis of Design: "Kerapoxy Premium Epoxy Mortar" by MAPEI Corporation.
 2. Subject to compliance with requirements, provide named product or equivalent product by one of the following:
 - a. Laticrete International, Inc., "LATAPOXY 300 Adhesive."
 - b. "Ardex WA, Epoxy Grout and Adhesive."
 - c. Custom Building Products, "EBM-Lite Premium Epoxy Bonding Mortar – 100% Solids."

2.7 GROUT MATERIALS

- A. Polymer-Modified Cement-Based Grout Materials: Zero VOC, water-cleanable grout complying with ANSI A118.7.
1. Basis of Design: "Ultracolor Plus" by MAPEI Corporation
 2. Subject to compliance with requirements, provide named product or equivalent product by one of the following:
 - a. Laticrete International, Inc., "PERMACOLOR Grout."
 - b. "Ardex FL, Rapid Set, Flexible, Sanded Grout."
 - c. Custom Building Products, "Prism Color Consistent Grout."

2.8 CEMENTITIOUS UNDERLAYMENT AND PRIMER

- A. Cementitious Self-Leveling Underlayment: Fast-setting free-flowing cementitious underlayment complying with ASTM C627, consisting of selected

raw materials, portland cement and graded aggregates, mixed with potable water.

1. Basis of Design: "Ultraplan 1 Plus" by MAPEI Corporation.
 2. Subject to compliance with requirements, provide named product or an equivalent product by one of the following:
 - a. Laticrete International, Inc., "Laticrete NXT Level Plus."
 - b. "Ardex TL 1000, Self-Leveling Underlayment."
 - c. "Ardex Liquid BackerBoard, Self-Leveling Underlayment."
 - d. Custom Building Products, "LevelQuik Self-Leveling Underlayment."
- B. Concrete Water-Based Substrate Primer: Surface preparation for self-leveling underlayment to seal porous surfaces and improve underlayment adhesion.
1. Basis of Design: "Primer L" by MAPEI Corporation.
 2. Subject to compliance with requirements, provide named product or an equivalent product by one of the following:
 - a. Laticrete International, Inc., "Laticrete NXT Primer."
 - b. "Ardex P 51 Primer."
 - c. Custom Building Products, "LevelQuik Advance Acrylic Primer."

2.9 WATERPROOF / CRACK ISOLATION MEMBRANE – LIQUID APPLIED

- A. General: Manufacturer's standard zero VOC product complying with ANSI A118.10 and ANSI A118.12 for thin-bed, medium-bed and thick-bed bonded mortar tile applications at walls, floors and ceilings.
- B. Basis of Design: "Mapelastic AquaDefense" by MAPEI Corporation, or equal.
- C. Subject to compliance with requirements, provide named product or an equivalent product by one of the following:
 1. Laticrete International, Inc., "HYDRO BAN."
 2. "Ardex 8+9, Waterproofing and Crack Isolation Compound."
 3. Custom Building Products, "RedGuard Waterproofing and Crack Prevention Membrane."

2.10 SEALANTS

- A. General: Provide manufacturer's standard VOC compliant sealants with characteristics indicated below that comply with applicable requirements in Section 07 9200, Joint Sealants.
 1. Single-component, mildew-resistant, neutral-curing silicone sealant.
 2. Single-component, non-sag urethane sealant.
 3. Acrylic sealants not allowed.

TILING
SECTION 09 3000
3595001

- B. Basis of Design: "Mapesil AC" by MAPEI Corporation.
- C. Subject to compliance with requirements, provide named products or equivalent products by one of the following:
 - 1. Laticrete International, Inc., "LATISIL."
 - 2. "Ardex SX 100% Silicone sealant for Tile and Stone."
 - 3. Custom Building Products, "Commercial 100% Silicone Sealant."
- D. Primer: Provide manufacturer's primer for use with porous stone, submerged and permanent wet areas.
- E. Colors: Provide colors of exposed sealants to match colors of grout in tile adjoining sealed joints unless otherwise indicated.
- F. Refer also to Section 07 9200, Joint Sealants, for installation and preparation requirements.

2.11 MISCELLANEOUS MATERIALS

- A. Metal Edge Strips: L, T and bullnose shapes as shown on Drawings, height to match tile and setting-bed thickness, metallic or combination of metal and PVC or neoprene base, designed specifically for flooring applications; Schluter Systems, Plattsburg, NY, 888-472-4588, or equal.
 - 1. Profiles, materials and finish as indicated. If none are indicated, provide stainless-steel, ASTM A666, Type 302 exposed-edge material.
- B. Patching Compounds: Latex-modified, portland cement-based formulation provided or approved by manufacturer of tile-setting materials for installations indicated.
- C. Tile Protective Coating: Liquid grout-release coating that is formulated to protect exposed surfaces of stone tile and textured tile against adherence of mortar and grout.
 - 1. Compatible with mortar and grout products; easily removable after grouting is completed without damaging grout, stone tile or textured tile; and recommended for use as temporary protective coating for tile product.
 - 2. Floor sealer, complying with floor sealer specified in this Section, may be used provided it is recommended by manufacturer for use as a grout release.
- D. Tile Cleaner: A neutral cleaner capable of removing soil and residue without harming tile and grout surfaces, specifically approved for materials and installations indicated by tile and grout manufacturers.
- E. Grout Sealer (Non Epoxy Grouts): VOC compliant, manufacturer's standard silicone product for sealing grout joints and that does not change color or appearance of grout.

- F. Floor Sealer: VOC compliant, manufacturer's standard product for sealing grout joints and that does not change color or appearance of grout. Colorless, no-sheen, water-based penetrating slip and stain-resistant sealer, not affecting color or physical properties of surfaces as recommended by tile manufacturers.
 - 1. Products: Subject to compliance with requirements, products that may be incorporated into the Work are:
 - a. "Ultracare" line of products manufactured by MAPEI Corporation; www.mapei.com.
 - b. "STONETECH Heavy Duty Grout Sealer Low Solids Coating" manufactured by Laticrete International, Inc.; www.laticrete.com.
 - c. "Aqua Mix Sealer's Choice Gold" manufactured by Custom Building Products; www.custombuildingproducts.com.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas and conditions where tile will be installed, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
 - 1. Verify that substrates for setting tile are firm, dry, clean, and free of coatings that are incompatible with tile-setting materials, including curing compounds and other substances that contain soap, wax, oil, or silicone; and comply with flatness tolerances required by ANSI A108.01 for installations indicated.
 - 2. Verify that concrete substrates for tile floors comply with surface finish requirements in ANSI A108.01 for installations indicated.
 - a. Verify that surfaces that received a steel trowel finish have been mechanically scarified.
 - b. Verify that protrusions, bumps, and ridges have been removed by sanding or grinding.
 - 3. Verify that joints and cracks in tile substrates are coordinated with tile joint locations; if not coordinated, adjust joint locations in consultation with Architect.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Fill cracks, holes, and depressions in concrete substrates for tile floors installed with adhesives or thin-set mortar with trowelable leveling and patching compound specifically recommended by tile-setting material manufacturer.
 - 1. Remove protrusions, bumps, and ridges by sanding or grinding.

TILING
SECTION 09 3000
3595001

2. Correct conditions that do not comply with flatness tolerances specified in referenced ANSI A108 Series of tile installation standards.
- B. Remove coatings that are incompatible with tile-setting materials from substrates, including curing compounds and other substances that contain soap, wax, oil, or silicone.
- C. Where indicated, prepare substrates to receive waterproofing by applying a reinforced mortar bed that complies with ANSI A108.1A and is sloped 1/4 inch per foot (1:50) toward drains.
- D. Blending: For tile exhibiting color variations, verify that tile has been factory blended and packaged so tile units taken from one package show same range of colors as those taken from other packages and match approved samples. If not factory blended, either return to manufacturer or blend tiles at Project site before installing.
- E. Field-Applied Temporary Protective Coating: If indicated under tile type or needed to prevent grout from staining or adhering to exposed tile surfaces, pre-coat them with continuous film of temporary protective coating, taking care not to coat unexposed tile surfaces.

3.3 TILE BACKING PANEL INSTALLATION

- A. Install panels and treat joints according to manufacturer's written instructions for type of application indicated.

3.4 WATERPROOF / CRACK ISOLATION MEMBRANE INSTALLATION

- A. Install waterproof / crack isolation membrane to comply with ANSI A108.13, ANSI A108.17, and manufacturer's written instructions to produce membrane of uniform thickness that is bonded securely, or unbonded, to substrate.

3.5 TILE INSTALLATION

- A. Comply with the TCNA Handbook for Ceramic, Glass, and Stone Tile Installation for TCNA installation methods specified in tile installation schedules. Comply with parts of the ANSI A108 series specifications for installation of tile that are referenced in TCNA installation methods, specified in tile installation schedules, and apply to types of setting and grouting materials used.
- B. For the following installations, follow procedures in the ANSI A108 series of tile installation standards for providing 95 percent mortar coverage:
 1. Tile floors in wet areas.
- C. Wipe backs of tiles with a damp cloth to remove dirt and dust before units are installed.
- D. Pattern Orientation: Match existing.

- E. Extend tile work into recesses and under or behind equipment and fixtures to form complete covering without interruptions unless otherwise indicated. Terminate work neatly at obstructions, edges, and corners without disrupting pattern or joint alignments.
- F. Accurately form intersections and returns. Perform cutting and drilling of tile without marring visible surfaces. Carefully grind cut edges of tile abutting trim, finish, or built-in items for straight aligned joints. Fit tile closely to electrical outlets, piping, fixtures, and other penetrations so plates, collars, or covers overlap tile.
- G. Provide manufacturer's standard trim shapes where necessary to eliminate exposed tile edges.
- H. Where accent tile differs in thickness from field tile, vary setting-bed thickness so that tiles are flush.
- I. Jointing Pattern: Lay tile in grid pattern unless otherwise indicated. Lay out tile work and center tile fields in both directions in each space or on each wall area. Lay out tile work to minimize the use of pieces that are less than half of a tile. Provide uniform joint widths unless otherwise indicated.
 - 1. For tile mounted in sheets, make joints between tile sheets same width as joints within tile sheets so joints between sheets are not apparent in finished work.
 - 2. Where adjoining tiles on floor, base, walls, or trim are specified or indicated to be same size, align joints.
 - 3. Where tiles are specified or indicated to be whole integer multiples of adjoining tiles on floor, base, walls, or trim, align joints unless otherwise indicated.
- J. Joint Widths: Match existing.
- K. Lay out tile wainscots to match existing.
- L. Expansion Joints: Locate expansion joints and other sealant-filled joints, including control, contraction, and isolation joints, where indicated or according to the approved shop drawings, during installation of setting materials, mortar beds, and tile.
 - 1. Install in accordance with TCNA Method EJ171.
 - 2. Do not saw-cut joints after installing tiles.
 - 3. Where joints occur in concrete substrates, locate joints in tile surfaces directly above them.
 - 4. Prepare joints and apply sealants to comply with requirements.
- M. Grout Sealer: Apply grout sealer to cementitious grout joints according to grout-sealer manufacturer's written instructions. As soon as grout sealer has penetrated grout joints, remove excess sealer and sealer from tile faces by wiping with soft cloth.

TILING
SECTION 09 3000
3595001

- N. Floor Sealer: Apply floor sealer to cementitious grout joints in tile floors according to floor-sealer manufacturer's written instructions. As soon as floor sealer has penetrated grout joints, remove excess sealer and sealer from tile faces by wiping with soft cloth.

3.6 GROUT INSTALLATION

- A. Joints shall be packed full and free of all voids or pits, joints shall not be raked. Clean excess grout and mortar from tile surface with water as work progresses. Clean while mortar is fresh and before it hardens on the surface.
- B. Cement Based Grout: Install in accordance with ANSI A108.7 and ANSI A108.10 for cement based grout and the manufacturer's recommended procedures and precautions during application and cleaning.
- C. Epoxy Grout: Install in accordance with ANSI A108.3 and ANSI A108.6 for epoxy grout and the manufacturer's recommended procedures and precautions during application and cleaning.

3.7 INSTALLATION TOLERANCES

- A. Variation from Plumb for Wall Tile: For vertical joints, external corners, and other conspicuous lines, do not exceed 1/8 inch in 10 feet.
- B. Variation in Level for Wall Tile: For horizontal joints and other conspicuous lines, do not exceed 1/4 inch in 20 feet, or 1/2 inch maximum.
- C. Variation in Surface Plane of Floor Tile: Do not exceed 1/8 inch in 10 feet from level or slope indicated when tested with a 10 foot straightedge.
- D. Variation in Plane Between Adjacent Units (Lippage): Do not exceed the following differences between faces of adjacent units as measured from a straightedge parallel to stone tile surface:
 - 1. Units with Polished Faces: 1/64 inch.
 - 2. Units with Honed Faces: 1/32 inch.
 - 3. Units with Sand-Rubbed Faces: 1/32 inch.
 - 4. Units with Thermal-Finished Faces: Depth of thermal finish or 3/16 inch, whichever is less.
 - 5. Units with Natural-Cleft Faces: Depth of natural-cleft finish or 3/16 inch, whichever is less.
- E. Variation in Joint Width: Do not vary joint thickness more than 1/16 inch or one-fourth of nominal joint width, whichever is less.

3.8 DEFECTIVE WORK

- A. Remove and replace tile that is damaged or that does not match adjoining tile. Provide new matching units, installed as specified and in a manner to eliminate evidence of replacement.

3.9 CLEANING AND PROTECTION

- A. Cleaning: On completion of placement and grouting, clean all ceramic tile surfaces so they are free of foreign matter.
 - 1. Use recommended tile protective coating and tile cleaner, as specified.
 - 2. Remove grout residue from tile as soon as possible.
 - 3. Clean grout smears and haze from tile according to tile and grout manufacturer's written instructions but no sooner than 10 days after installation.
 - a. Use only cleaners recommended by tile and grout manufacturers and only after determining that cleaners are safe to use by testing on samples of tile and other surfaces to be cleaned.
 - 4. Protect metal surfaces and plumbing fixtures from effects of cleaning. Flush surfaces with clean water before and after cleaning.
- B. Protect installed tile work with Kraft paper or other heavy covering during construction period to prevent staining, damage, and wear. If recommended by tile manufacturer, apply coat of neutral protective cleaner to completed tile walls and floors.
- C. Prohibit foot and wheel traffic from tiled floors for at least seven days after grouting is completed.
- D. Before final inspection, remove protective coverings and rinse neutral protective cleaner from tile surfaces.

3.10 INTERIOR FLOOR TILE INSTALLATION SCHEDULE

- A. Interior Floor Installations: Standard size tile, slab-on-grade.
 - 1. Tile Installation TCNA F121: ANSI A108.1A, unbonded thick-set reinforced mortar bed (1-1/4 inch minimum to 2-inch maximum thickness) with sheet waterproof / crack isolation /cleavage membrane.
 - a. Tile: ANSI A108.1A, porcelain or ceramic, including quarry.
 - b. Grout: **[ANSI A108.10, cement based] [ANSI A108.6, epoxy]**.

<p>USE ASSEMBLY BELOW FOR ABOVE-GROUND THICK-SET MORTAR INSTALLATIONS NEEDING SOUND REDUCTION MEMBRANE</p>

- B. Interior Floor Installations: Standard size tile, above-ground concrete subfloor.
 - 1. Tile Installation TCNA F112: ANSI A108.1A, bonded thick-set unreinforced mortar bed (3/4 inch minimum to 2-inch maximum thickness) with sheet waterproof / crack isolation / sound reduction membrane.

3.11 FIELD QUALITY CONTROL

- A. Dry or Wet Slip Resistance:

TILING
SECTION 09 3000
3595001

1. Although floor tile has been selected based on manufacturer's data indicating tile meets required slip resistance, installed floor tile shall be field tested using ASTM E303 Standard Test Method for Measuring Surface Frictional Properties Using the British Pendulum Tester.
 - a. Pendulum Test Value (PTV) shall be 45 or greater under dry and wet conditions.
 - b. Individual tests shall be made for each tile flooring product installed.
 - c. Test results shall be reported in writing.
2. Alternative test method, such as use of a BOT-3000E digital tribometer, if proposed, shall provide results for both wet and dry conditions.

3.12 INTERIOR WALL TILE INSTALLATION SCHEDULE

- A. Interior Wall Installations: Standard size tile, non-wet and wet areas except showers.
 1. Tile Installation TCNA W244C: Thin-set mortar **[with liquid-applied waterproof / crack isolation membrane]** on cementitious backer units.
 - a. Wall Type: Wood.
 - b. Backer Board: ANSI A108.11, cement backer board.
 - c. Tile: ANSI A108.5, porcelain or ceramic.
 - d. Grout: **[ANSI A108.10, cement based] [ANSI A108.6, epoxy]**.

3.13 PROTECTION

- A. Protect work and materials of this Section prior to and during installation, and protect the installed work and materials of other trades.
- B. In the event of damage, make all repairs and replacements necessary to the approval of the Architect at no additional cost to the Owner.
- C. Exposed finishes shall be free from scratches, dents, permanent discolorations and other defects in workmanship or material.

END OF SECTION

*P:\Sacramento\3595 Tracy Unified School District\001-000_Villalovoz ES New Shade Structures\08 Specifications\06 SPEC\04 FINAL\Jacobson - Shade Struct\09 3000_Tiling.docx
Last Updated: March 15, 2022*

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Painting and painter's finish on all exposed exterior and interior surfaces, except prefinished items and unless otherwise noted, as required to complete finishing of the Work. The Work includes, but is not necessarily limited to, the following specific items:
 - 1. Painting work in rooms where finishing work is performed, including painting new surfaces as specified and re-painting existing surfaces within the room, unless otherwise indicated. Re-painting existing surfaces shall be with minimum of one coat using specified coatings compatible with existing.
- B. Items Not Included in This Section:
 - 1. Factory and shop-prefinished items as specified in various Sections.
 - 2. Painting specified elsewhere and included in respective Sections, including but not necessarily limited to shop priming.

1.2 WORK NOT TO BE PAINTED UNLESS OTHERWISE INDICATED

- A. Exposed exterior concrete and concrete slab surfaces, except as noted.
- B. Unfinished masonry, except where noted.
- C. Suspended acoustical ceilings and acoustical tile, except as noted.
- D. Pre-finished casework and other factory and shop-prefinished items as specified in various Sections.
- E. Finish hardware except prime coated items.
- F. Items typically not to be painted including, but not limited to, the following:
 - 1. Glass.
 - 2. Ceramic tile.
 - 3. Resilient floor covering and base.
 - 4. Carpet.
 - 5. Plastic laminate.
 - 6. Porcelain enamel.
 - 7. Vinyl wallcovering, except where noted.
- G. Aluminum doors, windows, frames and railings.
- H. Metal or plastic toilet partitions.
- I. Items of chromium, copper, nickel, brass, bronze or stainless steel.

PAINTING
SECTION 09 9100
3592001

- J. Surfaces in concealed areas such as furred spaces.
- K. Wall areas concealed by cases, counters, cabinets, chalkboards, tackboards (prime coat only required).
- L. Piping or conduit including brackets and similar items therewith running on or across unpainted or otherwise unfinished walls or ceilings.
- M. Galvanized gratings, recessed foot grilles, and thresholds.
- N. Existing rooms or areas not affected by work of this project, unless specifically noted otherwise.

1.3 RELATED REQUIREMENTS

- A. Section 01 6116, Volatile Organic Compound (VOC) Restrictions; for VOC limits pertaining to adhesives, sealants, fillers, primers, and coatings.
- B. Section 01 8113, Sustainable Design Requirements, for CAL-Green general requirements and procedures.
- C. Section 09 2900, Gypsum Board.

1.4 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CAL Green), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- C. ASTM International (ASTM):
 - 1. D523: Standard Test Method for Specular Gloss.
 - 2. D4263: Standard Test Method for Indicating Moisture in Concrete by the Plastic Sheet Method.
 - 3. D6386: Standard Practice for Preparation of Zinc (Hot-Dip Galvanized) Coated Iron and Steel Product and Hardware Surfaces for Painting.
 - 4. D7396: Standard Guide for Preparation of New, Continuous Zinc-Coated (Galvanized) Steel Surfaces for Painting.
- D. Master Painters Institute (MPI):
 - 1. Architectural Painting Manual Guide Specification.
- E. The Association for Materials Protection and Performance (AMPP):
 - 1. SSPC-Society for Protective Coatings/ National Association of Corrosion Engineers International (NACE):
 - a. SSPC-SP 1: Solvent Cleaning.
 - b. SSPC SP-10/NACE No. 2: Near-White Metal Blast Cleaning.

- c. SSPC-SP 16: Brush-Off Blast Cleaning of Coated and Uncoated Galvanized Steel, Stainless Steels, and Non-Ferrous Metals.

1.5 ADMINISTRATIVE REQUIREMENTS

- A. Submittal Procedures:
 - 1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
 - 2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
 - 3. Sustainable Design Submittals shall comply with the additional requirement of Section 01 8113, Sustainable Design Requirements.

1.6 ACTION SUBMITTALS

- A. Product Data: Submit list and complete descriptive data of products proposed for use. Include manufacturer's specifications, published warranty or guarantee, and application instructions. Cross-reference to paint system and locations of application areas.
- B. Samples:
 - 1. Appropriately label and identify each sample, including location and application. Include Architect's number as scheduled on the Drawings, manufacturer's name, color number, and gloss units.
 - 2. Prepare on 8 inch x 10 inch card stock for selected colors and finishes.
 - 3. Submit sufficiently ahead of work progress to allow for color board assembly and distribution.
 - 4. Resubmit as requested until required sheen, color, and texture are approved.

1.7 INFORMATIONAL SUBMITTALS

- A. Statement of applicator qualifications.
- B. Sustainable Design:
 - 1. General:
 - a. Submit information necessary to establish and document compliance with the California Green Building Standards Code.
 - b. Sustainable design submittals are in addition to other submittals.
 - 2. The following information shall be provided:
 - a. Paints and Coatings: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.

1.8 CLOSEOUT SUBMITTALS

- A. Guarantee: Submit Subcontractor's guarantee.

PAINTING
SECTION 09 9100
3592001

1.9 MAINTENANCE MATERIAL SUBMITTALS

- A. At completion of the Work, deliver to Owner extra stock of paint of each color used in each coating material used.
- B. Containers shall be full, tightly sealed, and clearly marked.
- C. Provide the following quantities:
 - 1. Field Colors: 1 five-gallon container.

1.10 QUALITY ASSURANCE

- A. Use only new materials and products.
- B. Single-Source Responsibility:
 - 1. To the maximum extent practicable, select a single manufacturer to provide all materials required by this Section, using additional manufacturers to provide systems not offered by the selected principal manufacturer.
 - 2. For each individual system:
 - a. Provide primer and other undercoat paint produced by same manufacturer as finish coat.
 - b. Use thinner within manufacturer's recommended limits.
- C. Source Quality Control: Material shall be best grade products of type specified and listed below as regularly manufactured by these manufacturers. Materials not bearing manufacturer's identification as standard "best grade product" of their regular line will not be considered for use.
- D. Materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.
- E. Materials and application procedures shall comply with local, state and federal air pollution control regulations.

1.11 DELIVERY, STORAGE AND HANDLING

- A. Deliver undamaged products to job in manufacturer's sealed containers and/or original bundles with tags and labels intact.
- B. Store materials in protected, clean, dry conditions off of ground and in areas which will not interfere with the progress of the Work.
- C. Transport, store and handle in strict accordance with the manufacturer's written recommendations and as specified below.
- D. Remove paint-soiled rags and waste from premises at end of each day's work or store in metal containers with metal covers.

- E. Paint stored at site, shall be in separate structure not less than 60 feet from any other building or structure. Remove empty containers and soiled rags as they accumulate. At completion, remove structure, cleanup area, and leave in original condition.

1.12 FIELD CONDITIONS

- A. Do not apply paints and coatings under conditions which jeopardize quality or appearance of painting or finishing.
- B. Cover or otherwise protect finished work of other trades and surfaces not being painted concurrently or not to be painted.
- C. Interior:
 - 1. Do not apply interior paint when air or surface temperature is below 50 degrees F unless temperature is maintained constantly.
 - 2. Do not apply when ventilation is inadequate to maintain humidity lower than dew point of coldest wall.
- D. Use moisture meter for determining proper moisture levels of surfaces for painting.
- E. Report to Architect in writing upon discovery of any prime coat painting specified in other Sections of Specifications that would prevent proper application of specified finish.
- F. Furnish, erect and remove scaffolding and planks required for work under this Section. Conform to state and local codes, rules and regulations.

1.13 EXISTING CONDITIONS

- A. Existing Surfaces:
 - 1. Paint or otherwise finish all existing surfaces as indicated or scheduled on the Drawings.
 - 2. Work includes primer, paint, repaint or finish of existing painted surfaces altered, defaced or damaged as a result of work under this Contract.
- B. Existing surfaces to be painted include:
 - 1. Work as shown on the Drawings, specified, or as required for a complete Project.

1.14 GUARANTEE

- A. Contractor: Under conditions of its Guarantee under the Contract, paint colors shall be substantially unchanged and finishes shall maintain their original adherence without showing blisters, flaking, peeling, scaling, staining or unusual deterioration or other defects.

PAINTING
SECTION 09 9100
3592001

PART 2 - PRODUCTS

2.1 DESIGN AND PERFORMANCE CRITERIA

- A. Sustainable Design:
 - 1. VOC emissions for field-applied paints and coatings must comply with limits specified in Section 01 6116.

2.2 MANUFACTURERS AND COATING PRODUCTS

- A. Products are specified under "Paint Systems" in Part 3 below and are manufactured by Sherwin-Williams, except as otherwise indicated. Equivalent products to those scheduled manufactured by PPG Architectural Finishes, Glidden Professional, Benjamin Moore & Co., Dunn-Edwards, Vista, or equal, are acceptable.
- B. Materials selected for coating systems for each type surface shall be the product of a single manufacturer or shall be acceptable to manufacturer of finish coating for system.
- C. If more than one quality level of product type is marketed, use material of highest quality.

2.3 MIXING AND TINTING

- A. Deliver paints and stains ready mixed to jobsite. On-site color mixing or tinting will not be allowed.
- B. Each kind of coating for paint finishes shall be factory-mixed to match approved samples, colors, and ready for immediate application.
- C. Mix proprietary products in strict accordance with manufacturer's printed directions.
- D. Thinning, if permitted by manufacturer for a specific coating, shall be in accordance with manufacturer's instructions. Thinning of other products shall be in accordance with standard practice.

2.4 COLORS

- A. Colors shall match existing.
- B. Colors to be selected by the Architect, or where scheduled on the Drawings, are solely for the purpose of conveying color information and do not imply manufacturer's approval or waiver of the requirement that all coatings be from the same manufacturer, unless a specific system is not available from the primary manufacturer.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Prior to the work of this Section, carefully inspect and verify that the installed work of all other trades is complete to the point where this work may properly commence.

- B. Verify that painting may be performed in accordance with the approved design.
- C. In the event of discrepancy, immediately notify Architect. Do not proceed in discrepant areas until discrepancies have been fully resolved.

3.2 PREPARATION

- A. General:
 - 1. Surface preparation and product application shall be in accordance with manufacturer's printed instructions.
 - 2. In addition to prime coats indicated (primer, sealer, filler, undercoat), use two finish coats minimum, and additional coats as required for complete coverage and good appearance of scheduled finish coat.
 - 3. Surfaces to receive new finish shall be properly prepared prior to application of finish coatings.
 - 4. Do not apply paint, enamel, stains or varnishes to wet, damp, dusty, finger-marked, rough, unfinished, or defective surfaces until such defects have been corrected.
- B. Gypsum Board:
 - 1. General:
 - a. Fill narrow, shallow cracks and small holes with spackling compound.
 - 1) Rake deep, wide cracks and deep holes.
 - 2) Dampen with clear water.
 - b. Fill with thin layers of drywall joint cement.
 - c. Allow to dry.
 - d. Sand smooth after drying. Do not raise nap of paper on gypsum board.
- C. Surfaces that cannot be prepared or painted as specified, or to level required by the coating manufacturer, shall be immediately brought to the attention of the Architect, in writing.
 - 1. Starting of work without such notification will be considered acceptance by the Contractor of surfaces involved.
 - 2. Replace unsatisfactory work caused by improper or defective surfaces, as directed by Architect.

3.3 REPAINTING EXISTING INTERIOR SURFACES

- A. Interior surfaces required to be repainted, except acoustic tile, shall be prepared as follows.
 - 1. Wash clean with solution of trisodium phosphate in water and thoroughly rinse or wash with approved self-neutralizing detergent.
 - 2. Spackle, patch, sandpaper, repair, spot or partially prime to provide "hold out" for finish coats of paint and otherwise properly prepare as necessary to provide suitable surfaces, reasonably equal to new, over which to apply specified paints.

PAINTING
SECTION 09 9100
3592001

3.4 CAULKING

- A. Caulk all cracks in finished surfaces.
- B. Seal around any wall openings where original sealant is not fully sealing.
- C. Provide sealant at material transitions and intersections as required.

3.5 PROTECTION

- A. Hardware, fixture canopies, outlet covers, switch plates and other such items shall be removed or loosened and replaced after completing work as required for painting and finishing. Protect items until reinstalled.
- B. Protect work and work of others during progress against damage. Leave such work clean and whole. Correct damage by cleaning, repairing, replacing or repainting as directed.
- C. Provide necessary drop cloths for protection of work. Cover finished surfaces adjacent to work.

3.6 APPLICATION

- A. General:
 - 1. Do not apply initial coating until moisture content of surface is within limitations recommended by paint manufacturer.
 - 2. Apply coatings in accordance with manufacturer's recommendations and the additional requirements, as applicable, of the Architectural Painting Manual Guide Specifications for application methods and paint systems.
 - 3. Flow coat on evenly and well brushed in. Should dead spots occur, touch-up before next coat is applied. Should spots or cracks burn through after final coat is applied, apply additional coats to entire surface as necessary to remedy defects.
 - 4. Rate of application shall be within limits recommended by paint manufacturer for surface involved.
- B. Thicknesses: Rate of application shall be within limits recommended by paint manufacturer for surface involved and comply with the following.
 - 1. Paint materials shall be applied in manner to average 1.5 to 3 Dry Mils in thickness for the total number of coats scheduled.
 - 2. Provide Tooke Dry Mill Coating Inspection Gauge manufactured by Micro Metrics Company to the Project Inspector for inspection of finished coating systems, if requested.
- C. Refinish whole area where portion of finish is not acceptable.
- D. Adjust natural finishes as necessary to obtain identical appearance on veneers and solid stock.

- E. Equipment adjacent to walls shall be disconnected, using workers skilled in appropriate trades, and moved to permit wall surfaces to be painted. Following completion of painting, they shall be expertly replaced and reconnected.
- F. Do not paint over fire-rating labels, fusible links, or sprinkler heads.

3.7 DEFECTIVE WORK

- A. Painter shall be responsible for damage or unsuitable work, including that caused by improperly prepared surfaces. Refinishing shall be at no cost to the Owner. Repair work damaged during construction; touch-up or refinish as necessary any abraded, stained or otherwise damaged surfaces.

3.8 CLEANING AND PROTECTION

- A. Thoroughly clean any drips, splatters, spills, splashes, etc., from walls, floor or other surfaces, with no damage to those surfaces.
- B. Protect work and materials of this Section prior to and during installation, and protect the installed work and materials of other trades.
- C. In the event of damage, make all repairs and replacements necessary to the approval of the Architect at no additional cost to the Owner.

3.9 PAINT SYSTEMS

- A. General:
 - 1. Only major areas are scheduled, but miscellaneous and similar items and areas within room or space shall be treated with suitable system.
 - 2. This Specification shall serve as guide and is meant to establish procedure and quality. Confer with the Architect to determine exact finish desired.
 - 3. Number of coats scheduled is minimum. Additional coats shall be applied at no additional cost as required to hide base material completely, produce uniform color, and provide required and satisfactory finish.
- B. Gloss and Sheen Ratings: Paint gloss shall be defined as the sheen rating of applied paint, in accordance with the following limits in conformance with Master Painters Institute, Inc. (MPI) Standards according to ASTM D523. Not all of the Gloss Levels are necessarily scheduled or used on this Project.

Gloss Level	Description	Units @ 60 degrees	Units @ 85 degrees
G1	Matte or Flat finish	0 to 5	10 max.
G2	Velvet finish	0 to 10	10 to 35
G3	Eggshell finish	10 to 25	10 to 35
G4	Satin finish	20 to 35	35 min.
G5	Semi-Gloss finish	35 to 70	
G6	Gloss finish	70 to 85	

PAINTING
SECTION 09 9100
3592001

Gloss Level	Description	Units @ 60 degrees	Units @ 85 degrees
G7	High-Gloss finish	> 85	

C. Clarification of System Terminology:

1. Interior paint Systems are specified and identified herein by initial letters "INT."
2. Exterior paint Systems are specified and identified herein by initial letters "EXT."
3. The numbers following "INT" and "EXT" for each System identifies the substrate to be coated.
4. Initial numbers for each System identify the substrate to be coated summarized as follows with further clarification included with the System description:

CODE	DESCRIPTION
3.1	Concrete
3.2	Cement Plaster
4	Masonry
5	Metal
6	Wood
9.2	Gypsum Board
9.3	Acoustical Panels and Tile

5. The letter following substrate number identifies the general finish coat chemistry summarized as follows:

CODE	DESCRIPTION
A	Standard acrylic
B	Non-bridging vinyl acrylic
C	Epoxy-like acrylic
D	Semi-transparent stain
E	Elastomeric
F	High performance epoxy-like acrylic
G	Lacquer
H	Aliphatic urethane
I	Fire Retardant Intumescent
J	Acrylic Urethane
K	PVA primer
L	Acrylic primer
M	Premium performance acrylic polymer

6. Hyphenated suffix identifies the topcoat gloss level.

3.10 INTERIOR PAINTING SYSTEMS

INT 9.2A-5

Acrylic on Gypsum Board, smooth finish - Gloss Level 5

1 coat	"ProMar 200" B28W2600	Latex Primer
2 coats	"ProMar 200" B31-2600	Latex Semi-Gloss

Note: Provide additional topcoat at toilet rooms and food service areas.

END OF SECTION

*p:\sacramento\3595 tracy unified school district\001-000_villalovoz es new shade structures\08 specifications\06 spec\04
final\jacobson - shade struct\09 9100_painting.docx
Last Updated: January 26, 2022*

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Code required signage.
 - 2. Exterior building identification and other non-code signage.

1.2 RELATED REQUIREMENTS

EDIT THE FOLLOWING CROSS REFERENCES AND ONLY INCLUDE THOSE USED ON THE PROJECT

- A. Section 01 6116, Volatile Organic Compound (VOC) Restrictions; for VOC limits pertaining to adhesives, sealants, fillers, primers, and coatings.
- B. Section 01 8113, Sustainable Design Requirements, for CAL-Green **[and Collaborative for High Performance Schools (CHPS)]** general requirements and procedures.
- C. Division 23, Mechanical.
- D. Division 26, Electrical.
- E. Signage requirements included on the Drawings.

1.3 REFERENCES AND STANDARDS

- A. California Building Code, edition as noted on the drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CAL Green), edition as noted on drawings, as adopted by the California Division of the State Architect (DSA).
- C. Title 19, CCR, Article 33.01(i).
- D. American National Standards Institute (ANSI):
 - 1. A-117.1: Accessible and Usable Buildings and Facilities.
- E. ASTM International (ASTM):
 - 1. A53/A53M: Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
 - 2. A153/A153M: Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.

SIGNAGE
SECTION 10 1400
Project Number

1.4 ADMINISTRATIVE REQUIREMENTS

A. Submittal Procedures:

1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
3. Sustainable Design Submittals shall comply with the additional requirement of Section 01 8113, Sustainable Design Requirements.

B. Coordination:

1. Prior to production of shop drawings and samples, coordinate a pre-submittal conference with Architect to confirm submittal requirements, schedule, and sign review process.
2. For signs supported by or anchored to permanent construction, advise installers of anchorage devices about specific requirements for placement of anchorage devices and similar items to be used for attaching signs. Provide template for placement of sign-anchorage devices **[and electrical service]** embedded in permanent construction by other installers.

1.5 ACTION SUBMITTALS

A. Shop Drawings:

1. Scaled drawings and signage schedule for each sign indicating materials, lettering layout, and colors.

THE FOLLOWING IS REQUIRED ONLY FOR EVACUATION MAPS, EDUCATIONAL SIGNS, DIRECTORY MAPS, AND SIMILAR SIGNAGE.

- a. Digital artwork files prepared by the Architect for the Contractor's use shall be a single layer. Manipulations of the files required for subsequent use by the Contractor, such as spreads, and traps for silkscreen negatives, building plans for Emergency Evacuation Maps, or conversion to outline or EPS, shall be the responsibility of the Contractor unless explicitly agreed otherwise by the Architect.

THE FOLLOWING SUBPARAGRAPH IS REQUIRED ONLY FOR SPECIALIZED / CUSTOM SIGNS.

2. Large-scale drawing and details of custom logo and lettering. Include mounting details.
 - a. Include plans, elevations, and large-scale sections of typical members and other components.
 - b. Show mounting methods, grounds, mounting heights, layout, spacing, reinforcement, accessories, and installation details.

SIGNAGE
SECTION 10 1400
Project Number

3. Font Style. 18 point graphical example of alphabet and numerical numbers 0 through 9 of signage font style, upper and lower case letters, punctuation, 18 point scale, and black text on white paper.
- B. Product Data: Submit list and complete descriptive data of all products proposed for use. Include manufacturer's specifications, published warranty or guarantee, installation instructions, and maintenance instructions.
- C. Samples:
 1. Submit three samples of specified signage fonts to be used for visual and tactile characters including braille below the raised characters.
 2. Color Verification: Provide physical sample of each available color from the manufacturer. Include color system name and serial number, code and name as applicable.
 3. Control Samples. Samples shall be prepared on same base material to be used in fabrication. Submit one sample of each sign type. Signage types are indicated in Construction Document details. Interior signs shall be full size.
 4. Dimensional Letters: One full-size representative samples of each dimensional letter type required, showing letter style, color, and material finish and method of attachment.
 5. Symbol of Accessibility and Pictograms. Full scale sample of pictograms and symbol of accessibility to be used on sign panels and graphics.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For installer.
- B. Sustainable Design:
 1. General:
 - a. Submit information necessary to establish and document compliance with the California Green Building Standards Code.
 - b. Sustainable design submittals are in addition to other submittals.
 2. The following information shall be provided:
 - a. Adhesives and Sealants: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.
- C. Sample of manufacturer's warranty.
- D. Signage Schedule and Alphanumeric Nomenclature. As a component of shop drawings and informational submittals, verify with Architect the sign nomenclature; room names and numbers; wording of way-finding, directional and informational signage; text; and orientation of wayfinding pictorial graphics.

1.7 CLOSEOUT SUBMITTALS

- A. Warranty/Guarantee: Submit executed warranty and Subcontractor's guarantee.

SIGNAGE
SECTION 10 1400
Project Number

- B. Maintenance data for signs and sign types including maintenance manuals.

1.8 QUALITY ASSURANCE

- A. Contractor shall assure that the vendor shall be responsible for the quality of materials and workmanship of any firm acting as the vendor's subcontractor.
- B. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.
- C. Use materials and products of one manufacturer whenever possible.
- D. Materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.
- E. The adhesion of inlaid letters and symbols will be tested. See Article WARRANTY.
- F. Mockups:

THE PRE-INSTALLATION REQUIREMENTS IN THE FIRST SUBPARAGRAPH BELOW ARE TYPICALLY NOT PROVIDED BY GC AND MAY BE OMITTED. CONFIRM WITH PROJECT MANAGER IF IT IS TO BE INCLUDED AND ENFORCED BY RGA.

- 1. Prior to installation, install pre-installation paper mockup signs for review at locations designated by Architect. The job-site review is to confirm compliance with the information included on the Drawings, typical installation conditions, and determine installation locations for non-typical conditions.
- 2. Prior to installation, provide a taping pattern for sign plaques[, and pin-mounting or stud patterns for individual letter signs components].

1.9 DELIVERY, STORAGE AND HANDLING

- A. Deliver undamaged products to job in manufacturer's sealed containers and/or original bundles with tags and labels intact.
- B. Store materials in protected, dry conditions off of ground and in areas so as to not interfere with the progress of the work.
- C. Transport, store and handle in strict accord with the manufacturer's written recommendations.

1.10 FIELD MEASUREMENTS

- A. Make and be responsible for all field dimensions necessary for proper fitting and completion of work. Report discrepancies to Architect before proceeding.

1.11 WARRANTY

- A. Manufacturer: In addition to the Contractor's and Subcontractor's Guarantee, furnish Owner with manufacturer's available fully executed written warranty for signage against

all defects in materials and workmanship, including without limitation against yellowing, cracking, crazing, and other visible and performance defects for a period of 5 years.

1. Text, pictograms or symbols that can be removed from the sign face utilizing a sharp object or other conventional methods will be considered a manufacturing defect.

PART 2 - PRODUCTS

2.1 DESIGN AND PERFORMANCE CRITERIA

A. Regulatory Standards:

1. Except as otherwise specified or shown, signage shall conform to the following:
 - a. ANSI A-117.1 and the Americans with Disabilities Act (ADA).
 - b. ATBCB Design Guidelines for Signage in relation to the Americans with Disabilities Act.
 - c. California Code of Regulations, Titles 19 and 24.
 - 1) Contracted Grade 2 Braille shall be used whenever Braille symbols are specifically required. Refer to CBC Section 11B-703.3.
 - 2) All signage shall conform to CBC Section 11B-703.
 - d. Uniform Sign Code.
2. When there is a conflict between the CBC and ADA, comply with the most stringent.

B. Design Criteria: Refer to Chapter 11B of the California Building Code.

1. Raised Characters: Section 11B-703.2.
 - a. Depth: Section 11B-703.2.1.
 - b. Case: Section 11B-703.2.2.
 - c. Style: Section 11B-703.2.3.
 - d. Character Proportions: Section 11B-703.2.4.
 - e. Character Height: Section 11B-703.2.5.
 - f. Stroke Thickness: Section 11B-703.2.6.
 - g. Character Spacing: Section 11B-703.2.7.
 - h. Line Spacing: Section 11B-703.2.8.
 - i. Installation Height and Location: Section 11B-703.4.
2. Braille: Section 11B-703.3.
 - a. Contracted (Grade 2) Braille with rounded or domed dots shall be used wherever Braille is required.
 - 1) Braille dimensions in accordance with Table 11B-703.3.1.
3. Visual Characters: Section 11B-703.5.
 - a. Character Proportions: Section 11B-703.5.4.
 - b. Stroke Thickness: Section 11B-703.5.7.

SIGNAGE
SECTION 10 1400
Project Number

- c. Character Spacing: Section 11B-703.5.8.
 - d. Line Spacing: Section 11B-703.5.9.
- 4. Pictograms: Section 11B-703.6.
 - a. Pictogram Field: 11B-703.6.1.
 - 1) Characters and Braille shall not be located in the pictogram field.
 - b. Finish and Contrast: Section 11B-703.6.2.
 - 1) Pictograms and their field shall have a non-glare finish. Pictograms shall contrast with their field with either a light pictogram on a dark field or a dark pictogram on a light field.
 - c. Text Descriptors: Section 11B-703.6.3.
 - 1) Locate text descriptors directly below the pictogram field.
 - 2) Text shall be raised characters with braille directly below.
- 5. International Symbol of Accessibility: Section 11B-703.7.2.1.
- 6. Toilet Room Door Symbols: Section 11B-703.7.2.6.
- 7. Tactile Exit Signs: Tactile exit signage to comply with 1013.4 and 11B-703.4.

C. Sustainable Design:

- 1. VOC emissions for field-applied adhesives, sealants, and sealant primers must comply with limits specified in Section 01 6116.

2.2 PLASTIC SIGNS - TACTILE

A. Materials, Unless Otherwise Noted:

- 1. Manufacturer and Product: "Inlaid Tactile Sign" by Accent Signage Systems, Inc. Minneapolis, MN, 800-215-9437 as specified and the basis of design; Ellis & Ellis Sign Systems, Sacramento, CA, 916-924-1936; ASI-Modulex, Los Altos, CA, 650-940-1354; Weidner Architectural Signage, Sacramento, CA; or equal.
 - a. Sign Face: Two 1/8-inch plies with eased edges; New Hermes "Gravo-Tac," or equal.
 - 1) Total Thickness: 1/4 inch.
 - 2) Painted signs will not be accepted.
 - b. Tactile Text: Provide tactile text and "Raster" Braille at plastic tactile signage.
 - 1) Tactile text shall be inlaid into sign face 1/32-inch and raised 1/32- inch minimum above sign face surface.
 - 2) Inlaid text shall be 1-ply, 1/16-inch thick material; "Gravo-Tac" Exterior or equal.
 - 3) Provide text and graphics precisely formed, uniformly opaque to comply with relevant ADA regulations and requirements indicated for size, style, spacing, content, position and colors.
 - 4) Symbols where specified shall be International Style.
 - 5) Braille shall be Contracted (Grade 2) Braille.

SIGNAGE
SECTION 10 1400
Project Number

- a) Dots shall be 0.10-inch on centers in each cell, 0.30-inch on center between corresponding dots in adjacent cells, and 0.395-inch minimum to 0.400-inch maximum on center between corresponding dots in cell directly below.
- b) Dots shall be raised a minimum of 0.025-inch and a maximum of 0.037-inch above the background, and a base diameter of 0.059-inch minimum and 0.063-inch maximum.
- c) Dots with straight sides and flat tops are not acceptable.

IF IT IS NOT A REQUIREMENT THAT SIGNS HAVE LIGHT LETTERS ON A DARK BACKGROUND, YOU MAY OMIT THE TEXT IN PARENTHESIS.

IF YOU HAVE ANY SIGNS THAT OCCUR ON WALLS WITH DARK ACCENT COLORS, YOU SHOULD COORDINATE THESE SIGNS TO HAVE DARK LETTERS ON A LIGHT BACKGROUND.

- c. Colors: High contrast, non-glare, integral colors for graphics.
 - 1) Integral materials shall be U.V. stabilized.
 - 2) Characters, symbols and pictograms shall be in high contrast (light color) with background (dark) color and must conform to the CBC and the ADA Standards.

B. Fabrication:

- 1. Panel Appearance: Manufacturer's standard, high contrast, semi-matte colors.
- 2. Surface Texture: Matte Non-glare.
- 3. Character Style, Size and Layout Position:
 - a. Characters shall be 1-inch high, unless otherwise indicated.
 - b. The stroke of the uppercase letter "I" shall be 15 percent maximum of the height of the character.
 - c. The width of the uppercase letter "O" shall be 60 percent minimum and 110 percent maximum of the height of the uppercase letter "I".
 - d. Character style to be Sans Serif, uppercase, accompanied by Braille directly below text at all locations where raised characters are required.
 - e. Spacing between baselines of separate lines of raised characters with a message shall be 135 percent minimum and 170 percent maximum of the raised character height.
- 4. Text Schedule: Confirm text, symbols and numbering with the Architect and Owner.
- 5. Sign Size: As indicated on the Drawings or, if not shown, as reasonably required to accommodate text, symbols and Braille.
 - a. Where signs are installed on window glazing, fabricate a blank sign back to match in size and shape to sign.
 - b. Sign backs shall cover back side of sign from view through window on opposite side of sign.

SIGNAGE
SECTION 10 1400
Project Number

- c. Signs that are mounted back-to-back on glazing are to be matching in size; the smaller sign is to be increased in size as reasonably required to match the larger sign.
- 6. Sign Shape: As indicated on the Drawings.
 - a. Corners: Radiused, unless otherwise shown.
- 7. Inlaid Letter Adhesion Process: Inlaid material shall be adhered into 1/32-inch deep routed sign face utilizing the heat and pressure bonded/chemically welded process as developed by Accent Signage Systems for the specified "Inlaid Tactile Sign."
 - a. Sign manufacturers for the specified "Inlaid Tactile Sign" shall be familiar with and utilize the exact same manufacturing process developed by Accent Signage Systems.
 - b. Manufacturer must utilize the same and required equipment, products and techniques necessary to produce authentic "Inlaid Tactile Signs" as developed by Accent Signage Systems.
 - c. Other adhesive products and methods, including applied adhesive tapes will not be accepted.

REVIEW ALL THE VARIOUS SIGN TYPES BELOW AND DETERMINE IF AND WHERE YOU NEED THE SIGN. YOU MUST IDENTIFY AND SHOW THE LOCATION OF THE SIGN IN THE DRAWINGS; OTHERWISE YOU WILL NOT GET IT. DELETE SIGNS FROM THE SPECIFICATION THAT YOU DO NOT NEED

- C. Sign Types: Provide braille translation directly below the raised characters.
 - 1. Room Identification Sign: Provide as shown on the Drawings.
 - a. Provide name and room number at each door indicated.
 - b. Names and numbers to be reviewed and approved by Architect and Owner prior to fabrication.
 - c. Allow an average of 4-numbers and 14-letters for each sign.
 - d. Sign to be provided adjacent to doors as shown.
 - 2. Toilet Room Identification Sign: In addition to the specified Door Symbol, provide a Toilet Room Identification Sign at the strike side of every toilet room door.
 - a. Sign shall include an International Symbol of Accessibility, pictogram, and raised characters, specifying the room name with Braille translation below pictogram.
 - 3. Tactile Exit Sign:
 - a. Provide with text in raised characters to read: "EXIT".
 - 4. Tactile Exit Route Sign:
 - a. Text to Read: "EXIT ROUTE."
 - 5. Tactile Floor Designation Sign:
 - a. Text to Read: "FLOOR XXX."
 - b. Include raised five pointed star preceding the text at the exit discharge level.

- c. The outside diameter of the star to be same as height of the raised characters.
- 6. Tactile Stair Sign:
 - a. Text to Read: "EXIT STAIR DOWN."

THE FOLLOWING SIGN TYPES SHALL BE DESIGNATED WITH A SHEET NOTE, PROCEEDED BY THE KEYNOTE "SIGNAGE: PLASTIC SIGN, TACTILE" IN DIVISION 10]

- 7. Tactile Area for Rescue Assistance Sign:
 - a. Text: 5/8-inch high raised characters to read "AREA OF RESCUE ASSISTANCE" with International Symbol of Accessibility.
- 8. Tactile This is Not an Exit Sign:
 - a. Text: 5/8-inch high raised characters to read "THIS IS NOT AN EXIT."

2.3 PLASTIC SIGNS - NON-TACTILE

A. Materials, Unless Otherwise Noted:

Manufacturer and Product: Acrylic panel sign as manufactured and distributed by Ellis & Ellis Sign Systems, 916-924-1936, as specified and the basis of design, or equal.

- 1. Sign Face: 1/4-inch, matt finish, non-glare acrylic with subsurface vinyl and paint. Painted faces will not be accepted.

IF IT IS NOT A REQUIREMENT THAT SIGNS HAVE LIGHT LETTERS ON A DARK BACKGROUND, YOU MAY OMIT THE TEXT IN PARENTHESIS.

IF YOU HAVE ANY SIGNS THAT OCCUR ON WALLS WITH DARK ACCENT COLORS, YOU SHOULD COORDINATE THESE SIGNS TO HAVE DARK LETTERS ON A LIGHT BACKGROUND.

- 2. Colors: Colors shall match specified Tactile Signs and as selected by Architect and Owner.
 - a. Integral materials shall be U.V. stabilized.
 - b. Graphics and text shall be in high contrast (light color) with background (dark) color.

B. Fabrication:

1-INCH HIGH CHARACTERS ARE BASED ON 5'-10" MAXIMUM TO TOP OF TEXT A.F.F, AND A MAXIMUM VIEWING DISTANCE OF 9 FEET PER CBC, TABLE 11B-703.5.5. TEXT ABOVE 5'-10" MUST BE 2" HIGH MIN., AND ABOVE 10'-0" TEXT MUST BE 3" HIGH MIN.

- 1. Sign Thickness: 1/4-inch.
- 2. Character Style, Size and Layout Position:
 - a. Characters shall be a minimum of 1-inch high, unless otherwise indicated.
 - b. The stroke thickness of the uppercase letter "I" shall be 10 percent minimum and 20 percent maximum of the height of the character.

SIGNAGE
SECTION 10 1400
Project Number

- c. The width of the uppercase letter "O" shall be 60 percent minimum and 110 percent maximum of the height of the uppercase letter "I".
 - d. Letter style to be Sans Serif, uppercase.
 - e. Space characters 10 percent minimum and 35 percent maximum of height of characters, measured between two closest points of adjacent characters, excluding word spaces.
 - f. Spacing between baselines of separate lines of characters within a message shall be 135 percent minimum and 170 percent maximum of character height.
- 3. Text Schedule: Confirm text, symbols and numbering Architect and Owner using the shop drawing/submittal process.
- 4. Sign Size: As indicated on the Drawings or, if not shown, as reasonably required to accommodate text and symbols.
 - a. Where signs are installed on window glazing, fabricate a blank sign back to match in size and shape to sign.
 - b. Sign backs will cover back side of sign from view through window on opposite side of sign.
- 5. Sign Shape: As indicated on the Drawings or, as reasonably required to accommodate the specified text and size at lettering.
 - a. Corners: 1/4-inch radius, unless otherwise shown.

REVIEW ALL THE VARIOUS SIGN TYPES BELOW AND DETERMINE IF AND WHERE YOU NEED THE SIGN. YOU MUST IDENTIFY AND SHOW THE LOCATION OF THE SIGN IN THE DRAWINGS. DELETE SIGNS FROM THE SPECIFICATION THAT YOU DO NOT NEED.

C. Sign Types:

- 1. Toilet Room Door Symbol: Provide one of the following symbols as appropriate to the toilet room type. Toilet Room Door Symbols shall have a color contrast that is distinctly different from the color of the door. Characters, as shown, to be flush with face of symbol. The entire background color must contrast with door. A thin contrasting border around the symbol, with remainder of sign background in a non-contrasting color is not allowed.
 - a. Girls: 12-inch diameter circle, with eased edges.
 - b. Boys: Equilateral triangle with sides 12-inches long, with eased edges.
 - c. Women: 12-inch diameter circle, with eased edges.
 - d. Men: Equilateral triangle with sides 12-inches long, with eased edges.
 - e. Unisex or Staff: equilateral triangle of contrasting color and super imposed on and geometrically inscribed within the face of 12-inch diameter circle, which is a contrasting color to the door. The vertices of the triangle symbol shall be located 1/4-inch maximum from the edge of the circle with the vertex pointing upward. Both the circle and triangle to have eased edges.
- 2. Occupancy Signs (Capacity Sign): Quantity of occupants shall be as indicated on the Drawings or as provided by Architect. Text to read as follows:

NUMBER OF OCCUPANTS INFORMATION IS PROVIDED IN A SHEET NOTE ON THE INTERIOR ELEVATIONS OF THE DRAWINGS ALONG WITH THE KEYNOTE WHICH DESCRIBES THE SIGN TYPE. SIGN IS SHOWN ON THE INTERIOR ELEVATIONS AND LOCATED BY DIMENSION, AT 5'-10" MAX. TO TOP OF TEXT.

- a. Maximum Number - General: "The number of people permitted in this room shall not exceed _____ by order of the Division of the State Architect."
- b. Rooms Used for Assembly and Dining: "The number of people permitted in this room shall not exceed _____ for Assembly and _____ for Dining by order of the Division of the State Architect."
- c. Rooms with Operable or Folding Partitions: "While partition is in the open position the number of people permitted in this room shall not exceed _____ by order of the Division of State Architect."
3. Disabled Accessible Entrance Signs: 6-inches high x 6-inches wide with International Symbol of Accessibility.
4. Assistive Listening System Sign: Provide as indicated on the Drawings.
5. Elevator Emergency Sign: Sign as approved by the State Fire Marshal, text with 5/8-inch high characters to read: "IN CASE OF FIRE DO NOT USE ELEVATOR. USE EXIT STAIRS."
 - a. Location: As shown or, if not shown, as approved by Architect.
6. Roof Access Sign:
 - a. Text: "ROOF ACCESS."
 - b. Provide at doors leading to a roof access ladder or stair.

THE FOLLOWING SIGN TYPES SHALL BE DESIGNATED WITH A SHEET NOTE, PRECEDED BY THE KEYNOTE "SIGNAGE: PLASTIC SIGN, NON-TACTILE" IN DIVISION 10, LOCATED AT 5'-10" AFF MAX. TO TOP OF TEXT.

7. Chemical Storage Sign:
 - a. Text: "CHEMICAL STORAGE."
8. Warning Signs:
 - a. Provide at roof access ladder to roof with science laboratory fume hood exhaust fans.
 - b. Text: 5/8-inch high characters to read "TOXIC FUMES ARE PRESENT ON ROOF. TURN OFF CIRCUIT BREAKERS TO FUME HOOD FANS BEFORE ACCESSING ROOF."
9. Gas Line Identification Sign:
 - a. Text: "CAUTION: GAS PIPE CONCEALED IN WALL."
 - b. Provide where gas lines are concealed in walls.
10. Floor Live Load Capacity Sign:
 - a. Text: "125 PSF MAXIMUM LIVE LOAD DESIGN FOR STAGE FLOOR."
 - b. Height of Letters: 1-1/2 inches.
 - c. Provide at Stage, where approved by Architect.
11. Ceiling Live Load Capacity Sign:
 - a. Text: "50 PSF MAXIMUM LIVE LOAD DESIGN FOR STAGE CEILING."

SIGNAGE
SECTION 10 1400
Project Number

- b. Height of Letters: 1-1/2 inches.
- c. Provide at Stage, where approved by Architect.

2.4 METAL SIGNS

A. Letter Style:

- 1. The stroke thickness of the uppercase letter "I" shall be 10 percent minimum and 20 percent maximum of the height of the character.
- 2. The width of the uppercase letter "O" shall be 60 percent minimum and 110 percent maximum of the height of the uppercase letter "I".
- 3. Letter style to be Sans Serif, uppercase.

B. Metal Reflectorized Signs:

- 1. Blue reflective vinyl background with white copy or symbol on 0.080 aluminum unless noted otherwise:
 - a. Disabled Accessible Parking Stall:
 - 1) International Symbol of Accessibility with text below to read "MINIMUM FINE \$250".
 - 2) Pole mounted.
 - b. Van Accessible Parking Stall:
 - 1) Same as Standard Accessible Parking Stall sign with text below to read "VAN ACCESSIBLE".
 - 2) Pole mounted.
- 2. Parking Lot Entrance: Text as shown on the Drawings, on dark blue background.
- 3. On-site Stop Sign: Red reflectorized vinyl background with white copy and border. Pole mounted; in compliance with State of California Business, Transportation and Housing Agency, Department of Transportation 1990 Uniform Sign Chart.

THE FOLLOWING SIGN TYPES SHALL BE DESIGNATED WITH A SHEET NOTE, PROCEEDED BY THE KEYNOTE "SIGNAGE: METAL REFLECTORIZED" IN DIVISION 10]

- 4. Directional Signs:
 - a. Colors: As selected by Architect and Owner.
 - b. Copy and locations as noted on Drawings.
 - c. Pole mounted.
- 5. Traffic Control Signs (On-site and Off-site): Signs shall comply with State of California Business, Transportation and Housing Agency, Department of Transportation 1990 Uniform Sign Chart, California Sign Chart and local ordinances. Colors as selected by Architect.

C. Metal Painted Signs: Baked enamel on steel.

- 1. Gate Sign: 4-inch high lettering in all caps to read: "EXIT".
 - a. Provide at exit gate(s) as shown.

- b. Colors: As selected by Architect.

2.5 BUILDING SIGNS

A. Cast Aluminum:

1. Manufacturer: Gemini Incorporated of Cannon Falls, MN, or equal.
2. Size: 8-inch tall x 1-1/2-inch **[1-7/8-inch]** stroke x 3/4-inch deep letters minimum, unless otherwise indicated.
3. Mounting: Studs as standard with manufacturer.
4. Font: Helvetica regular.
5. Finish shall be baked enamel.
 - a. Color as selected by Architect.
 - b. Text as specified herein and as indicated in the Drawings.

- B. Provide one each at each building, unless otherwise indicated. Verify exact text prior to fabrication and installation. **[As a minimum, text shall read as follows:**

CONFIRM SIGN TEXT AND LETTER SIZE WITH OWNER.

PREFERED: SHOW SIGN LOCATIONS AND TEXT ON ELEVATIONS AND OMIT THE FOLLOWING SUBPARAGRAPHS.

1. **Multi-Purpose: "Multi-Purpose".**
2. **Gym: "XXXXX XXXXXXXXXX Gymnasium".**
3. **Classrooms: "Math-Science-Technology Building".**
4. **Library: "Resource Center".**
5. **Administration: "Administration".]**
6. **[Text as shown on the Drawings.]**

2.6 MONUMENT SIGNS

FONT TYPE AND SIZES LISTED BELOW ARE STANDARD. EDIT IF A DIFFERENT SIZE LETTER AND FONT ARE DESIRED]

- A. Recessed Letter Formwork: Computer numerical control (CNC), router-cut, 2-pound density, polystyrene foam letters as manufactured by SignLettersOnline.com, 800-216-8129, or equal.
1. Size: 9-inch tall x 2-inch stroke x 1-inch deep letters, unless otherwise indicated,
 2. Font: Helvetica regular.
 3. Letters shall come with spacing pattern for proper alignment and spacing.

[OR]

- B. Cast Aluminum:

Project Number

1. Manufacturer: Gemini Incorporated of Cannon Falls, MN, or equal.
2. Size: 9-inch tall x 1-5/8-inch **[2-inch]** stroke x 3/4-inch deep letters minimum, unless otherwise indicated.
3. Mounting: Studs as standard with manufacturer.
4. Font: Helvetica regular.
5. Finish shall be baked enamel.
 - a. Color as selected by Architect.
 - b. Text as specified herein and as indicated on Drawings.

EDIT THE FOLLOWING FOR SIGN TEXT

6. Monument Sign Text: **["School Name", all caps.] [As shown on the Drawings.]**

BE SURE THAT CAST-IN-PLACE CONCRETE SIGN IS DETAILED COMPLETELY. DETAILS MUST CORRECTLY INDICATE SIGN TEXT, FONT STYLE, LETTER SIZE, LETTER STROKE WIDTH AND SPACING.

2.7 DEDICATION PLAQUE

- A. Manufacturer: A.R.K Ramos, or equal.
- B. Size and Description: 24" x 30", No. 515 border, matte dark bronze background.
- C. Font: Helvetica medium.
- D. Finish: Satin polished faces and three coats lacquer finish; A.R.K. Ramos F07, or equal.
- E. Layout:

3" high: _____ (School Name)

1" high: _____ (School District)

Board of Trustees
(to be confirmed)

Superintendent: _____ (to be confirmed)

Director of Facilities: _____ (to be confirmed)

Architect: Rainforth Grau Architects

Contractor: (to be confirmed)

3" high: (Month/Year)

- F. Final Copy: Submit final text and layout rubbing to Architect for approval.
- G. Fastenings: As recommended by the manufacturer for the mounting surface as detailed.

2.8 FLOOR-LEVEL PATHWAY MARKINGS

VERIFY WITH CBC SECTION 1013.7 AND 1013.8 FOR FLOOR-LEVEL EXIT SIGNS AND PATH MARKINGS LOCATION REQUIREMENTS. REQUIREMENTS FOR THESE TYPES OF SIGNS AND MARKINGS ARE BASED ON THE BUILDING OCCUPANCY TYPE AND FIRE SPRINKLERS.

ILLUMINATED EXIT SIGNS AND ILLUMINATED FLOOR-LEVEL EXIT SIGNS AND MARKINGS ARE SPECIFIED UNDER DIVISION 26 – ELECTRICAL. COORDINATE WITH THE ELECTRICAL ENGINEER.

IF THE PATH MARKINGS ARE NOT REQUIRED, THEN THEY SHOULD BE DELETED FROM THIS SPECIFICATION.

- A. Acceptable Manufactures: Exit Path Markings by Active Safety, Murray, Utah, 800-657-6324 as specified and the basis of design, or equal.

THE FOLLOWING INFORMATION APPEARS TO BE OUTDATED. SINCE THESE PRODUCTS ARE RARELY, IF EVER, USED ANYMORE, WE OPTED NOT TO RESEARCH CURRENT PRODUCT INFORMATION AT THIS TIME. IF REQUIRED, YOU WILL NEED TO RESEARCH WHAT IS AVAILABLE FOR YOUR PROJECT AT THE TIME.

1. Pathway Markings: Green self-illuminating photoluminescent coating on PVC panel with optional arrows and in an aluminum J-mold frame; Series 11.000 PSL, polystyrene laminate.
 - a. Size: 1 7/8" width x 52" length x 1/8" depth.
 - b. System shall be non-electrical, non-radioactive, UL 924 and ICC listed.
2. Path Marker Door Kick Plate: Die-cut, stenciled brushed aluminum faceplate with photoluminescent coating on plastic liner; Series 2002 K1800.
 - a. Plate Dimensions: 10 inches high x full width of door.
 - b. Letters: 1 inch stroke x 6 inches high.
 - c. System shall be non-electrical, non-radioactive, UL 924 and ICC listed.
 - d. Install at exit door kick plates where door is in the route of or is the designated exit to the path markings.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Prior to installation, carefully inspect and verify that the installed work of other trades is complete to the point where this installation may properly commence.
- B. Verify that specified items may be installed in accordance with the approved design.

SIGNAGE
SECTION 10 1400
Project Number

- C. In the event of discrepancy, immediately notify Architect. Do not proceed in discrepant areas until discrepancies have been fully resolved.

3.2 INSTALLATION OF SIGNS

- A. General: Locations of signs must be in accordance with the Drawings and approved shop drawings.
- B. Plastic Signs:
 - 1. General:
 - a. Provide both mechanical fasteners and either adhesive or 2-sided adhesive tape as recommended by manufacturer for given mounting substrate.
 - b. Fasteners: Minimum 4-recessed flush head tamper-proof (vandal-resistant) screws per sign.
 - 2. Wood and Metal Framed Walls: Mechanical fasteners shall be of adequate length to penetrate exterior finishes and provide secure embedment into wall structure or sheathing.

ADD NOTE TO EXTERIOR (AND INTERIOR IF APPLICABLE) ELEVATIONS AT SIGN LOCATIONS, TO REQUIRE THAT THE CONTRACTOR GRIND THE SPLIT-FACE CMU SMOOTH
--

- 3. Masonry Walls:
 - a. At split-face concrete masonry (CMU) walls, Contractor shall be responsible for providing a "bushed-down," level, rectilinear, and smooth, area, 1/2-inch larger than sign all around for flush sign mounting.
 - b. Contractor shall not grind or prep CMU wall until signs are on site and exact sign size and location are verified and approved by Architect.
 - 4. Glass:
 - a. Utilize mounting adhesive and silicone where signs are mounted to glass.
 - b. Provide vinyl window sign backer to match sign face size, mounted on opposite side of glass.
 - c. Signs mounted back-to-back are to be matching in size.
 - d. Do not pre-drill signs for mechanical fastening where sign is to be mounted to glass.
- C. Pole Mounted:
 - 1. General:
 - a. Mount signs using galvanized steel carriage bolt with hex nut and washer.
 - b. Touch up bolt head with paint to match background.
 - 2. Accessible Parking Stall Sign:
 - a. Provide one sign at each stall.
 - 3. Parking Lot Entry Sign and Stop Sign: Provide sign at location and height as indicated on the Drawings.

4. Pole: ASTM A53, Grade B, hot-dip galvanized in accordance with ASTM A153.
 - a. Diameter and Height: As shown on the Drawings.
 5. Foundations: Pole mounted signs shall be mounted in concrete footing as shown on the Drawings.
- D. Building Signs and Monument Signs:
1. Install using concealed anchors appropriate to substrate material and construction conditions.
 2. Individual letters shall be held off finishes 3/4 inch with spacers or as otherwise shown on the Drawings or approved shop drawings.
- E. Dedication Plaque:
1. Installation shall be in strict conformance with referenced standards, manufacturer's written directions, as shown in the Drawings, shop drawings, and as specified.
 2. Mounting: Concealed, in compliance with manufacturer's mounting instructions.
- F. Other Signs: Use mounting method that is permanent, vandal resistant, and has been approved by the Architect.

3.3 PROTECTION

- A. Protect work and materials of this Section and other Sections prior to and during installation, and protect the installed work and materials of all other trades.
- B. In the event of damage, immediately make all repairs and replacements necessary to the approval of the Architect and at no additional cost to the Owner.

3.4 ADJUSTING AND CLEANING

- A. Remove all dust, dirt, finger marks, etc. from signs and letters using cleaning methods as recommended by manufacturer.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Toilet accessories.
 - 2. **[Bath and shower accessories.]**
 - 3. **[Janitorial accessories.]**

1.2 RELATED REQUIREMENTS

- A. Section 05 4000, Cold-Formed Metal Framing, for blocking and backing.
- B. Section 06 1000, Rough Carpentry, for blocking and backing.
- C. Section 09 3000, Tiling.
- D. **[Section 10 2113, Plastic Toilet Compartments.]**
- E. **[Section 10 2113, Metal Toilet Compartments.]**
- F. **[Section 10 2113, Composite Toilet Compartments.]**
- G. Division 26, Electrical.

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CAL Green), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Submittal Procedures:
 - 1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
 - 2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
- B. Coordination: Coordinate with other trades as required to ensure proper and adequate provision in framing and wall finish for the installation of the selected toilet accessories in the locations required including recessed items)

TOILET ACCESSORIES
SECTION 10 2813
PROJECT NUMBER

1.5 ACTION SUBMITTALS

- A. Shop Drawings: Submit showing parts, connections and anchorages, adjacent materials, fully dimensioned and noted.
- B. Product Data: Submit list of each required accessory and complete descriptive data of products proposed for use. Include manufacturer's specifications, published warranty, installation instructions, and maintenance instructions.

1.6 INFORMATIONAL SUBMITTALS

- A. Sample of manufacturer's warranty.

1.7 CLOSEOUT SUBMITTALS

- A. Warranty/Guarantee: Submit executed warranty and Subcontractor's guarantee.
- B. Keys for lockable accessories.
- C. Maintenance data and operating instructions.

1.8 QUALITY ASSURANCE

- A. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.
- B. Use materials and products of one manufacturer whenever possible.
- C. All materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.

1.9 DELIVERY, STORAGE AND HANDLING

- A. Deliver undamaged products to job in manufacturer's sealed containers and/or original bundles with tags and labels intact.
- B. Store materials in protected, dry conditions off of ground and in areas so as to not interfere with the progress of the Work.
- C. Transport, store and handle in strict accord with the manufacturer's written recommendations.

1.10 FIELD CONDITIONS

- A. Make and be responsible for field dimensions necessary for proper fitting and completion of Work. Report discrepancies to Architect before proceeding.
- B. Verify wall depths are adequate for each item prior to ordering. Notify Architect of conflicts or discrepancies.

1.11 WARRANTY

- A. Manufacturer: In addition to the Contractor's and Subcontractor's Guarantee, furnish Owner with manufacturer's fully executed written warranty for toilet accessories against defects in materials and workmanship, agreeing to replace and install toilet accessories at no additional cost to the Owner, within warranty period as follows:
1. Hand and Hair Dryer:
 - a. Motor Brushes: For a period of 3 years.
 - b. All Other Parts: For a period of 10 years.
 2. Glass Mirrors: For a period of 10 years.
 3. All Other Accessories: For a period of 3 years.

PART 2 - PRODUCTS

2.1 OWNER FURNISHED CONTRACTOR INSTALLED PRODUCTS

- A. The following products will be furnished by the Owner for installation by Contractor. Provide adequate blocking for attachment. Miscellaneous items are to be provided and installed by Contractor.

EDIT THE FOLLOWING

1. Soap Dispensers
2. Paper Towel Dispensers.
3. Toilet Tissue Dispensers.

2.2 DESIGN AND PERFORMANCE CRITERIA

- A. Conform to applicable requirements of ADA and CBC for accessibility. When in conflict, conform to the most stringent.

2.3 MANUFACTURERS

- A. Accessories: Bobrick Washroom Equipment Inc. or Bradley Corporation as specified and the basis of design, unless otherwise noted, or equal.
1. Manufactured accessories not specified shall require approval as a substitution to be considered equal. Refer to substitution requirements specified in Section 01 3300, Submittal Procedures.
 2. Although multiple manufacturers may be specified for a specific accessory, all accessories shall be the product of a single manufacturer, unless otherwise specified or approved.

ALL ACCESSORIES SHALL BE SUBMITTED TO AND APPROVED BY THE OWNER PRIOR TO FINALIZING THIS SECTION.
--

TOILET ACCESSORIES
SECTION 10 2813
PROJECT NUMBER

2.4 MANUFACTURED UNITS

- A. General:
 - 1. Locked Dispensing Units: Key alike for all accessories.
- B. Grab Bars: 18 gauge 1-1/2 inch outside diameter, type 304 stainless steel welded to 1/8 inch type 304 solid stainless steel wall plates; Bobrick Series B-6806, Bradley 812 Series, or equal.
 - 1. Configurations and Lengths: As shown.
 - 2. Grab bar shall withstand a 250 pound point load.
 - 3. Joints ground and polished.
 - 4. Finish on Exposed Surfaces: Satin.
 - 5. Fastening: Concealed, vandal resistant.
- C. Mirror, Glass: 1/4 inch thick No. 1 (mirror glazing) quality, clear polished float glass, with protective copper backing over silver coating and non-metallic elastic paint; Bobrick Series B-165, Bradley 781 Series, or equal.
 - 1. Edges shall be protected by friction-absorbing filler strips.
 - 2. Size, Unless Otherwise Shown:
 - a. Kindergarten and Elementary Toilet Rooms: 18 inches wide x 30 inches high.
 - b. Middle School/Junior High, High School, College and Staff Toilet Rooms: 18 inches wide x 36 inches high.
 - 3. Safety Backing: Full size, shock absorbing, water-resistant, non-abrasive, 3/16 inch thick polyethylene padding.
 - 4. Backs: Galvanized steel backing with formed edges, integral horizontal hanging brackets. Provide with theft-resistant concealed hangers.
 - 5. Frames: Stainless steel, 1/2 inch x 1/2 inch x 3/8 inch channel with bright polish finish.
 - a. Use theft-resistant screws in countersunk holes where screws are exposed.
 - b. Corners: Square and mitered, weld or mechanically fastened to tight hairline joint, or frame as one piece with rounded corners.
- D. Mirror, Stainless Steel: Vandal-resistant stainless steel, frameless mirror; type 430, minimum 20 gauge stainless steel with bright polished finish, and 1/4 inch return; Bobrick Model B-942, or Bradley Model SA05.
 - 1. Mounting: Tamper-resistant screws.
- E. Recessed Toilet Paper Dispenser at Disabled Accessible Locations: Multi-roll; Bobrick B-3888.
- F. Recessed Toilet Paper Dispenser at Disabled Accessible Locations - Kindergarten/Elementary: Dual-roll, with anti-theft spindle; Bobrick B-6977, Bradley 5124-52.

TOILET ACCESSORIES
SECTION 10 2813
PROJECT NUMBER

- G. Surface Mounted Toilet Paper Dispenser: 22 gauge, type-304 stainless steel, satin finish with vandal resistant tumbler lock; Bobrick B-272, Bradley 515.

[EDIT NOTE: IF THE LOOK OF THE "CONTURA SERIES" IS OF IMPORTANCE TO YOUR PROJECT, YOU SHOULD COMPARE THE LOOK OF THE BRADELY 5A40 BEFORE INCLUDING IT IN THE SPECIFICATION.]

- H. Surface-Mounted Toilet Seat Cover Dispenser: Bobrick "Contura Series" B-4221, Bradley 5A40-11.
- I. Mop and Broom Holder: Bobrick B-239 x 34 inches long; Bradley 9933.
1. Locations: One each at each Janitor and/or Storage Room.
- J. Liquid Soap Dispenser: Provide one at each lavatory.

EDIT THE FOLLOWING IF NOT BOTH USED ON PROJECT.

1. Recessed: Bobrick B-4063.
- a. Capacity: 50 fluid ounces.
2. Surface Mounted: Bobrick B-4112.
- a. Capacity: 40 fluid ounces.
- K. Recessed Powdered Soap Dispenser: Type-304 stainless steel, satin finish; Bobrick B-341.
1. Door shall have concealed stainless steel piano hinge and tumbler lock.
2. Capacity: 50 fluid ounces.
- L. Paper Towel Dispenser: Provide recessed paper towel dispenser except where an obstruction precludes recessing, or if otherwise noted.
1. Recessed: Bobrick B-359 with 130 "Towelmate."
2. Surface Mounted: Bobrick B-262 with 130 "Towelmate."
- M. Recessed Hand **[and Hair]** Dryer: UL listed, cast-iron with vitreous enamel finish; Bobrick "AirCraft" B-750.
1. Color: White.
2. Operation: Automatic sensor; Bobrick "AutoPilot."
3. Power: 115V AC, 20 Amp, 50/60 Hz, 2300 Watts.
- N. Sanitary Napkin / Tampon Dispenser: Coin operated. Provide recessed unit except where obstruction precludes recessing.
1. Recessed: Bobrick B-3706, Bradley 407.
2. Surface Mounted: Bobrick B-2706, Bradley 407-11.

TOILET ACCESSORIES
SECTION 10 2813
PROJECT NUMBER

SPECIFY THE FOLLOWING SANITARY / TAMPON DISPENSERS WHERE COIN FREE OPERATION IS REQUIRED PURSUANT TO ASSEMBLY BILL 10.

- O. Sanitary Napkin/Tampon Dispenser: Coin free operation. Provide semi-recessed unit except where obstruction precludes recessing.
 - 1. Semi-Recessed: Bobrick B-370634C.
 - 2. Surface-Mounted: Bobrick B-2706C.
- P. Sanitary Napkin Disposal:

SPECIFY PARTITION MOUNTED DISPOSAL IN STALLS THAT ARE 32" OR LESS IN WIDTH.

- 1. Partition Mounted for Two Toilet Compartments: Bobrick B-354, Bradley 4721-15.
 - 2. Surface Mounted for Single Compartment: Bobrick B-270, Bradley 4781-11.
- Q. Shower Seat: Folding type, solid phenolic with slots, stainless steel frame, lockable in upright position until released by pulling the top of the seat away from the wall; Bobrick B-5181.
- R. Shower Rod: Extra heavy duty, length as shown on the Drawings, with shower curtain and curtain hooks; Bobrick B-6047, Bradley 9531.
- S. Curtain Hooks: Bobrick B-204-1, Bradley 9536.
- T. Vinyl Shower Curtains: Bobrick B-204-2, Bradley 9537.
- U. Hook Strip: Vandal-resistant, stainless steel; Bobrick B-985, Bradley SA41.

SELECT ONE OF THE FOLLOWING TWO SHELF PRODUCTS, UNLESS BOTH WIDTHS ARE USED

- V. **[Shelf: Surface mounted stainless steel shelf, 5 inches wide x length shown on Drawings; Bobrick B-295, Bradley 755.]**
- W. **[Shelf: Surface mounted stainless steel shelf, 6 inches wide x length shown on Drawings. Bobrick B-296, Bradley 756.]**

2.5 FASTENINGS

- A. Toilet accessories shall be complete with required fastenings.
- B. Fastenings shall either harmonize with the item being fastened, or be of the concealed type.
- C. Exposed fastenings shall be theft and vandal-resistant.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Prior to installation of the Work of this Section, carefully inspect and verify that the installed Work of other trades is complete to the point where this installation may properly commence.
- B. Verify that specified items may be installed in accordance with the approved design.
- C. In the event of discrepancy, immediately notify the Architect. Do not proceed in discrepant areas until discrepancies have been fully resolved.
- D. **[Verify that wiring for hair [hand] dryers is in place.]**

3.2 PREPARATION

- A. The Contractor shall provide recesses, anchorage and back-up blocking in sizes and in locations as required for proper installation of accessories. Coordinate with other trades where necessary to make provisions for installation.
- B. Securely anchor items in place in locations and at mounting heights indicated. Where specific dimensions are not noted, installation shall be approved by the Architect.
- C. Securely fasten grab bar mounting plates to solid framing or blocking, in accordance with CBC.
- D. Provide cut-outs in toilet partitions for napkin disposal units as required.

3.3 INSTALLATION

- A. Install fixtures, accessories and items in accordance with manufacturers' printed instructions where shown or as approved by Architect.
- B. Mount surface-mounted accessories to solid backing or blocking.
- C. Install plumb and level, securely and rigidly anchored to substrate.
- D. Use concealed vandal-resistant fastenings wherever possible.
 - 1. Adhesive installation not permitted.
 - 2. Provide anchors, bolts and other necessary fasteners, and attach accessories securely to walls or toilet partitions as recommended by manufacturer for each item and each type of substrate condition.
- E. Grab bars: Solidly anchor grab bars to withstand minimum downward pull of 500 pounds between any 2 supports after installation.
- F. Verify type, location and attachment methods of items furnished by Owner to ensure proper preparation of substrate for solid attachment of accessories.
- G. Sealants: Comply with requirements of Section 07 9200, Joint Sealants.

TOILET ACCESSORIES
SECTION 10 2813
PROJECT NUMBER

1. Apply behind toilet accessories as necessary to ensure sanitary and watertight integrity of surfaces.
2. Conceal sealants.

3.4 CLEANING AND ADJUSTING

- A. Upon completion of installation, remove manufacturer's temporary labels, marks of identification.
- B. Thoroughly wash surfaces, remove foreign materials, polish surfaces.
- C. Leave entire accessories in neat, orderly, clean, acceptable condition as approved.
- D. Replace damaged parts, surfaces which are not free from imperfections.

3.5 PROTECTION

- A. Protect Work and materials of this Section prior to and during installation, and protect the installed Work and materials of other trades.
- B. In the event of damage, make repairs and replacements necessary to the approval of the Architect at no additional cost to the Owner.
- C. Exposed finish shall be free from scratches, dents, permanent discolorations and other defects in workmanship or material.

END OF SECTION

s:\master specifications\division 10 - specialties\10 2813_toilet accessories.docx
Last Updated: April 1, 2021

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Engineered fill materials.
 - 2. Imported engineered fill material.
 - 3. Landscape backfill material'
 - 4. Decomposed granite.
 - 5. Aggregate base.

1.2 RELATED REQUIREMENTS

- A. Section 01 5000, Temporary Facilities and Controls.
- B. Section 01 8113, Sustainable Design Requirements, for CAL-Green **[and Collaborative for High Performance Schools (CHPS)]** general requirements and procedures.
- C. Section 31 2333, Trenching and Backfilling.
- D. Section 32 1200, Asphalt Concrete Paving.
- E. Section 32 1600, Site Concrete.
- F. Section 33 0000, Utilities
- G. Section 33 4000, Storm Drainage Utilities.

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CAL Green), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- C. Local Jurisdiction: Any work within the street, highway or right-of-way shall be performed in accordance with the requirement of the governmental agencies having jurisdiction, and shall not begin until all of those governing authorities have been notified.
- D. ASTM International (ASTM):
 - 1. D698-00 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures, Using 5.5 lb (2.49 Kg) Rammer and 12 inch (304.8 mm) Drop.
 - 2. D1556-00 - Test Method for Density of Soil in Place by the Sand-Cone Method.
 - 3. D1557-02e2 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 10 lb. (4.54 Kg) Rammer and 18 inch (457 mm) Drop.

**EARTHWORK
SECTION 31 0000
3595001**

4. D3017-05 Test Methods for Moisture Content of Soils and Soil-Aggregate Mixture by Nuclear Methods (Shallow Depth).
5. D422-63(2007) e1 Test Method for Particle Size Analysis of Soil.
6. D4318-05 Test Method for Liquid Limit, Plastic Limit, and Plasticity Limit.

E. CALTRANS Standard Specifications Section 17.

F. CAL-OSHA, Title 8, Section 1590 (e).

1.4 ADMINISTRATION REQUIREMENTS

A. Submittal Procedures:

1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
3. Sustainable Design Submittals shall comply with the additional requirements of Section 01 8113, Sustainable Design Requirements.

B. Site Visitation: All bidders interfacing with existing conditions shall visit the site prior to bid to verify general conditions of improvements. Discrepancies must be reported prior to the bid for clarification.

1.5 ACTION SUBMITTALS

A. Provide supplier's descriptive literature for all products to demonstrate compliance with specified attributes.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Contractor / Installer.

1.7 CLOSEOUT SUBMITTALS

A. Guarantee: Submit subcontractor's guarantee.

1.8 QUALITY ASSURANCE

- A. Contractor / Installer shall have been in business for five (5) years providing/finishing similar size projects and complexity.
- B. Contractor shall be solely responsible for all subgrades built. Failures resulting from inadequate compaction or moisture content are the responsibility of the contractor. Contractor shall be solely responsible for any and all repairs.
- C. The representatives of the Owner's testing lab will not act as supervisor of construction, nor will they direct construction operations. Neither the presence of the Owner's testing lab representatives nor the testing by the Owner's testing lab shall excuse the contractors or subcontractors for defects discovered in their work during or following completion of

the project. Correcting of inadequate compaction or moisture content is the sole responsibility of the contractor.

- D. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.
- E. All materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.
- F. Tests (See Part 3, Article "Testing and Observation" for Compaction Testing).

1.9 DELIVERY, STORAGE AND HANDLING

- A. Transport, store and handle in strict accord with the local jurisdiction.

1.10 FIELD CONDITIONS

1.11 EXISTING SITE CONDITIONS

- A. Contractor shall acquaint himself with all site conditions. If unknown active utilities are encountered during work, notify Architect promptly for instructions. Failure to notify will make Contractor liable for damage to these utilities arising from Contractor's operations subsequent to discovery of such unknown active utilities.
- B. Existing civil, mechanical and electrical improvements are shown on respective site plans to the extent known. Should the Contractor encounter any deviation between actual conditions and those shown, he is to immediately notify the Architect before continuing work.

1.12 ON SITE UTILITY VERIFICATION AND REPAIR PROCEDURES

- A. Ground-breaking requirements:
 - 1. All underground work performed by a Contractor must be authorized by the District's Construction Manager or the Low Voltage Consultant prior to start of construction.
 - 2. The Contractor is to obtain and keep the original School's construction utility site plans on site during all excavation operations. Contractor can contact the District's Construction Manager, Facilities Manager, or the Low Voltage Consultant to procure the drawings.
- B. Underground Utility Locating:
 - 1. The contractor shall hire an Underground Utility Locating Service to locate existing underground utility pathways in areas effected by the scope of work for excavation.
 - 2. Contractor must use an underground utility locator service with a minimum of 3 years experience. The equipment operator must have demonstrated experience. Contact Norcal Underground Locating (800/986-6722) or Precision Locating (800/577-7324)

EARTHWORK
SECTION 31 0000
3595001

3. The Underground Utility Locator Service must have the use of equipment with the ability to locate by means of inductive clamping, induction, inductive metal detection, conductive coupling, or TransOnde (Radiodetection) to generate signals, passive locating (free scoping) for "hot" electric, and metal detector.
4. The Underground Utility Locator Service must be able to locate existing utilities at a depth of at least 72".
5. The Underground Utility Locator Service must be able to locate but are not limited to locating the following types of utility pathways:
 - a. All conduit pathways containing 110 volt or greater 50-60Hz electrical wire.
 - b. All conduit pathways containing an active cable TV system.
 - c. All conduit pathways containing wire or conductor in which a signal can be attached and generated without damaging or triggering the existing systems.
 - d. All empty conduit pathways or pipe in which a signal probe or sonde (miniature transmitter) can be inserted.
 - e. All conduit pathways containing non-conductive cables or wires in which a signal probe or sonde (miniature transmitter) can be inserted.
 - f. All plastic and other nonconductive water lines in which a TransOnde Radiodetection) or other "transmitter" can be applied to create a low frequency pressure wave (signal) without damaging or triggering the existing systems.
 - g. All copper or steel waterlines and plastic or steel gas lines.
6. All markings made by the Underground Utility Locator Service or other shall be clear and visible.
7. The contractor shall maintain all markings made by Underground Utility Locator Service or other throughout the entire length of the project.
8. The Underground Utility Locator Service shall provide the contractor with two sets of maps showing the location of utilities and average depth. They will be referenced to permanent buildings. Contractor will deliver one copy to the district at no additional charge.
9. Contractor is responsible to contact Underground Service Alert (U.S.A. 800/227-2600) and receive clearance prior to any excavation operations.
10. Contractor shall inform the (District's Construction Manager)(Architect)(Owner) no later than five (5) days prior to the date scheduled for the utility locator service to be on site.

1.13 PROTECTION

- A. Adequate protection measures shall be provided to protect workmen and passers-by on and off the site. Adjacent property shall be fully protected throughout the operations. Blasting will not be permitted. Prevent damage to adjoining improvements and properties both above and below grade. Restore such improvements to original condition should damage occur. Replace trees and shrubs outside building area disturbed by operations.
- B. In accordance with generally accepted construction practices, the Contractor shall be solely and completely responsible for working conditions at the job site, including safety

of all persons and property during performance of the work. This requirement shall apply continuously and shall not be limited to normal working hours.

- C. Any construction review of the Contractor's performance conducted by the Geotechnical Engineer is not intended to include review of the adequacy of the Contractor's safety measures, in, on, or near the construction site.
- D. Provide shoring, sheeting, sheet piles and or bracing to prevent caving, erosion or gulying of sides of excavation.
- E. Surface Drainage: Provide for surface drainage during period of construction in manner to avoid creating nuisance to adjacent areas. The contractor shall make a reasonable effort on a daily basis to keep all excavations and the site free from water during entire progress of work, regardless of cause, source, or nature of water.
- F. Adjacent streets and sidewalks shall be kept free of mud, dirt or similar nuisances resulting from earthwork operations.
- G. The site and adjacent influenced areas shall be watered as required to suppress dust nuisance. Dust control measures shall be in accordance with the local jurisdiction.
- H. Trees: Carefully protect existing trees that are to remain. Provide temporary irrigation as necessary to maintain health of trees.

1.14 SEASONAL LIMITS

- A. No fill material shall be placed, spread or rolled during unfavorable weather conditions. When work is interrupted by rains, fill operations shall not be resumed until field tests indicate that moisture content and density of fill are satisfactory.
- B. Excessively wet fill material shall be bladed and aerated per Article "Subgrade Preparation".

1.15 TESTING

- A. General: Refer to Section 01 4523 - TESTING AND INSPECTION SERVICES, AND STRUCTURAL TESTS AND INSPECTIONS LIST, DSA-103.
- B. Geotechnical Engineer: Owner is retaining a Geotechnical Engineer to determine compliance of fill with Specifications, and to direct adjustments in fill operations. Costs of Geotechnical Engineer will be borne by Owner; except those costs incurred for re-tests or re-inspection will be paid by Owner and backcharged to Contractor.
 - 1. If Contractor elects to process or mine onsite materials for use as Suitable Fill, Aggregate Sub Base, Aggregate Base, Rock, Crushed Rock or sand the cost of all testing of this material shall be paid for by the Contractor.
 - 2. Testing of import fill for compliance with Department of Toxic Substance Control (DTSC) shall be paid for by the Contractor.

**EARTHWORK
SECTION 31 0000
3595001**

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Engineered Fill Materials: All fill shall be of approved local materials supplemented by imported fill if necessary. "Approved" local materials are defined as local soils tested and approved by Geotechnical Engineer free from debris, and concentrations of clay and organics; and contain rocks no larger than 3-inches in greatest dimension. The soil and rock should be thoroughly blended so that all rock is surrounded by soil. This may require mixing of the soil and rock with a dozer prior to placement and compaction. Clods, rocks, hard lumps or cobbles exceeding 3-inches in final size shall not be allowed in the upper 6 inches of any fill. Native clay or clayey soils will not be permitted within the upper 12 inches of building pad areas or paved areas.
- B. Imported Engineered Fill Material: Imported fill may be required to complete work. Proposed import fill material shall meet the above requirements; shall be similar to the native soils. Import fill shall meet the above requirements; shall have plasticity index of 20 or less; an Expansion Index of 15 or less; be free of particles greater than 3-inch (3") in largest dimension; be free of contaminants and have corrosion characteristics within the acceptable limits. All import fill material shall be tested and approved by Soils Engineer prior to transportation to the site. Proposed fill material shall comply with DTSC guidelines to include Phase 1 environmental site assessment and related tests. Refer to the October 2001 DTSC Information Advisory for clean imported fill material.
1. DTSC TESTING: Site work contractor is to coordinate testing with an analytical lab, hired by the owner, licensed by the State of California for the DTSC testing. The costs associated with testing will be paid by the contractor.
 2. DTSC testing shall include documentation as to the previous land use, location, and history. Soils shall be analyzed for all compounds of concern to ensure the imported soil is uncontaminated and acceptable. Testing shall be performed per the recommendations included in DTSC Imported Fill Advisory (http://www.dtsc.ca.gov/Schools/upload/SMP_FS_Cleanfill-Schools.pdf). Soils shall be tested prior to import to the project site.
 3. Lab shall determine geographically which tests and analysis comparison will be appropriate for the testing. (CAM 17 / Title 22); (RWQCB) Regional Water Quality Control Board; or (OEHHA) Office of Environmental Health Hazard Assessment.
 4. Frequency of testing shall be conducted in accordance with DTSC's Imported Fill Advisory as follows;

Fill Material Sample Schedule	
Area Of Individual Borrow Area	Sampling Requirements
2 Acres or less	Minimum of 4 samples
2 to 4 Acres	Minimum of 1 sample every ½ acre
4 to 10 Acres	Minimum of 8 samples

**EARTHWORK
SECTION 31 0000
3595001**

Greater than 10 Acres	Minimum of 8 locations with 4 subsamples per location
-----------------------	---

Volume of Borrow Area Stockpile	
Up to 1,000 Cubic Yards	1 sample per 250 cubic yards
1,000 to 5,000 Cubic Yards	4 samples for the first 1000 cubic yards + 1 sample per each additional 500 cubic yards
Greater than 5,000 Cubic Yards	12 samples for the first 5,000 cubic yards + 1 sample per each additional 1,000 cubic yards

5. Reports/ Documentation
 - a. Results of the testing analysis shall be sent to the Owner; Architect; Project Inspector, Project Civil Engineer, DTSC, and DSA. Letter shall reference DSA file and application numbers.
- C. Landscape Backfill Material:
 1. The top 3" of native topsoil stripped from the site may be used for landscape backfill material.
- D. Water: Furnish all required water for construction purposes, including compaction and dust control. Water shall be potable.
- E. Aggregate Base: Provide Class 2 3/4" Aggregate Base conforming to standard gradation as specified in Cal Trans Standard Specifications, Section 26,-1.02A.
- F. Decomposed Granite: Decomposed Granite shall be well graded mixture of fine to 1/8" particles in size with no clods. The material shall be free of vegetation, other soils, debris and rock. The material shall be redish-tan to tan in color.
- G. Decomposed Granite Solidifier: PolyPavement or equal.

PART 3 - EXECUTION

3.1 INSPECTION LAYOUT AND PREPARATION

- A. Prior to installation of the work of this Section, carefully inspect and verify by field measurements that installed work of all other trades is complete to the point were this installation may properly commence
- B. Layout all work, establish grades, locate existing underground utilities, set markers and stakes, setup and maintain barricades and protection facilities; all prior to beginning

**EARTHWORK
SECTION 31 0000
3595001**

actual earthwork operations. Layout and staking shall be done by a licensed Land Surveyor or Professional Civil Engineer.

- C. Verify that specified items may be installed in accordance with the approved design.
- D. In event of discrepancy, immediately notify Owner and the Architect. Do not proceed in discrepant areas until discrepancies have been fully resolved.

3.2 PERFORMANCE

A. GENERAL:

- 1. General: Do all grading, excavating and cutting necessary to conform finish grade and contours as shown. All cuts shall be made to true surface of subgrade.
- 2. Archaeological Artifacts: Should any artifacts of possible historic interest be encountered during earthwork operations, halt all work in area of discovery and immediately contact the Architect for notification of appropriate authorities.
- 3. Degree of Compaction: Percentage of maximum density, hereinafter specified as degree of compaction required, means density equivalent to that percentage of maximum dry density determined by ASTM D1557 Compaction Test method, and such expressed percentage thereof will be minimum acceptable compaction for specified work.
- 4. Moisture Content: Moisture content shall be as noted below and as called for on the plans. Moisture content shall be maintained until subgrade is covered by surfacing materials.

3.3 DEMOLITION, DISPOSAL AND DISPOSITION OF UNDESIRABLE MAN-MADE FEATURES

- A. All other obstructions, such as abandoned utility lines, septic tanks, concrete foundations, and the like shall be removed from site. Excavations resulting from these removal activities shall be cleaned of all loose materials, dish shaped, and widened as necessary to permit access for compaction equipment. Areas exposed by any required over-excavation should be scarified to a depth of 12", moisture-conditioned to near optimum moisture content, and recompacted to at least 95% of the maximum dry density.

3.4 TESTING AND OBSERVATION

- A. All grading and earthwork operations shall be observed by the Geotechnical Engineer or his representative, serving as the representative of the Owner.
- B. Field compaction tests shall be made by the Geotechnical Engineer or his representative. If moisture content and/or compaction are not satisfactory, Contractor will be required to change equipment or procedure or both, as required to obtain specified moisture or compaction. Notify Geotechnical Engineer at least 48 hours in advance of any filling operation.
- C. Earthwork shall not be performed without the notification or approval of the Geotechnical Engineer or his representative. The Contractor shall notify the Geotechnical Engineer at least two (2) working days prior to commencement of any aspect of the site earthwork.

- D. If the Contractor should fail to meet the compaction or design requirements embodied in this document and on the applicable plans, he shall make the necessary readjustments until all work is deemed satisfactory, as determined by the Geotechnical Engineer or Architect/Engineer.
- E. After each rain event Geotechnical Engineer shall test fill material for optimum moisture. Do not place any fill material until desired moisture is achieved.

3.5 CLEARING AND GRUBBING

- A. Prior to grading, remove all debris off-site. Remove trees and brush including the root systems. Holes resulting from tree and brush removal should be prepared and backfilled in accordance with paragraphs 3.7, 3.8, 3.9, and 3.10. This may require deepening and/or widening the holes to adequately remove disturbed soil and provide room for compaction equipment. Strip the surface of all organics. Strippings meeting the requirements of Section 32 9000 may be used in landscape areas only.

3.6 CUTTING

- A. Building pads that are located within a cut/fill transition area will have to be overexcavated to provide a semi-uniform fill beneath the building pad. The portions of building pads located in cut areas shall be overexcavated to provide no more than 1 foot difference in fill placed in the same building pad.
- B. Do all cutting necessary to bring finish grade to elevations shown on Drawings.
- C. When excavation through roots is necessary, cut roots by hand.
- D. Carefully excavate around existing utilities to avoid unnecessary damage. The contractor shall anticipate and perform hand work near existing utilities as shown on the survey, without additional claims or cost.

3.7 STRUCTURAL EXCAVATION

- A. General: Excavate to bear on firm material at contract depth shown on Structural Drawings.
- B. Footings: All footing excavations shall be of sufficient width for installation of formwork, unless earth will retain its position during concreting. All portions of footings above grade must be formed. In the event that footings are placed against earth, footing widths below grade shall be increased 2 inches from those shown on Drawings and positive protection shall be provided for top corners of trench.
- C. Unsuitable Ground: Any errors in structural excavation, soft ground, or clay soils found when excavating shall be reported to Architect. In no case shall work be built on any such soft or clayey unsuitable surface without direction from the Architect. Restore excavations to proper elevation with engineered fill material compacted to 95% of dry density.

**EARTHWORK
SECTION 31 0000
3595001**

3.8 SUBGRADE PREPARATION

- A. Grade compact and finish all subgrades within a tolerance of 0.10' of grades as indicated on Drawings and so as not to pool water. Subgrade within building pads and concrete walks shall be within 0.05' of grades indicated.
- B. After clearing, grubbing and cutting, subsurface shall be plowed or scarified to a depth of at least 12", until surface is free from ruts, hummocks or other uneven features. Moisture condition to 2% above optimum moisture content and recompact to at least 95% of the maximum dry density as determined by ASTM Test Method D1557. If the existing soils are at a water content higher than specified, the contractor shall provide multiple daily aerations by ripping, blading, and/or discing to dry the soils to a moisture content where the specified degree of compaction can be achieved. After seven consecutive working days of daily aerations, and the moisture content of the soil remains higher than specified, the contractor shall notify the architect. If the existing soils have a moisture content lower than specified, the contractor shall scarify, rip, water and blade existing soil to achieve specified moisture content. The contractor shall make proper allowance in schedule and methods to complete this work.
- C. After subgrade for fill within building pad area or within paved areas has been cleared, plowed and scarified, it shall be disked or bladed until uniform and free from large clods, brought to 2% above optimum moisture content and compacted to not less than 95% of maximum dry density, as determined by ASTM Test Method D1557, and such expressed percentage thereof will be minimum acceptable density for specified work.
- D. Subgrade in areas to receive landscaping shall be compacted to (85%).
- E. Where Contractor over-excavates building pads through error, resulting excavation shall be recompacted as engineered fill at Contractor's expense.

3.9 PLACING, SPREADING AND COMPACTING FILL MATERIAL IN BUILDING PAD AND PAVEMENT AREAS

- A. Selected fill material shall be placed in layers which, when compacted, shall not exceed 6 inches in compacted thickness. Each layer shall be spread evenly and thoroughly mixed to insure uniformity in moisture content.
- B. Selected fill material shall be moisture-conditioned to specified moisture content. Selected fill material shall be unfrozen. When moisture content of fill material is below that specified, add water until proper moisture content is achieved. When moisture content is above that specified, aerate by blading or other methods mentioned in 3.08 B until moisture content is satisfactory.
- C. After each layer has been placed, mixed and spread evenly, it shall be thoroughly compacted to a minimum of 90% as determined by the ASTM D1557 Compaction Test. Compact each layer over its entire area until desired density has been obtained.
- D. Recomposition of Fill in Trenches and Compaction of Fill Adjacent to Walls: Where trenches must be excavated, backfill with material excavated. Place in lifts that when compacted do not exceed 6", moisture conditioned to (optimum)(2% above optimum)

moisture content, and compact to a minimum of 90% relative compaction in building pad and paved areas, and to 90% relative compaction in landscape areas.

- E. Jetting of fill materials will not be allowed.

3.10 FINAL SUBGRADE COMPACTION

- A. Building Pads: Upper 12" of all final building pad subgrades (including future buildings) shall be uniformly compacted at specified moisture content to at least 90% of maximum dry density, as determined by ASTM D1557 Compaction Test, regardless of whether final subgrade elevation is attained by filling, excavation, or is left at existing grade. After acceptance of final compaction test, contractor shall maintain the required moisture content of subgrade until concrete flatwork is placed.
- B. Paved Areas: Upper 12" of all final subgrades supporting pavement sections and all other flatwork shall be brought to specified moisture content and shall be uniformly compacted to not less than 95% of maximum dry density, regardless of whether final subgrade elevation is attained by filling, excavation, or is left at existing grade. After acceptance of final compaction test, contractor shall maintain the required moisture content of subgrade until concrete flatwork is placed.
- C. Other Fill and Backfill: Upper 12" of all other final subgrades or finish grades shall be compacted to 90% of maximum dry density.
- D. Gravel Fill: Do not place compacted gravel fill until after underground work and foundations are in place. Compact gravel fill with vibratory plate or similar equipment to preclude settlement.

3.11 PLACING, SPREADING, AND COMPACTION OF LANDSCAPE BACKFILL MATERIALS

- A. All landscaped areas shall receive topsoil. After subgrade under landscape area has been scarified and brought to 85% maximum dry density, top soil shall be placed evenly to depth of 12" at 85% of maximum dry density.
- B. Project Inspector must verify that materials are uniformly spread to minimum depth specified.

3.12 SLOPE CONSTRUCTION

- A. Cut slopes shall be constructed to no steeper than 2:1(horizontal:vertical). Fill slopes shall be constructed to no steeper than 2:1 (horizontal:vertical). Prior to placement of fill on an existing slope the existing slope shall be benched. The benches shall be in a ratio of 2 horizontal to 1 vertical. The face of the fill slopes shall be compacted as the fill is placed, or the slope may be overbuilt and then cut back to the design grade. Compaction by track walking will not be allowed.

3.13 FINISH GRADING

- A. At completion of project, site shall be finished graded, as indicated on Drawings. Finish grades shall be "flat graded" to grades shown on the drawing. Mounding of finish grades

EARTHWORK
SECTION 31 0000
3595001

will not be allowed unless otherwise directed on the landscape drawings. Tolerances for finish grades in drainage swales shall be $\pm 0.05'$. Tie in new and existing finish grades. Leave all landscaped areas in finish condition for lawn seeding. Landscaped planters shall be graded uniformly from edge of planter to inlets. If sod is used for turf areas the finish grade on which it is placed shall be lowered to allow for sod thickness.

- B. All landscape areas shall be left free of rock or foreign material.
- C. All landscape areas shall be approved by Architect prior to any planting.

3.14 SURPLUS MATERIAL

- A. Excavated material not required for grading or backfill shall be removed from site at contractor's expense.

3.15 CLEANING

- A. Refer to Section 01 7700.
- B. Remove from fill all vegetation, wood, form lumber, casual lumber, and shavings, in contact with ground; buried wood will not be permitted in any fill.

END OF SECTION

s:\master specifications\division 31 - earthwork\31 0000_earthwork.docx
Received from WCEI: June 7, 2018, Updated format: 9-3-21

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Trench backfill materials.

1.2 RELATED REQUIREMENTS

- A. Section 01 5000, Temporary Facilities and Controls.
- B. Section 01 8113, Sustainable Design Requirements, for CAL-Green **[and Collaborative for High Performance Schools (CHPS)]** general requirements and procedures.
- C. Section 31 0000, Earthwork.
- D. Section 32 8000, Irrigation.
- E. Section 33 0000, Utilities
- F. Section 33 4000, Storm Drainage Utilities.

1.3 REREENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CAL Green), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- C. California Plumbing Code (CPC), edition as noted on the drawings.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Submittal Procedures:
 - 1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
 - 2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
 - 3. Sustainable Design Submittals shall comply with the additional requirements of Section 01 8113, Sustainable Design Requirements.
- B. Coordination:
 - 1. General Contractor shall coordinate work as herein specified, in accordance with drawings and as required to complete scope of work with all related trades.

TRENCHING AND BACKFILLING
SECTION 31 2333
3595001

1.5 ACTION SUBMITTALS

- A. Provide supplier's descriptive literature for all products to demonstrate compliance with specified attributes:

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For contractor / Installer.

1.7 CLOSEOUT SUBMITTALS

- A. Guarantee: Submit subcontractor's guarantee.

1.8 QUALITY ASSURANCE

- A. Contractor / Installer shall have been in business for five (5) years providing/finishing similar size projects and complexity.
- B. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.
- C. All materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.

1.9 DELIVERY, STORAGE AND HANDLING

- A. Transport, store and handle in strict accord with the local jurisdiction.

1.10 FIELD CONDITIONS

- A. Contractor shall acquaint himself with all existing site conditions. If unknown active utilities are encountered during work, notify Architect promptly for instructions. Failure to notify will make Contractor liable for damage to these utilities arising from Contractor's operations subsequent to discovery of such unknown active utilities.
- B. Trench dewatering may be necessary. Contractor shall provide any and all tools, equipment and labor necessary for trench dewatering no matter what the source. Dewatering shall be continuous until all site utilities are installed and backfilled.

1.11 PROTECTION

- A. Adequate protection measures shall be provided to protect workers and passers-by on and off the site. Adjacent property shall be fully protected throughout the operations. Blasting will not be permitted. Prevent damage to adjoining improvements and properties both above and below grade. Restore such improvements to original condition should damage occur. Replace trees and shrubs outside building area disturbed by operations. Repair all trenches in grass areas with new sod (seeding not permitted) and "stake-off" for protection.

TRENCHING AND BACKFILLING
SECTION 31 2333
3595001

- B. Contractor shall be solely and completely responsible for working conditions at the job site, including safety of all persons and property during performance of the work. This requirement shall apply continuously and shall not be limited to normal working hours.
- C. Any construction review of the Contractor's performance conducted by the Architect or Owner is not intended to include review of the adequacy of the Contractor's safety measures, in, on or near the construction site.
- D. Provide shoring, sheeting, sheet piles and or bracing to prevent caving, erosion or gulying of sides of excavation.
- E. Surface Drainage: Provide for surface drainage during period of construction in manner to avoid creating nuisance to adjacent areas. Keep all excavations free from water during entire progress of work, regardless of cause, source or nature of water.
- F. Adjacent streets and sidewalks shall be kept free of mud, dirt or similar nuisances resulting from earthwork operations.
- G. The site and adjacent influenced areas shall be watered as required to suppress dust nuisance.
- H. Trees: Carefully protect existing trees which are to remain.

1.12 TRENCH SAFETY PROVISIONS

- A. General Contractor shall be solely responsible for safety design, construction and coordination with agencies having jurisdiction. If such plan varies from shoring system standards established by Construction Safety Orders, plan shall be prepared by registered civil or structural engineer.
- B. Nothing herein shall be deemed to allow use of shoring, sloping or protective system less effective than that required by Construction Safety Orders of California State Division of Industrial Safety.
- C. When trenching through paved surface, provide steel trench plates to cover open trenches daily until trenches are backfilled.

1.13 SEASONAL LIMITS

- A. No backfill material shall be placed, spread or rolled during unfavorable weather conditions. When work is interrupted by heavy rains, full operations shall not be resumed until field tests indicate that moisture content and density of fill are satisfactory.
- B. Material above optimum moisture shall be processed per Section 31 0000, Part 3, Article "Subgrade Preparation".

1.14 TESTING

- A. General: Refer to Section 31 0000, Part 1, Article "Testing" and Part 3, Article "Testing and Observation".

TRENCHING AND BACKFILLING
SECTION 31 2333
3595001

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Backfill materials: Pipeline and conduit trench backfill as shown on the plans and as specified below.
 - 1. $\frac{3}{4}$ inch crush rock.
 - 2. Native Materials: Soil native to Project Site, free of wood, organics, and other deleterious substances. Rocks shall not be greater than 3-inches.
 - 3. Sand: Fine granular material, free of organic matter, mica, loam or clay.
 - 4. Lean Mix Concrete: 3 sacks of cement per yard plus sand.
 - 5. Class 2 aggregate base, $\frac{3}{4}$ " rock, per Caltrans Section 26-1.02B
 - 6. Controlled Density Fill: 3 sack slurry backfill.
- B. Water: Furnish all required water for construction purposes, including compaction and dust control. Water shall be potable.
- C. Provide other bedding and backfill materials as described and specified in Section 33 0000, Section 33 4000 and Divisions 22 and 26.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verification of Conditions:
 - 1. Examine areas and conditions under which work is to be performed.
 - 2. Identify conditions detrimental to proper or timely completion of work and coordinate with General Contractor to rectify.

3.2 INSTALLATION

- A. Perform work in accordance with pipe manufacturer's recommendations, as herein specified and in accordance with drawings.

3.3 TRENCHING

- A. Make all trenches open vertical construction with sufficient width to provide free working space at both sides of trench around installed item as required for caulking, joining, backfilling and compacting; not less than 12 inches wider than pipe or conduit diameter, unless otherwise noted.
- B. Carefully excavate around existing utilities to avoid unnecessary damage. The contractor shall anticipate and perform hand work near existing utilities as shown on the survey, without additional claims or cost.
- C. Trench straight and true to line and grade with bottom smooth and free of edges or rock points.

TRENCHING AND BACKFILLING
SECTION 31 2333
3595001

- D. Where depths are not shown on the plans, trench to sufficient depth to give minimum fill above top of installed item measured from finish grade above the utility as follows:
1. Sewer pipe: depth to vary
 2. Storm drain pipe: depth to vary
 3. Water pipe - Fire Supply: 36 inches
 4. Water pipe – Domestic Supply: 30 inches

3.4 BACKFILL

- A. Pipe Trench Backfill is divided into three zones:
1. Bedding: Layer of material directly under the pipe upon which the pipe is laid.
 2. Pipe Zone: Backfill from the top of the bedding to 6 inches (compacted) over the top of the pipe.
 3. Upper Zone: Backfill between top of Pipe Zone and to surface of subgrade.
- B. Bedding: Type of material and degree of compaction for bedding backfill shall be as defined in the Details and Specifications.
- C. Pipe Zone and Upper Zone Backfill:
1. Type of material and degree of compaction Pipe Zone and Upper Zone Backfill shall be as required by Drawings, Details, & Specifications.
 2. Upper Zone Backfill shall not be placed until conformance of Bedding and Pipe Zone Backfill with specified compaction test requirements has been confirmed.
 3. Backfill shall be brought up at substantially the same rate on both sides of the pipe and care shall be taken so that the pipe is not floated or displaced. Material shall not be dropped directly on pipe.
- D. Backfill Compaction:
1. Backfill shall be placed in layers which, when compacted shall not exceed 6 inches in thickness. Each layer shall be spread evenly and thoroughly mixed to insure uniformity. Do not backfill over, wet, frozen or soft subgrade surfaces. Employ a placement method that does not disturb or damage foundation walls, perimeter drainage, foundation damp-proofing, waterproofing or protective cover.
 2. When moisture content of fill material is below that required to achieve specified density, add water until proper moisture content is achieved. When moisture content is above that required, aerate by blading or other methods until specified moisture content is met; see Section 31 0000, Part 3, Article "Subgrade Preparation".
 3. After each layer has been placed, mixed and spread evenly, it shall be thoroughly compacted to 95% of maximum dry density while at specified moisture content. Compact each layer over its entire area until desired density has been obtained.
 4. Compaction: All backfill operations shall be observed by the Inspector of Record and/or Geotechnical Engineer. Field density tests shall be made to check compaction of fill material. If densities are not satisfactory, Contractor will be

TRENCHING AND BACKFILLING
SECTION 31 2333
3595001

required to change equipment or procedure or both, as required to obtain specified densities. Notify Inspector and Architect at least 24 hours in advance of any operation.

E. Backfill in Areas Previously Lime or Cement Treated

1. Where trenching occurs in areas that have been lime or cement treated, class 2 aggregate bases or approved controlled density backfill material shall be used for the top 12-inches minimum of the trench or thickness shall match the depth of treated material.

3.5 TRENCH AND SITE RESTORATION

- A. Finished surface of trenches shall be restored to a condition equal to, or better than the condition as existed prior to excavation work.

3.6 PROTECTION

- A. Protect existing surfaces, structures, and utilities from damage. Protect work by others from damage. In the event of damage, immediately repair or replace to satisfaction of Owner.
- B. Repair existing landscaped areas to as new condition. Replant trees, shrubs or groundcover with existing materials if not damaged or with new materials if required. Replace damaged lawn areas with sod, no seeding will be permitted.
- C. Replace damaged pavement with new compatible matching materials. Concrete walks to be removed to nearest expansion joint and entire panel replaced. Asphalt to be cut neatly and replaced with new materials.
- D. Any existing materials removed or damaged due to trenching to be returned to new condition.

3.7 SURPLUS MATERIAL

- A. Remove excess excavated material, unused materials, damaged or unsuitable materials from site.

3.8 CLEANING

- A. Refer to Section 01 7700.
- B. Contractor will keep the work areas in a clean and safe condition so his rubbish, waste, and debris do not interfere with the work of others throughout the project and at the completion of work.
- C. After completion of work in this section, remove all equipment, materials, and debris. Leave entire area in a neat, clean, acceptable condition.

TRENCHING AND BACKFILLING
SECTION 31 2333
3595001

END OF SECTION

s:\master specifications\division 31 - earthwork\31 2333_trenching and backfilling.docx
Received from WCEI: October 20, 2012; Updated 9-2-21

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Aggregate.
 - 2. Asphalt paving.
 - 3. Seal coat.
 - 4. Wood headers and stakes.
 - 5. Pavement marking.
 - 6. Precast concrete bumpers.

1.2 RELATED REQUIREMENTS

- A. Section 01 5000, Temporary Facilities and Controls.
- B. Section 01 6116, Volatile Organic Compound (VOC) Restrictions, for VOC limits pertaining to adhesives, sealants, fillers, primers, and coatings.
- C. Section 01 8113, Sustainable Design Requirements, for CAL-Green **[and Collaborative for High Performance Schools (CHPS)]** general requirements and procedures.
- D. Section 31 0000, Earthwork.
- E. Section 31 2333, Trenching and Backfilling.
- F. Section 32 8000, Irrigation.
- G. Section 33 0000, Utilities.
- H. Section 33 4000, Storm Drainage Utilities.

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CAL Green), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- C. Local Jurisdiction: Any work within the street, highway or right-of-way shall be performed in accordance with the requirement of the governmental agencies having jurisdiction, and shall not begin until all of those governing authorities have been notified.
- D. ASTM International (ASTM):

ASPHALT CONCRETE PAVING
SECTION 32 1200
3595001

1. D698-00 Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures, Using 5.5 lb (2.49 Kg) Rammer and 12 inch (304.8 mm) Drop.
2. D1556-00 Test Method for Density of Soil in Place by the Sand-Cone Method.
3. D1557-02 Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 10 lb. (4.54 Kg) Rammer and 18 inch (457 mm) Drop.
4. D6628-16 Standard Specification for Color of Pavement Marking Materials.
5. D3017-05 Test Methods for Moisture Content of Soils and Soil-Aggregate Mixture by Nuclear Methods (Shallow Depth).
6. D4318-05 Test Method for Liquid Limit, Plastic Limit, and Plasticity Limit.

E. CALTRANS Standard Specifications.

F. CAL-OSHA, Title 8, Section 1590 (e).

1.4 ADMINISTRATION REQUIREMENTS

A. Submittal Procedures:

1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
3. Sustainable Design Submittals shall comply with the additional requirements of Section 01 8113, Sustainable Design Requirements.

1.5 ACTION SUBMITTAS

A. Provide supplier's descriptive literature for all products to demonstrate compliance with specified attributes.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Contractor / Installer.

B. Sustainable Design:

1. General
 - a. Submit information necessary to establish and document compliance with the California Green Building Standards Code.
 - b. Sustainable design submittals are in addition to other submittals.
2. The following information shall be provided:
 - a. Adhesives and Sealants: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.
 - b. Paints and Coatings: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.

1.7 CLOSEOUT SUBMITTALS

- A. Guarantee: Submit subcontractor's guarantee.

1.8 QUALITY ASSURANCE

- A. Contractor / Installer shall have been in business for five (5) years providing/finishing similar size projects and complexity.
- B. Contractor shall be solely responsible for all subgrades built. Any repairs resulting from inadequate compaction is the responsibility of the contractor.
- C. The representatives of the Owner's testing lab will not act as supervisor of construction, nor will they direct construction operations. Neither the presence of the Owner's testing lab representatives nor the testing by the Owner's testing lab shall excuse the contractors or subcontractors for defects discovered in their work during or following completion of the project. Correcting inadequate compaction is the sole responsibility of the contractor.
- D. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.
- E. All materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.
- F. Contractor shall provide verification that asphalt mix temperature meets the requirements of this specification at time of application.
- G. Tests (See Part 1, Article "Testing").

1.9 DELIVERY, STORAGE AND HANDLING

- A. Transport, store and handle in strict accord with the local jurisdiction.

1.10 FIELD CONDITIONS

- A. Environmental Requirements:
 - 1. Base Course: Do not lay base course on muddy subgrade, during wet weather, or when atmospheric temperature is below 40 degrees F.
 - 2. Asphalt Surfacing: Do not apply asphaltic surfacing on wet base, during wet weather, or when atmospheric temperature is below 50 degrees F.

1.11 EXISTING SITE CONDITIONS

- A. Contractor shall acquaint himself with all site conditions. If unknown active utilities are encountered during work, notify Architect promptly for instructions. Failure to notify will make Contractor liable for damage to these utilities arising from Contractor's operations subsequent to discovery of such unknown active utilities.

1.12 PROTECTION

- A. Adequate protection measures shall be provided to protect workmen and passers-by on and off the site. Adjacent property shall be fully protected throughout the operations. Blasting will not be permitted. Prevent damage to adjoining improvements and properties both above and below grade. Restore such improvements to original condition should damage occur. Replace trees and shrubs outside building area disturbed by operations.
- B. In accordance with generally accepted construction practices, the Contractor shall be solely and completely responsible for working conditions at the job site, including safety of all persons and property during performance of the work. This requirement shall apply continuously and shall not be limited to normal working hours.
- C. Any construction review of the Contractor's performance conducted by the owner's representative is not intended to include review of the adequacy of the Contractor's safety measures, in, on, or near the construction site.
- D. Surface Drainage: Provide for surface drainage during period of construction in manner to avoid creating nuisance to adjacent areas. The contractor shall make a reasonable effort on a daily basis to keep all excavations and the site free from water during entire progress of work, regardless of cause, source, or nature of water.
- E. Adjacent streets and sidewalks shall be kept free of mud, dirt or similar nuisances resulting from earthwork operations.
- F. The site and adjacent influenced areas shall be watered as required to suppress dust nuisance. Dust control measures shall be in accordance with the local jurisdiction.

1.13 SEASONAL LIMITS

- A. No fill material shall be placed, spread or rolled during unfavorable weather conditions. When work is interrupted by rains, fill operations shall not be resumed until field tests indicate that moisture content and density of fill are satisfactory.

1.14 TESTING

- A. General: Refer to Section 01 4523 – TESTING & INSPECTION SERVICES AND STRUCTURAL TESTS AND INSPECTIONS LIST, DSA-103.
- B. Geotechnical Engineer: Owner is retaining a Geotechnical Engineer to determine compliance of fill with Specifications, and to direct adjustments in fill operations. Costs of Geotechnical Engineer will be borne by Owner; except those costs incurred for re-tests or re-inspection will be paid by Owner and backcharged to Contractor.

PART 2 - PRODUCTS

2.1 DESIGN AND PERFORMANCE CRITERIA

- A. Sustainable Design:

**ASPHALT CONCRETE PAVING
SECTION 32 1200
3595001**

1. VOC emissions for field-applied adhesives, sealants, and sealant primers must comply with limits specified in Section 01 6116.
2. VOC emissions for field-applied paints and coatings must comply with limits specified in Section 01 6116.

2.2 MATERIALS

- A. Sterilant: Soil sterilizer shall be CIBA GEIGY's Pramitol 25-E, Treflan EC or Thompson-Hayward Casoron.
 1. Soil sterilizer shall be applied in strict accordance with manufacturer's instructions.
- B. Base Course Aggregate: State Specifications, Section 26, Class 2 aggregate base (3/4" max.).
- C. Asphalt Binder: Steam-refined paving asphalt conforming to State Specifications, Section 92, viscosity grade PG 64-10. Asphalt binder additives for HMA per Caltrans approved list of manufacturers.
- D. Liquid Asphalt Tack Coat: Per CALTRANS section 94.
- E. Surface Course Aggregate: Mineral aggregates for Type "B" asphalt concrete, conforming to State Specifications 39-2.02, Type B, 1/2" maximum, medium gradient. 3/8" maximum gradient at Playcourt.
- F. Seal Coat: shall be a pre-mixed asphalt emulsion blended with select fillers and fibers such as:
 1. "Park-Top No. 302", Western Colloid Products.
 2. "Overcoat", Reed and Gram.
 3. "Drivewalk", Conoco Oil.
- G. Wood Headers and Stakes: Pressure treated.
- H. Pavement Marking: Colors as directed by Architect. Colors of painted traffic stripes and pavement markings must comply with ASTM D6628.
 1. Waterborne traffic line - colors white, yellow and red, State specification PTWB-01R3.
 2. Waterborne traffic line for the international symbol of accessibility and other curb markings – blue, red and green, Federal specification TT-P-1952F.
- I. Precast Concrete Bumpers: 3000 psi at 28 day minimum strength; 48" length unless otherwise indicated; provide with steel dowel anchors and concrete epoxy.
- J. Pavement Epoxy; K-Lite; KtepX-590; Ennis Epoxy HPS2 or an approved equal.
- K. Crack Filler; QPR model CAR08, 10oz asphalt crack filler; Star STA-FLEX Trowel Grade crack filler or approved equal.

ASPHALT CONCRETE PAVING
SECTION 32 1200
3595001

- L. Reclaimed Asphalt Paugment (RAP). HMA Type A or Type B may be produced using RAP providing it does not exceed 15% or the aggregate blend.

2.3 MIXES

- A. General: Plant mixed conforming to State Specifications, Section 39, Type B, 1/2" maximum, medium grading. 3/8" maximum grading shall be used at hardcourt.
- B. Temperature of Hot Mix Asphalt: Not less than 275 degrees F nor more than 325 degrees F when added to aggregate.
- C. Temperature of Hot Mix Aggregate: Not less than 250 degrees F nor more than 325 degrees F when asphalt is added.
- D. Temperature of Hot Mix Asphalt Concrete: Asphalt shall be not less than 285 degrees at time of application, nor more than 350 degrees. Asphalt not meeting the required temperature shall not be used.
- E. Temperature of Warm Mix Asphalt: Mixing and placement; per the approved manufactures heat range recommendations for mixing and placement.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Conditions of Work in Place: Subsurfaces which are to receive materials specified under this Section shall be carefully examined before beginning work hereunder, and any defects therein shall be reported, in writing, to the Architect. Work shall not be started until such defects have been corrected. Starting of work shall imply acceptance of conditions as they exist.

3.2 PREPARATION

- A. Sub-Grade: Clean, shape and compact to hard surface free from elevations or depressions exceeding 0.05' in 10' from true plan. Compact per Section 31 0000. Compaction and moisture content shall be verified immediately prior to placement of aggregate base. Proof roll subbase in presence of geotechnical engineer prior to placement of aggregate base.

3.3 INSTALLATION

- A. Headers:
 - 1. General: Install as edging to asphalt paving, except where adjoining existing pavement, concrete curbs, walks or building.
 - 2. Existing Headers: Remove existing headers where new paving will join existing. Saw cut existing asphalt to provide clean edge.
 - 3. Lines and Levels: Install true to line and grade. Cut off tops of stakes 2-inches below top of header so they will not be visible on completion of job.

**ASPHALT CONCRETE PAVING
SECTION 32 1200
3595001**

B. Asphalt Paving:

1. Base Course: Install in accord with State Specifications, Section 26. Compact to relative compaction of not less than 95%, ASTM D1557. The material shall be deposited on the subgrade in such a manner as to provide a uniform section of material within five percent tolerance of the predetermined required depth. Deposition will be by spreader box or bottom dump truck to prevent segregation of the material. The material so deposited on the subgrade shall have sufficient moisture which, in the opinion of the Architect is adequate to prevent excessive segregation. It shall then be immediately spread to its planned grade and cross section. Undue segregation of material, excessive drifting or spotting of material will not be permitted. If in the opinion of the site geotechnical engineer, the material is unsuitably segregated, it shall be removed or completely reworked to provide the desired uniformity of the material.
 - a. Moisture content and compaction of base material shall be tested immediately prior to placement of asphalt paving.
2. Sterilant: Apply specified material at manufacturer's recommended rate. Applicator of sterilant material shall be responsible for determining location of all planter areas. Apply specified material over entire base course area just prior to application of asphalt. Follow manufacturer's printed directions.
3. Liquid Asphalt Tack Coat: Apply as "tack coat" to all vertical surfaces of existing paving, curbs, walks, and construction joints in surfacing against which paving is to be placed.
4. Asphalt Concrete Surface Course:
 - a. Comply with State Specifications, 39-6 except as modified below.
 - 1) Final gradation shall be smooth, uniform and free of ruts, humps, depressions or irregularities, with a minimum density of 91% of the theoretical maximum specific gravity determined by California Test Method #309. Maximum variation 1/8 inch in 10' when measured with steel straightedge in any one direction. Test paved areas for proper drainage by applying water to cover area. Correct portions that do not drain properly by patching with plant mix. In no case shall accessible parking spaces or loading and unloading areas exceed 2% slope in any direction.
 - 2) Asphalt material shall be delivered to the project site in a covered condition to maintain acceptable temperature.
5. Placement and adjustment of Frames, Covers, Boxes and Grates: The Contractor shall set and adjust to finish grade all proposed and existing frames, covers, boxes, and grates of all manholes, drop inlets, drain boxes, valves, cleanouts, electrical boxes and other appurtenant structures prior to placement of asphaltic concrete.
6. Water Testing: All paved areas shall be water tested, to check drainage, in the presence of the project inspector prior to placement of seal coat. The surface of asphalt paving shall not vary more than 1/8 inch above or below the grade established on the plans. If variations in grade are present, they will be corrected by overlaying paving and/or pavement removal and replacement as directed by the Architect.

**ASPHALT CONCRETE PAVING
SECTION 32 1200
3595001**

7. Patching: Cut existing paving square and plumb at all edges to be joined by new paving. In trenches; grind existing asphalt on each side of trench 3" wide x 1/2 the depth of the section. Apply tack coat to vertical surfaces before installing new work. Warp carefully to flush surface, with seal over joints, and feather edge. Sawcut, remove and patch existing paving where cutting is necessary for installation of piping or conduits under Divisions 15, 16 and 33.
8. Seal Coat:
 - a. Seal coat shall be applied no sooner than 30 days from time of asphalt placement.
 - b. Surface Preparation: surface shall be clean of all dirt, sand, oil or grease. Hose down entire area with a strong jet of water to remove all debris. Remove soft, loose, or otherwise damaged areas of asphalt concrete to full depth of damage and replace with compacted asphalt concrete as specified herein. Minor holes and imperfections may be patched using hot mix asphalt or mastic using sand/SS-1-H. Use wire brush for removal of oil and grease; prime with shellac or synthetic resin as recommended by manufacturer of pavement sealer material.
 - c. Seal Coat Seal Application: Thoroughly mix materials in the presence of the onsite inspector. Failure to do so will be cause for rejection. Apply in accordance with manufacturer's written instructions.
 - a. The minimum application rate for each applied coat shall be 30gals per 1000 sq. ft. Two coats of sealcoat will be required.
 - b. Clean-Up and Precautions: As recommended by pavement sealer material manufacturer.
 - d. Clean-Up and Precautions: As recommended by pavement sealer material manufacturer.
- C. Pavement Marking: painted pavement markings shall be done only after the seal coat has thoroughly dried. On clean surfaces to be painted with traffic paint of dust, dirt, grime, oil, rust or other contaminants which will impair the quality of work or interfere with proper bond of paint coats. Surfaces shall be cleaned to the extent and by whatever means that will satisfactorily accomplish the purpose without damage to asphalt concrete. Provide measured layouts, temporary markings, templates, and other means necessary to provide required marking. Prepare and apply paint in accordance with manufacturer's instructions; paint shall be applied by spray and shall achieve complete coverage free from voids and thin spots. Where indicated on the Drawings, paint parking stall strips, lettering, arrows, accessible symbols, playground markings, game striping, maps, etc. on concrete paving or asphalt concrete paving. Paint stripes shall be 4 inches wide (except otherwise indicated) and applied with two (2) coats of herein specified Traffic Line Paint; white (except as otherwise specified or indicated).
 1. International Accessible Symbol: Symbol shall be white figures on a blue background. Blue shall be equal to color No. 15090 in Fed. Std. 595c. Lines and symbols shall be accurately formed and true to line and form; lines shall be straight and uniform in width. Painted edges shall be clean cut and free from raggedness, and corners shall be cut sharp and square. Tolerances: Apply striping within a tolerance 1/2 inch in 50 feet. Apply markings and striping to widths indicated with a tolerance of 1/4 inch on straight sections and 1/2 inch on curved sections.

ASPHALT CONCRETE PAVING
SECTION 32 1200
3595001

- D. Colors: As directed by Architect
- E. Precast Concrete Bumpers: Install where shown, using steel dowels, and epoxy applied for length to wheel stop without damage to bumpers or asphalt concrete paving.

3.4 CLEANING

- A. Upon completion of work of this Section promptly remove from the working area all scraps, debris and surplus material of this Section.
- B. Clean excess material from surface of all concrete walks and utility structures.

END OF SECTION

*s:\master specifications\division 32 - site improvements\32 1200_asphalt concrete paving.docx
Received from WCEI: December 18, 2020, Format Updated 9-8-21*

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Concrete curbs and gutters.
2. Concrete pavement, sidewalks and ramps.
3. Steel reinforcing for flatwork and curbs.
4. Truncated domes.

1.2 RELATED REQUIREMENTS

- A. Section 01 6116, Volatile Organic Compound (VOC) Restrictions; for VOC limits pertaining to adhesives, sealants, fillers, primers, and coatings.
- B. Section 01 8113, Sustainable Design Requirements, for CAL-Green **[and Collaborative for High Performance Schools (CHPS)]** general requirements and procedures.
- C. Division 31, Earthwork.
- D. Section 32 1200, Asphalt Concrete Paving.

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CALGreen), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- C. American Concrete Institute (ACI):
1. 117: Specification for Tolerances for Concrete Construction and Materials and Commentary.
 2. 211.1: Standard Practice for Selecting Proportions for Normal, Heavyweight and Mass Concrete.
 3. 301: Specifications for Structural Concrete.
 4. 302.1R: Guide to Concrete Floor and Slab Construction.
 5. 305R: Guide to Hot Weather Concreting.
 6. 306R: Guide to Cold Weather Concreting.
 7. 308R: Guide to External Curing of Concrete.
 8. 318: Building Code Requirements for Structural Concrete and Commentary.
 9. 347R: Guide to Formwork for Concrete.
- D. ASTM International (ASTM):

1. A615/A615M: Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement.
 2. A706/A706M: Standard Specification for Deformed and Plain Low-Alloy Steel Bars for Concrete Reinforcement.
 3. C33/C33M: Standard Specification for Concrete Aggregates.
 4. C94/C94M: Standard Specification for Ready-Mixed Concrete.
 5. C143/C143M: Standard Test Method for Slump of Hydraulic-Cement Concrete.
 6. C150/C150M: Standard Specification for Portland Cement.
 7. C260/C260M: Standard Specification for Air-Entraining Admixtures for Concrete.
 8. C309: Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete.
 9. C330/C330M: Standard Specification for Lightweight Aggregates for Structural Concrete.
 10. C494/C494M: Standard Specification for Chemical Admixtures for Concrete.
 11. C618: Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete.
 12. C920: Standard Specification for Elastomeric Joint Sealants.
 13. C1107/C1107M: Standard Specification for Packaged Dry, Hydraulic Cement Grout (Non-Shrink).
 14. C1315: Standard Specification for Liquid Membrane-Forming Compounds Having Special Properties for Curing and Sealing Concrete.
 15. D1751: Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types).
 16. D5893/D5893M: Standard Specification for Cold Applied, Single Component, Chemically Curing Silicone Joint Sealant for Portland Cement Concrete Pavements.
- E. Concrete Reinforcing Steel Institute (CRSI):
1. Manual of Standard Practice.
 2. Placing Reinforcing Bars.
- F. State of California, Department of Transportation (Caltrans):
1. Division of Engineering Services:
 - a. California Test 342: Method of Test for Surface Skid Resistance with the California Portable Skid Test.
 2. Standard Specifications.
 - a. Section 51, Concrete Structures.
 - b. Section 52, Reinforcement.
 - c. Section 73, Concrete Curbs and Sidewalks.
 - d. Section 90, Concrete.
- G. US Government General Services Administration (GSA/SAE):

1. GSA/SAE AMS-STD-595A: Colors Used In Government Procurement.

1.4 ADMINISTRATIVE REQUIREMENTS

A. Submittal Procedures:

1. Action Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
3. Sustainable Design Submittals shall comply with the additional requirements of Section 01 8113, Sustainable Design Requirements.

1.5 ACTION SUBMITTALS

A. Shop Drawings: Joint pattern layout for walks and pavement.

B. Product Data:

1. A complete list of materials proposed to be used for the site concrete work including, but not limited to, sand, gravel, admixtures, surface treatments, coloring agents, sealers, cast-in-place accessories, forming and curing products, concrete mix designs, reinforcing materials, joint materials, curing materials, and detectable warning surface.
2. Manufacturer's descriptive literature for products proposed for use. Include installation instructions, and maintenance instructions.

C. Concrete Mix Design: The Contractor shall submit three copies of each proposed mix design for each class of concrete in accordance with ACI 301, Sections 3.9 "Proportioning on the Basis of Previous Field Experience or Trial Mixture," or 3.10 "Proportioning Based on Empirical Data." The Contractor shall submit a separate mix design for concrete to be placed by pumping, in addition to the mix design for concrete to be placed directly from the truck chute.

1. The following information shall be included in the concrete mix design:
 - a. Proportions of cement, fine and coarse aggregate, and water.
 - b. Water-cement ratio, 28-day compressive design strength, slump, and air content.
 - c. Type of cement and aggregate.
 - d. Special requirements for pumping.
 - e. Range of ambient temperature and humidity for which design is valid.
 - f. Special characteristics of mix, which require precautions in mixing, placing, or finishing techniques to achieve specified finished product.
2. Do not begin concrete production until mixes have been reviewed and approved by Engineer.
 - a. Review of mix design by the Architect and Engineer shall in no way relieve the subcontractor of his responsibility for the performance of the concrete.

D. Qualification Data: For manufacturer

- E. Delivery tickets as specified for ready-mixed concrete.
- F. Sustainable Design:
 - 1. General:
 - a. Submit information necessary to establish and document compliance with the California Green Building Standards Code.
 - b. Sustainable design submittals are in addition to other submittals.
 - 2. The following information shall be provided:
 - a. Adhesives and Sealants: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.
 - b. Paints and Coatings: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.

1.6 CLOSEOUT SUBMITTALS

- A. Guarantee: Submit subcontractor's guarantee.

1.7 QUALITY ASSURANCE

- A. Qualifications:
 - 1. Manufacturer of ready-mixed concrete products shall meet ASTM C94/C94M requirements for production facilities and equipment.
- B. Design, erect, support, brace and maintain formwork and shoring to safely support all loads that might be applied until such loads can be carried by concrete.
- C. The Contractor shall perform work in accordance with ACI 301.
- D. Use only new materials and products.
- E. Single-Source Responsibility: Use materials and products of one manufacturer whenever possible.
- F. Materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.
- G. Testing to determine compliance with the work of this Section will be the responsibility of the Contractor.
 - 1. Cement and reinforcing shall be tested in accordance with CBC Section 1910A. Testing of reinforcing may be waived in accordance with Section 1910A.2 when approved by the Engineer and DSA.
 - 2. Testing will be performed by an independent testing and inspecting agency in accordance with Section 01 4523, Testing and Inspection Services, and paid for by the Owner.
 - 3. Refer to Article FIELD QUALITY CONTROL in Part 3 of this Section for additional requirements.

4. Cost of retests and coring due to low strength or defective concrete will be paid by the Owner and back-charged to the Contractor.
- H. Sieve analysis from testing laboratories identifying rock/sand percentages within the concrete mix; or class 2 aggregate base shall have the current Project name and Project location identified on the report. Outdated analytical reports greater than 90 days old will not be accepted.
- I. Mockups: Provide on-site mockup panels for each type of exposed colored concrete flatwork showing texture and color before proceeding with finish to be used on this Project.
 1. Construct sample panels after review and approval of samples.
 2. Size: Minimum 5 feet square and have at least one longitudinal and one transverse joint unless a more specific note indicates otherwise on Drawings.
 3. Construct sample panels at location approved by Architect.
 4. Construct sample panels in ample time to allow for finishing and curing before requesting Architect to review.
 5. Follow procedures used on accepted samples.
 6. Include saw-cut and tooled joints to match method and appearance proposed for use in completed work.
 7. Prepare successive sample panels as required until finish, color, and appearance is approved by Architect.
 8. Do not remove sample panels until authorized in writing by the Architect and all concrete work has been approved.

1.8 DELIVERY, STORAGE AND HANDLING

- A. Deliver undamaged products to job in manufacturer's sealed containers and/or original bundles with tags and labels intact.
- B. Store materials in protected, dry conditions off of ground and in areas so as to not interfere with the progress of the Work.
- C. Transport, store and handle in strict accordance with the manufacturer's written recommendations.
- D. Store cement in weather tight building, permitting easy inspection and identification. Protect from dampness. Lumpy or stale cement will be rejected.
- E. Aggregates: Prevent excessive segregation, or contamination with other materials or other sizes of aggregate. Use only one supply source for each aggregate stock pile.

1.9 FIELD CONDITIONS

- A. Make and be responsible for all field dimensions necessary for proper fitting, slopes, and completion of work. Report discrepancies to Architect before proceeding.
- B. Do not place concrete during rain without adequate protection.

- C. The Contractor shall conform to ACI 306R when mixing and placing concrete during cold weather. Provide sufficient protection when daily temperatures drop below 40 degrees F.
- D. The Contractor shall conform to ACI 305R when mixing and placing concrete during hot weather. When air temperature exceeds 100 degrees F adjust concrete mix with retarding admixture in design mix, and adequately test and take additional measures as directed by concrete supplier.
- E. The Contractor shall maintain access for vehicular and pedestrian traffic as required for other construction activities. Use temporary striping, flagmen, barricades, warning signs, and warning lights as required.
- F. Placing in hot weather: Comply with ACI 305R. Concrete shall be delivered, placed and finished in a sufficiently short period of time to avoid surface dry checking.
 - 1. Concrete shall not exceed 85 degrees F at time of placement.
 - 2. Concrete shall be kept wet continuously after tempering until implementation of curing compound procedure in accordance with this specification.
 - 3. Evaporation Retarder: Apply evaporation retarder to concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 pounds per square foot per hour, before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.
- G. Placing in Cold Weather: Comply with ACI 306R. Protect from frost or freezing. No antifreeze admixtures are permitted.
 - 1. When placing concrete during freezing or near-freezing weather, mix shall have temperature of at least 50 degrees F but not more than 90 degrees F.
 - 2. Concrete shall be maintained at temperature of at least 50 degrees F for not less than 72 hours after placing or until it has thoroughly hardened.
 - 3. Provide necessary thermal coverings for any flat work exposed to freezing temperatures.

PART 2 - PRODUCTS

2.1 DESIGN AND PERFORMANCE CRITERIA

- A. Contractor shall comply with requirements applicable to this Section for concrete materials, admixtures, bonding materials, curing materials, surface sealers and others as required.
- B. Concrete walking surfaces shall have a coefficient of friction not less than 0.30 and will be subject to testing to verify compliance as specified in Article FIELD QUALITY CONTROL.
 - 1. The coefficient of friction will be measured by California Test 342 before pavement is opened to public traffic, but not sooner than 7 days after concrete placement.

2. Contractor shall notify the Architect and Project Inspector of pavement having a coefficient of friction less than 0.30.
- C. Sustainable Design:
1. VOC emissions for field-applied adhesives, sealants, and sealant primers must comply with limits specified in Section 01 6116.
 2. VOC emissions for field-applied paints and coatings must comply with limits specified in Section 01 6116.

2.2 FORMING MATERIALS

- A. Form Material: Steel, wood, or other suitable material of size and strength to resist movement during concrete placement and to retain horizontal and vertical alignment until removal. Use straight forms, free of distortion and defects. Use flexible spring steel forms or laminated boards to form radius bends as required. The forms shall be of a depth equal to the depth of curbing or sidewalk, and so designed as to permit secure fastening together at the tops. Coat forms with non-staining type coating that will not discolor or deface surface of concrete.
1. Concrete Exposed to View: 5/8-inch minimum APA B-B Plyform, steel or "Sonotube" forms by Sunoco, 888-875-8754, or equal.
 2. Concrete Concealed from View: 5/8-inch minimum APA B-B Plyform, steel or 1 x 8 DF, Number 2 Grade or better.
- B. Form Ties: Snap off metal of fixed length, leaving no metal within 1-1/2 inches of surface and no fractures, spalls or other surface defects larger than 1 inch diameter; manufactured by Burke, Dayton Superior, or equal.
- C. Spreaders: Metal. Wood is not permitted.
- D. Form Coating: Coat forms with non-staining material that will not discolor or deface surface of concrete or leave any residue on concrete that would interfere with surface coating as approved by the Architect.
- E. Chamfer Strips: Rigid polyvinyl chloride, 3/4-inch x 3/4-inch, in maximum possible lengths, manufactured by Burke, Greenstreak, Vulco, or equal.

2.3 REINFORCING MATERIALS

- A. Reinforcement Bars: New billet steel deformed bars conforming to requirements of ASTM A615/A615M or ASTM A706/A706M; Grade 60.
1. Bars for dowels installed through expansion joints or construction joints to existing sidewalks or concrete features shall be smooth or if deformed shall be sleeved on one end for slippage.
- B. Reinforcing Supports: Galvanized metal chairs or spacers or metal hangers, accurately placed 3 feet on center each way, staggered, with each support securely fastened to steel reinforcement in place.

1. Bottom bars in footings may be supported with 3-inch concrete blocks with embedded wire ties.
2. Concrete supports without wire ties will not be allowed.

2.4 CONCRETE MATERIALS

- A. Cement: Portland cement in accordance with ASTM C150/C150M, Type II, low alkali.
- B. Concrete Aggregates: Graded from coarse to fine in accordance with ASTM C33/C33M.
 1. Normal Weight Aggregates: Clean and free from deleterious coatings, clay balls, roots, and other extraneous materials, and in conformance with ASTM C33/C33M, except as otherwise specified. Combined grading shall meet limits of ASTM C33/C33M.
 - a. Size: Not be larger than one-fifth of the narrowest dimension between forms, or larger than three-fourths of the minimum clear spacing between reinforcing bars.
 2. Lightweight Aggregates:
 - a. General: Durable particles suitably processed, washed and screened without adherent coatings, free of materials with deleterious reactivity to alkali in cement, and conforming to ASTM C330/C330M.
 - b. Fine aggregate shall be natural sand, or sand prepared from stone or gravel, with grains free of silt, loam and clay.
- C. Water: Potable, clean, and in accordance with ASTM C94/C94M, free from injurious amounts of oil, acids, alkalis, salts, scale, organic materials or other deleterious matter, and in compliance with ACI 318 Section 26.4.1.3.
- D. Fly Ash: Western Fly Ash, conforming to ASTM C618 for Class N or Class F materials and in accordance with CBC Section 1903A.6.
 1. Class C is not permitted.
 2. Proportions: Not more than 15 percent (by weight) may be substituted for portland cement.

2.5 ADMIXTURES

- A. Water Reducing Admixture: Admixture to improve placing, reduce water cement ratio and ultimate shrinkage; "WRDA 64" by GCP Applied Technologies, or equal conforming to ASTM C494/C494M and ACI 318 Section 3.6.
 1. Water reducing admixture may be used subject to prior approval by the Architect, Engineer, and the Testing Lab.
 2. Proposed product and quantity shall be included in original design mix.
- B. Air-Entraining Admixture: "Daravair 1000" by GCP Applied Technologies or equal conforming to ASTM C260 and ACI 318, section 26.4.1.4.
 1. Proportion air entraining concrete to attain specified minimum 28-day compressive strength.

2. Total air entrainment in concrete shall be not less than 4 percent or more than 6 percent of the volume of concrete.
- C. Glare Reduction Colorant: Concentrated pigment dispersions designed to permanently color concrete; "Chromix L10 Base-Black" by Sika Corporation, or equal. *Was within 2.2 H.1*

2.6 CURING MATERIALS

- A. Clear Curing Compound: Water-based membrane-forming concrete curing compound in accordance with ASTM C309 and C1315; "Aqua Resin Cure Clear" by Burke CO, "1100" by W.R. Meadows, or equal.

2.7 ADDITIONAL MATERIALS AND COMPONENTS

- A. Concrete Bonding Agent: The following, or equal, conforming to ASTM C1059/C1059M.
 1. "Weld-Crete" by Larson Products Corporation, 800-633-6668.
 2. "Daraweld C" by GCP Applied Technologies, 877-423-6491.
- B. Patching Mortar: One-component, trowel applied, migrating-corrosion-inhibitor enhanced, polymer-modified, shrinkage-compensated, fiber reinforced, micro-silica enhanced, cementitious repair mortar for horizontal, vertical, and overhead applications; "Meadow-Crete GPS" by W.R. Meadows, or equal.
- C. Non-Shrink Grout: Premixed, non-metallic, no chlorides, non-staining and non-shrinking conforming to ASTM C1107/C1107M; "MasterFlow 713" by Master Builders Solutions, a division of BASF, 800-433-9517, or equal.
- D. Drainage Rock Base: 3/4-inch aggregate size conforming to Class 2 Aggregate Base as defined in Caltrans Standard Specifications Section 26, or equal clean free-draining gravel or crushed rock as recommended by the Geotechnical Engineer.
- E. Expansion Joint Material: Preformed 3/8-inch fiber material, with bituminous binder manufactured for use as concrete expansion joint material and conforming to ASTM D1751 and approved by Architect.
 1. Furnish joint fillers in one-piece lengths for full width being placed, wherever possible. Where more than one length is required, lace or clip joint-filler sections together.
- F. Joint Sealant for Expansion Joints in Concrete: Weather and UV resistant, single component, cold applied silicone sealant, Type S, conforming to ASTM D5893/D5893M; ASTM C920, Grade P, Class 25, Use T.
 1. Self-Leveling: "DOWSIL 890-SL Silicone Joint Sealant" by Dow Chemical Company, or equal.
 2. At Slopes Exceeding 5 Percent: Non-sagging; "DOWSIL 888 Silicone Joint Sealant" by Dow Chemical Company, or equal.
 3. Color: As standard with manufacturer.

- G. Pre-Formed Plastic Expansion Joint Caps: Polystyrene, with removable tops; "Snap Cap" by W. R. Meadows, Tex-Trude expansion caps, or equal.
- H. Truncated Domes: Vitrified Polymer Composite (VPC) cast-in-place detectable/tactile warning surface tiles complying with Americans with Disabilities Act (ADA) and the California Code of Regulations (CCR) Title 24, Part 2, Chapter 11B; "Armor-Tile", "Access Tile Tactile Systems," or equal.
 - 1. Color: Shall be yellow and approximate 33538 of GSA/SAE AMS-STD-595A in accordance with CBC Section 11B-705.1.1.3.1.
- I. Traffic Paint for Accessibility Striping at Stairs: VOC compliant, water-based, vinyl acrylic copolymer fast drying emulsion and specifically formulated as a traffic marking paint; "Setfast" with "Duckback" abrasive additive by Sherwin-Williams, "SAFE-STRIDE" by Wooster Products, Inc., or equal.
 - 1. Colors: As selected by Architect. [Yellow]
- J. Cast Abrasive Accessibility Strips and Stairs: Extruded aluminum with integral anchor and filled with abrasive granules in epoxy binder; Model ST-SF-N by Nystrom, Inc., 800-547-2635, Type T-24 by American Safety Tread Company, Inc., 800-245-4881, Type WP-24A by Wooster Products, Inc., 330-264-2844, or equal.
 - 1. Colors: As selected by Architect. [Yellow]

2.8 CONCRETE DESIGN AND CLASS

- A. Designed Strength and Classes of Concrete: The following mixes are not applicable to concrete items exceeding 4 feet in height above the adjacent grade.
 - 1. Class "B": Concrete shall have 1 inch maximum size aggregate, shall have 3000 pounds per square inch minimum at 28 day strength with a maximum water to cementitious ratio no greater than 0.50.
 - a. Location of Use: Exterior slabs, including walks, vehicular paved surfaces, manhole bases, poured-in-place drop inlets, curbs, valley gutters, curb and gutter, and other concrete of like nature.
 - 2. Class "D" concrete of 1 inch maximum size aggregate shall have 3500 pounds per square inch 28 day strength with a maximum water to cementitious materials ratio of 0.55.
 - a. Location of Use: Footings and retaining walls not attached to buildings, and planter walls, monument signs, and other site concrete not described for use in Class "B".
- B. Slump Limits: Provide concrete, at point of final discharge of proper consistency as tested in accordance with ASTM C143/C143M with slumps of 4 inches, plus or minus 1 inch.
- C. Mix Design: Concrete shall be designed for strength in accordance with provisions of CBC Section 1905A.

1. Should the Contractor desire to pump concrete, a modified mix design will need to be submitted for review.
 2. Fly ash may be used in concrete to improve workability in amounts up to 15 percent of the total cementitious weight.
- D. Air Entrainment: Provide at concrete paving / flatwork, including concrete ramps and stairs in accordance with local jurisdiction minimum requirements, but no less than 3 percent of the volume of concrete.
- E. Glare Reduction Additive:
1. General:
 - a. Provide at exterior concrete slabs, walks, ramps, stairs, including bleachers, and other exposed flatwork to eliminate glare.
 - b. Omit glare reduction colorant where color hardener, integral color, and stain treatment of concrete are scheduled.
 2. Quantity: As required to match approved sample but not exceed 2 pounds of colorant per cubic yard of concrete.
 3. Add colorant to mix in accordance with manufacturer's printed instructions.
- F. Coloring Agent:
1. Quantity: Add pigment as required to result in hardened concrete color consistent with approved sample but not exceeding maximum dosage per sack of cement as recommended by manufacturer based on total cementitious materials of mix design.
 2. Add pre-mixed colorant bags to mix in accordance with manufacturer's printed instructions.

2.9 MIXING OF CONCRETE

- A. Conform to requirements of CBC Chapter 19A.
- B. Concrete shall be mixed until there is uniform distribution of material and mass is uniform and homogenous; mixer must be discharged completely before the mixer is recharged.
- C. Concrete shall be Ready-Mixed Concrete: Mix and deliver in accordance with the requirements set forth in ASTM C94/C94M and ACI 301. Batch Plant inspection may be waived in accordance with CBC Section 1705A.3.3, when approved by the Project Engineer and DSA.
1. Furnish batch certificates for each batch discharged and used in the work.
 2. Approved Testing Laboratory shall check the first batching at the start of the work and furnish mix proportions to the Licensed Weighmaster.
 3. Licensed Weighmaster shall identify materials as to quantity and to certify to each load by ticket.
 4. Delivery tickets are to accompany each truck and shall be kept in the job superintendent's file. Delivery tickets must indicate the following information or be subject to rejection:

- a. Name of Project.
 - b. Supplier of concrete.
 - c. Truck identity and ticket serial number.
 - d. Date of delivery.
 - e. Brand of cement.
 - f. Cement content.
 - g. Strength classification.
 - h. Batching time.
 - i. Point of deposit.
 - j. Total amount of water.
 - k. Weight of aggregate.
 - l. Daily temperature.
 - m. Number of cubic yards in load.
 - n. Admixture content.
 - o. Name of Contractor.
 - p. Name of driver.
 - q. Time loaded and first mixing of concrete.
 - r. Reading of revolution counter.
 - s. Color additive.
5. Ticket shall be transmitted to Project Inspector by truck driver with load identified thereon. Project Inspector will not accept load without load ticket identifying mix and will keep daily record of pours, identifying each truck, its load and time of receipt, and will transmit two copies of record to DSA.
6. At end of project, Weighmaster shall furnish affidavit to DSA on form satisfactory to DSA, certifying that all concrete furnished is in conformance with proportions established by mix designs.
7. Placement of concrete shall occur as rapidly as possible after batching and in a manner which will assure that the required quality of the concrete is maintained. In no case may concrete be placed more than 90 minutes from batch time.
- a. When air temperature is between 85 and 90 degrees F, reduce maximum batching to discharge time from 90 minutes to 75 minutes.
 - b. When air temperature is above 90 degrees F, reduce maximum batching to discharge time to 60 minutes.
8. Water may be added to the mix only if neither the maximum permissible water-cement ratio nor the maximum slump is exceeded.
- a. The quantity of water used for each batch shall be accurately measured.
 - b. In no case shall more than 10 gallons of water be added to a full 9-yard load, or 1 gallon per yard on remaining concrete within the drum, providing load tag indicates at time of mixing at plant an allowance for additional water.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Confirm general layout, grade, and joint pattern layout with the Architect prior to placing concrete.
- B. Verify that gradients and elevations of the base are correct, and that the base is dry.
- C. Contractor shall report in writing to the Architect prevailing conditions that will adversely affect satisfactory execution of the work of this Section.
 - 1. Do not proceed with work until unsatisfactory conditions have been corrected.
- D. Forms and reinforcements are subject to approval by the Project Inspector as specified in Article FIELD QUALITY CONTROL.

3.2 PREPARATION

- A. Remove frost, water, and other foreign materials from form surfaces, reinforcement, and embedded items against which concrete will be placed.
- B. When the ambient temperature necessitates the use of cold or hot weather concreting, make provisions in advance of concrete placement.
- C. Before placing concrete, clean tools and equipment, and remove debris from areas to receive concrete.
- D. Clean reinforcing and other embedded items of coatings, oil, mud and soil that may impair bond with concrete.
- E. Slab-On-Grade: After subgrade has been approved by Geotechnical Engineer, install specified drainage rock base material to thickness shown. Rock base shall be implemented and compacted in accordance with the Geotechnical Report and recommendations of the Geotechnical Engineer.

3.3 INSTALLATION – FORMWORK

- A. Form material shall be straight, true, sound and able to withstand deformation due to loading and effects of moist curing. Materials which have warped or delaminated, or require more than minor patching of contact surfaces, shall not be reused.
- B. Build forms to shapes, lines, grades and dimensions indicated. Construct formwork to maintain tolerances required by ACI 301. Forms shall be substantial, tight to prevent leakage of concrete, and properly braced and tied together to maintain position and shape. Butt joints tightly and locate on solid backing. Chamfer corners where indicated. Form bevels, grooves and recesses to neat, straight lines. Construct forms for easy removal without hammering, wedging or prying against concrete.
- C. Space clamps, ties, hangers and other form accessories so that working capacities are not exceeded by loads imposed from concrete or concreting operations.

- D. Build openings into vertical forms at regular intervals if necessary to facilitate concrete placement, and at bottoms of forms to permit cleaning and inspection.
- E. Build in securely braced temporary bulkheads, keyed as required, at planned locations of construction joints.
- F. Before placement of reinforcing steel, coat faces of all forms to prevent absorption of moisture from concrete and to facilitate removal of forms. Apply specified material in conformance with manufacturer's written directions.
 - 1. Seal all cut edges.
 - 2. Before re-using form material, inspect, clean thoroughly, and recoat.
- G. Slope tie-wires downward to outside of wall.
- H. Brace, anchor and support all cast-in items to prevent displacement or distortion.
- I. During and immediately after concrete placing, tighten forms, posts and shores. Readjust to maintain grades, levels and camber.
- J. Concrete Paving, Curbs, Curb and Gutters, Ramps:
 - 1. Expansion Joints: Install at locations indicated, and so that maximum distance between joints is 20 feet for exterior concrete unless otherwise shown. Expansion joint material shall be full depth of concrete section. Recess for snap cap and sealant when required.
 - 2. Curbs, Valley Gutter, and Curb & Gutter: Install expansion joints at 60 feet on center, except when placing adjacent to concrete walks, the expansion joints shall align with the expansion joints shown for the concrete walks. Expansion joint material shall be full depth of concrete section. Recess for snap cap and sealant when required.
 - 3. Isolation Joints: 3/8-inch felt between walls and exterior slabs or walks so that paved areas are isolated from all vertical features, unless specifically noted otherwise on plans.
 - 4. Exterior Concrete Paving: Install expansion joints at 20 feet on center maximum, both directions, unless shown otherwise on plans.
 - 5. Ramps: Whether shown or not, all ramps shall have control joints and expansion joints.
 - a. Control joints on ramps shall be aligned and placed in between the vertical posts for the handrails. The curbs, if required shall have control joints that align with the handrail posts.
 - b. Expansion joints shall be placed at the upper, intermediate, and bottom landings.
- K. Inspection: Refer to Article FIELD QUALITY CONTROL.

3.4 INSTALLATION – REINFORCING

- A. General: Reinforcing shall be accurately placed at locations indicated on the drawings within required tolerances and providing required clearances. Reinforcement shall be

secured prior to placement of concrete such that tolerances and clearances are maintained. Coverage shall be in accordance with Section 1907A.7 of the CBC.

1. Reinforcement must be in place before concreting is begun.
 2. Keep a person on the job to maintain position of reinforcing as concrete is placed.
 3. All expansion and construction joints in concrete shall have dowels of size and spacing as shown on the Drawings, or as approved by Architect.
 4. Give notice whenever pipes, conduits, sleeves, and other construction interferes with placement; obtain method of procedure to resolve interferences.
- B. Additional reinforcing steel shall be placed around all utility boxes, valve boxes, manhole frames and covers that are located within the concrete placements.
1. The bars shall be placed so that there will be a minimum of 1-1/2-inch clearance and a maximum of 3-inch clearance. The reinforcing steel shall be placed mid-depth of concrete slab.
- C. At right angles or intersections of concrete walks, additional 2 feet x 2 feet #5, 90 degree bars shall be added at all inside corners for additional crack control. The bars shall be placed 2 inches from concrete forms and supports, at mid-depth of slab.
- D. Reinforcing steel shall be adequately supported by approved devices on centers close enough to prevent any sagging.
- E. Placing Tolerances:
1. In accordance with ACI 301 or CRSI/WCRSI Recommended Practice for Placing Reinforcing Bars, unless otherwise shown.
 2. Clear distance between parallel bars in a layer shall be no less than 1 inch, the maximum bar diameter shall not exceed 1-1/2 times the maximum size of coarse aggregate.
- F. Splices:
1. General: Unless otherwise shown on drawings, splice top reinforcing at midspan between supports, splice bottom reinforcing at supports, and stagger splices. Bar laps shall be wired together. Reinforcing steel laps shall be as follows:
 - a. Length of Lap Splices in Concrete:
 - 1) No. 4 bar: 24 inches minimum.
 - 2) No. 5 Bar: Not less than 62 bar diameters.
 - 3) No. 6 Bar: 56 inches minimum.
 - 4) No. 7 Bars and Larger: Not less than 93 bar diameters.
 - b. All splices shall be staggered at 5 feet minimum from adjacent splices.
- G. Inspection: Refer to Article FIELD QUALITY CONTROL.

3.5 PLACING OF CONCRETE – GENERAL

- A. Adjacent finish surfaces shall be protected at all times during the concrete pour and finishing. Verify that all formwork is tight and leak-proof before concrete is poured. Finish work defaced during the concrete pour and finishing shall be replaced at no extra cost to Owner.
- B. Remove wood chips, sawdust, dirt, loose concrete and other debris just before concrete is to be poured. Use compressed air for inaccessible areas. Remove all standing water from excavations.
- C. Transport concrete from mixer to place of final deposit as rapidly as practicable by methods which will prevent separation or loss of ingredients. Deposit as close as practicable in final position to avoid re-handling or flowing. Partially hardened concrete must not be deposited in work. Concrete shall not be wheeled directly on top of reinforcing steel.
- D. Keep excavations free of standing water, but moisture condition sub-grade before concrete placement.
- E. Placing: Once started, continue concrete pour continuously until section is complete between predetermined construction joints. Prevent splashing of concrete onto adjacent forms or reinforcement and remove such accumulation of hardened or partially hardened concrete from forms or reinforcement before work proceeds in that area. Free fall of concrete shall not to exceed 4'-0" in height. If necessary, provide lower openings in forms to inject concrete and to reduce fall height.
- F. Remove form spreaders as placing of concrete progresses.
- G. Place footings as monolithic and in one continuous pour.
- H. Compacting: Concrete shall be compacted by mechanical vibrators.
 - 1. Concrete shall be thoroughly worked around reinforcement and embedded fixtures and into corners of forms.
 - 2. Vibrating shall not be applied to concrete which has already begun to initially set or be continued so long as to cause segregation of materials.

3.6 REMOVAL OF FORMS

- A. Remove without damage to concrete surfaces.
 - 1. Sequence and timing of form removal shall insure complete safety of concrete structure.
 - 2. Forms shall remain in place for not less than the following periods of time. These periods represent cumulative number of days during which temperature of air in contact with concrete is 60 degrees F and above.
 - a. Vertical Forms of Foundations, Walls and All Other Forms Not Covered Below: 5 days.
 - b. Concrete Paving Edge Screeds or Forms: 7 days.

3. Concrete shall not be subjected to superimposed loads (structure or construction equipment) until it has attained its full design strength and not for a period of at least 21 days after placing. Concrete systems shall not be subjected to construction loads in excess of design loads.
- B. Patching: Install specified patching mortar per manufacturer's recommendations. Repairs to defective concrete which affect the strength of any structural concrete member or component are subject to approval by the architect and DSA.

3.7 CONCRETE PAVING

- A. Concrete paving shall be formed and finished to required line and grades true and flat with a maximum tolerance of 1/8-inch in 10 feet for flatness and to slopes indicated.
- B. Concrete vibrator shall be used to assist concrete placement. Contractor shall have spare concrete vibrator on site during concrete placement.
- C. Thoroughly water and soak the subgrade of exterior concrete paving, curbs, curb and gutters, with multiple daily waterings for at least three days or as required to achieve required moisture content prior to the concrete pour in order to place the subgrade soils in full expansion.
 1. Provide damming as required to keep standing water within the formed area and to allow for proper saturation and full expansion of the subgrade soils.
 2. Remove standing water before concrete placement.
- D. Construction Joints:
 1. Keep exposed concrete face of construction joints continuously moist from time of initial set until placing of concrete; thoroughly clean contact surface by chipping entire surface not earlier than 5 days after initial pour to expose clean hard aggregate solidly embedded, or by approved method that will assure equal bond, such as green cutting.
 2. If contact surface becomes contaminated with soil, sawdust or other foreign matter, clean entire surface and re-chip entire surface to assure proper adhesion.

3.8 FINISHING

- A. Concrete Paving: Finish surface as required by ACI 302.1R using manual and vibrating screeds to place concrete level and smooth.
 1. Under no circumstances shall water be added to the top surface of freshly placed concrete.
 2. Use "jitterbugs" or other special tools designed for the purpose of forcing the course aggregate below the surface leaving a thick layer of mortar 1 inch in thickness.
 3. After tamping the concrete, wood float surface to a true and even plane.
 4. After floating with a wood bull float, make 2 passes with a steel Fresno trowel to start sealing the concrete surface.

5. While concrete is still wet but sufficiently hardened to bear a persons' weight on knee boards, start troweling with a steel hand trowel or a machine trowel in larger areas. Use sufficient pressure to bring moisture to surface.
 6. After surface moisture has disappeared, finish concrete utilizing steel, hand or power trowel.
 7. Completed surface shall be free from trowel marks, depressions, ridges or other blemishes. Tolerance for flatness shall be 1/8-inch in 10 feet.
 8. Provide final finish as follows, unless otherwise indicated:
 - a. Medium Broom Finish: Typical finish to be used at all exterior walks, stairs and ramps. Brooming direction shall run perpendicular to slope to form non-slip surface.
- B. Curb Finish: Steel trowel.
- C. Joints and Edges:
1. Mark-off exposed joints, where indicated, with 1/4-inch radius x 1 inch deep jointer or edging tool. Joints shall be clean, cut straight and parallel or square with respect to concrete walk edge.
 2. Tool edges of control joints, walk edges, and wherever concrete walk adjoins other material or vertical surfaces. Expansion joints shall be constructed as detailed on plans.
 3. The expansion joints shall be full depth as shown in the Drawings. Failure to do so will result in non-compliance and shall be immediately machine cut by the Contractor at its expense.

3.9 CURING

- A. Formed Concrete:
1. Keep forms and top on concrete between forms continuously wet until removal of forms, 7 days minimum.
 2. Maintain exposed concrete in a continuous wet condition for 14 days following removal of forms.
- B. Concrete Paving, Curb, Curb and Gutter, Valley Gutter:
1. Cure utilizing curing compound. If applicable, the Contractor shall verify that the approved curing compound is compatible with the approved colorant system.
 2. Curing compound shall be applied in a wet puddling application. Spotty applications shall be reason for rejection and possibly concrete removal and replacement at the contractor's expense with no compensation from the Owner.
- C. No curing compound shall be applied to areas scheduled to receive resilient track surface including, curbs, ramps, runways, and similar items.

3.10 DEFECTIVE CONCRETE

- A. General:

1. Determination of defective concrete shall be made by the Architect or Engineer whose opinion shall be final in identifying areas to be replaced, repaired or patched.
2. As directed by Architect, cut out and replace defective concrete.
 - a. Defective concrete shall be removed from the site.
 - b. No patching is to be done until surfaces have been examined by Architect and permission to begin patching has been provided.
 - c. Permission to patch an area shall not be considered waiver of right by the Owner to require removal of defective work, if patching does not, in opinion of Architect, satisfactorily restore quality and appearance of surface.
 - d. Remove and replace concrete if repair to an acceptable condition is not feasible.

B. Defective Concrete Is:

1. Concrete that does not match the approved mix design for the given installation type.
2. Concrete not meeting specified 28-day strength.
3. Concrete which contains rock pockets, voids, spalls, transverse cracks, exposed reinforcing, or other such defects which adversely affect strength, durability or appearance.
4. Concrete which is incorrectly formed, out of alignment or not plumb or level, or outside of the maximum tolerance for flatness and slopes indicated.
5. Concrete containing embedded wood or debris.
6. Concrete having large or excessive patched voids which were not completed under Architect's direction.
7. Concrete not containing required embedded items.
8. Concrete with excessive shrinkage, transverse cracking, crazing, curling; or defective finish.
9. Concrete that is unsuitable for placement or has set in truck drum for longer than 90 minutes from the time it was batched.
10. Concrete where expansion joint filler that is not isolating the full depth of the concrete section, and not recessed as required for backer rod and sealant where required.
11. Concrete that is excessively wet or excessively dry and will not meet the minimum or maximum slump required per mix design.
12. Finished concrete with oil stains from equipment use, and or rust spots that cannot be removed.
13. Concrete with control joints (weakened planed joints) that do not meet the required minimum depth shown on the drawings.
14. Concrete not meeting slip-resistance requirements.

C. Flatwork: The Owner reserves the right to survey the flatwork, to determine if flatwork is outside of the maximum tolerance for flatness and slopes as indicated.

1. If the flatwork is found to be out of tolerance, then the Contractor is required to replace concrete at no additional expense to the Owner.
2. Determination of flatwork flatness, surveying and remedial work must be completed far enough in advance so that the project schedule is maintained, delays are avoided, and the new flatwork or flatwork repairs are properly cured.
3. The Contractor will be responsible for reimbursing the Owner for costs associated with re-surveying to verify compliance of work remediated by the Contractor.

3.11 SEALANT

- A. Apply sealant in compliance with manufacturer's instructions, using hand guns or pressure equipment with proper nozzle size, on clean, dry, properly prepared substrates.
- B. Force sealants into joint against sides of joint to make uniform. Avoid pulling of the sealant from the sides. Fill sealant space completely with sealant.
- C. Finished joints shall be straight, uniform, smooth, and neatly finished.
- D. Remove any excess sealant from adjacent surfaces of joints utilizing the manufacturer's recommended solvent and cleaning processes. Leave the work in a neat, clean condition.

3.12 FIELD QUALITY CONTROL

- A. Inspection of Forms and Reinforcing:
 1. Approval of forms and reinforcing steel must be received from Project Inspector prior to pouring concrete.
 2. Notice of readiness to place first pour shall be given to Project Inspector, DSA, Architect, and Engineer not less than 48 hours prior to placement of concrete to allow for inspection.
 3. Pouring of concrete shall not proceed prior to completing requested adjustments to forms and reinforcing and without approval of Project Inspector.
- B. Testing of Concrete:
 1. Frequency and Samples for Testing:
 - a. Four identical cylinder samples for strength tests of each class of concrete placed each day shall be taken not less than once a day, or not less than once for each 50 cubic yards of concrete, or not less than once for each 2,000 square feet of surface area for slabs or walls.
 - b. In addition, samples for strength tests for each class of concrete shall be taken for seven-day tests at the beginning of the concrete work or whenever the mix or aggregate is changed.
 2. Testing:
 - a. Slump: Each truck's concrete shall be tested for slump before concrete is placed.
 - b. Strength:

- 1) Tests for strength will be conducted by Testing Agency on one cylinder at 7 days and two cylinders at 28 days. The fourth remaining cylinder will be available for testing at 56 days if the 28-day cylinder test results do not meet the required design strength.
 - 2) On a given project, if the total volume of concrete is such that the frequency of specified testing would provide less than five strength tests for a given class of concrete, tests shall be made from at least five randomly selected batches or from each batch if fewer than five batches are used.
- C. Slip-Resistance Testing: Owner's Testing Agency will perform testing on flatwork to verify compliance with specified slip-resistance.
1. The coefficient of friction will be measured by California Test 342 before pavement is opened to public traffic, but not sooner than 7 days after concrete placement
 2. Where paving is determined to have a coefficient of friction less than 0.30, Contractor is to repair and/or replace these surfaces at no cost to Owner.

3.13 CLEANING

- A. Upon completion of work of this Section promptly remove from the working area all scraps, debris and surplus material of this Section.
- B. Clean excess material from surface of all concrete walks and utility structures.
- C. Power wash concrete surfaces to remove stains, dried mud, tire marks, and rust spots.
- D. Comply with any additional requirements of additive manufacturer for colored concrete.

3.14 PROTECTION

- A. Graffiti-resistant Coating:
 1. Surface Preparation: Prepare concrete surface to receive graffiti-resistant coating specified in Section 09 9623, Graffiti-Resistant Coatings, where indicated.
 2. Concrete must be clean, dry, and free of efflorescence and dust.
- B. Protect work and materials of this Section prior to and during installation, and protect the installed work and materials of other trades.
- C. In the event of damage during construction, make all repairs and replacements necessary to the approval of the Architect, at no additional cost to the Owner.

END OF SECTION

PART 1 – GENERAL

1.1 WORK INCLUDED

Provide all labor, materials, and tools necessary for the complete installation of a poured in place safety surfacing system composed of a wearing layer upper membrane and an underlying impact attenuation cushion layer as outlined in these specifications. The system should consist of but not necessarily be limited to the following:

- A. Section includes: Resilient playground surfacing poured in place system.
- B. Related work: Playground equipment and resilient playground surfacing sub base.
- C. Quality Assurance: Manufacturer should have manufactured and installed playground poured in place safety surfaces for a minimum of 5 years and meet current ASTM F-1292 Test Criteria. The installation of the poured in place product should be completed by FLEXGROUND. Manufacturer's detailed installation procedures should be submitted to the Architect and made part of the Bid Specifications.

1.2 SUBMITTALS

Prospective manufacturers and/or installers of the poured in place safety surfacing system should be required to comply with the following:

- A. The manufacturer must be experienced in the manufacturing of a poured in place safety surfacing system and provide references of five (5) specific installations in the last three (3) years.
- B. The installer must provide competent workmen skilled in this specific type of poured in place safety surfacing system installation. The designated supervisory personnel on the project must be competent in the installation of this material, including mixing of the materials, and spreading and compacting the materials correctly.
- C. Installation should be in accordance with ASTM F1292 for Impact Attenuation of surface system under and around playground equipment. The poured in place system to be installed in compliance with the Critical Fall Height as determined by the Playground Equipment.
- D. IPEMA Certification specific to poured in place safety surfacing.
- E. IPEMA certification specific to ½" layer of 1-4mm TPV over cushion layer .5mm TPV or EPDM IPEMA certification not acceptable.
- F. Manufacturer should provide written instructions for recommended maintenance practices.
- G. Manufacturer should submit color samples for customer verification. Color samples shall be 6" x 6" of ½" top wear course layer with aromatic or aliphatic binder – per client selection or specification; or 8 oz clear plastic jars with specified colored granules. Sample submittal format per client preference.

1.3 DEFINITIONS

PLAYGROUND PROTECTIVE SURFACES
SECTION 32 1816.13
3595001

- A. EPDM granules: EPDM rubber (ethylene propylene diene monomer (M-class) rubber), a type of synthetic rubber, is an elastomer characterized by a wide range of applications. The M refers to its classification in ASTM standard D-1418; the M class includes rubbers having a saturated chain of the polymethylene type.
- B. Critical Fall Height: A critical fall height (CFH) is the maximum height of fall from play equipment to the ground. It is important to note that safety surfaces do not prevent injury but aim to lessen the severity of any injury that may occur on falls from height.
- C. Fall Height: Fall height is a measurement defined as the vertical distance between a designated play surface and the protective surfacing beneath it.
- D. TPV: Thermoplastic Vulcanized Elastomer. Developed using resin and synthetic rubber with higher UV stabilization.
- E. SBR: Styrene-butadiene or styrene-butadiene rubber (SBR) describe families of synthetic rubbers derived from styrene and butadiene.

1.4 ASTM TESTING STANDARDS – FlexGround Standard meets or exceeds all required ASTM standards below.

- A. ASTM D624 Standard Test Method for Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomers.
- B. ASTM D2859 Standard Test Method for Flammability of Finished Textile Floor Covering Materials
- C. ASTM E303 Standard Test Method for Measuring Surface Frictional Properties Using the British Pendulum Tester
- D. ASTM F1292 Standard Specification for Impact Attenuation of Surface Systems Under and Around Playground Equipment
- E. ASTM F1951 Standard Specification for Determination of Accessibility of Surface Systems Under and Around Playground Equipment
- F. ASTM C1028 Standard Test Method for Determining the Static Coefficient of Friction of Ceramic Tile and Other Like Surfaces by the Horizontal Dynamometer Pull Meter Method – This standard replaces ASTM D2047
- G. ASTM D412 Standard Test Methods for Vulcanized Rubber and Thermoplastic Rubbers and Thermoplastic Elastomers- Tension

1.5 WARRANTY AND MAINTENANCE

The bidder and/or poured in place safety surfacing manufacturer must provide the following:

- A. The poured in place safety surfacing manufacturer should provide a warranty to the owner that covers defects in materials and workmanship of the rubber for a period of **FIVE (5) years** from the date of Substantial Completion.

PLAYGROUND PROTECTIVE SURFACES
SECTION 32 1816.13
3595001

- B. The manufacturer's warranty should include general wear and tear. The warranty should specifically exclude vandalism, high heel punctures, acts of war or acts of nature beyond the control of the owner or the manufacturer.
- C. All poured in place warranties should be limited to repair or replacement of the affected areas and should include all necessary materials, labor, transportation costs, etc. to complete said repairs. All warranties are contingent on the full payment by the owner of all pertinent invoices and adherence to any required maintenance procedures.
- D. The installer should clean the jobsite of excess materials and, if necessary, backfill any excavation around the perimeter with earth or other appropriate fill material.
- E. The manufacturer should instruct the owner's personnel on proper maintenance and repair of the ENDURAFLEX safety surface.

PART 2 – PRODUCTS

- A. The FLEXGROUND ENDURAFLEX, or equal, poured in place safety surfacing system should be in accordance with the following:
- B. A dual durometer poured in place system with a wearing layer upper membrane and an underlying impact attenuation cushion layer. The finished surface should be porous and capable of being installed at varying thickness to comply with the Critical Fall Height requirements of the playground equipment.
- C. FLEXGROUND primer is a 100% solids urethane primer/sealer. It is designed with low viscosity and penetrating abilities making this an ideal priming urethane.
- D. The cushion layer should be a mixture of black recycled SBR rubber buffings mixed with a 100% solids moisture cured MDI Polyurethane binder or aliphatic (100 pounds of SBR rubber buffings to 12 pounds of binder) installed at the appropriate thickness. As an upgrade, or if recycled SBR rubber buffings are not available, 5/8" chunk rubber with correct amount of urethane for impact attenuation and longevity may be used. **Chunk rubber shall not include SBR derived from rubber tires.** It must be high quality preconsumer recycled rubber containing EPDM. The cushion layer should be porous.
- E. The ENDURAFLEX wearing surface should be manufactured from 1-4mm Thermoplastic Vulcanized (TPV) virgin colored rubber granules bonded by FLEXGROUND binder, 100% solids moisture cured Polyurethane binder or aliphatic (110 pounds of TPV to 22 pounds of binder), and applied to a minimum thickness of 1/2" (12.7 mm) over the cushion layer.
- F. The system color should be selected from Manufacturer's Color Chart by owner prior to bid.
- G. High Wear Coating: Flexgrout as manufactured by Flexground, or corresponding equal.

PART 3 – EXECUTION

3.1 GENERAL

PLAYGROUND PROTECTIVE SURFACES
SECTION 32 1816.13
3595001

- A. Install all systems in full accordance with manufacturer's recommendations.
- B. Slope across finished product shall not be greater than 2% in any direction. Contractor shall carefully checked grades during installation of perimeter curb and play equipment access points to assure that all slopes are less than 2%.

3.2 SITE PREPARATION AND BASE

The ENDURAFLEX site preparation and base should be in accordance with the following:

- A. The sub-base will have a slope as per design.
- B. The base aggregate should consist of free-draining stone compacted to 95%, thickness per plan. Finish slope of porous aggregate should be 2% from the centerline of the area to the perimeter, and the grade should not vary more than a quarter inch (1/4") in ten feet (10').
- C. The sub-base should be compacted using vibrating tamper, to approximately 95% Proctor density.
- D. The sub-grade should no longer have any vegetation.
- E. Subgrade prior to aggregate installation: Sublevel grade is to be compacted prior to the ABC aggregate installation. Particular attention should be paid to areas of disturbed earth such as where footers for playground equipment enter the ground. Concrete should be poured to the top of sublevel surface.
- F. The poured in place safety surfacing manufacturer and architect will accept the aggregate base in writing prior to the installation of the poured in place system.
- G. Any alterations must be agreed between all parties.

3.3 INSTALLATION

- A. The poured in place safety surfacing installer should strictly adhere to the installation procedures outlined under these sections. Any variance from these requirements should be accepted in writing by the manufacturer's onsite representative and submitted to the architect/owner, verifying that the changes do not in any way affect the warranty.

3.4 PERIMETER

- A. A urethane primer should be applied to concrete, asphalt or wood surfaces at a rate of 200-250 square feet per gallon. The entire area does not need to be primed at once, instead, prime about 700 square feet at a time. This procedure should be continued until all areas are complete.
- B. The urethane primer should be applied to any playground equipment that will be surrounded by the poured in place safety surfacing system.

3.5 CUSHION LAYER

- A. Provide a single pour installation for each area. No seams allowed in material.

PLAYGROUND PROTECTIVE SURFACES
SECTION 32 1816.13
3595001

- B. The components of the poured in place safety surfacing should be mixed on site in a mixer to ensure a comprehensive mix according to manufacturer's instructions.
- C. The cushion layer comprised of SBR buffings shall be mixed with the MDI moisture cure polyurethane binder at a rate of 12% of the total weight of the material thoroughly so that the binder is evenly dispersed into the rubber base.
- D. The cushion layer comprised of non-tire derived SBR & EPDM Chunk Rubber shall be mixed with the appropriate amount of urethane so that the binder is evenly dispersed into the rubber base.
- E. The cushion layer mix should then be spread and troweled to the desired depth and allow to cure for 24 hours.

3.6 WEAR COURSE LAYER

- A. Provide a single pour installation for each area. No seams allowed in finished product.
- B. The wear course layer should be mixed with 1-4mm TPV granules and urethane binder at a rate of 20% of the total weight of the materials so the granules are covered thoroughly and evenly.
- C. The wear course layer mix should be spread and troweled to a depth of a half inch ($\frac{1}{2}$ ") immediately after the application of primer.
- D. Where seams are required due to color change, a step configuration with a 4" overlap will be constructed to maintain wear surface integrity.
- E. The finished texture should be slip resistant, smooth and even.
- F. The poured in place surface should be allowed to cure for 24-72 hours or until dry to the touch.

3.7 GROUT SEALER AT HIGH WATER AREAS

- A. Provide at base of main access point to structure, at bottom of slides, beneath swings, other high traffic, high wear areas.
- B. The wear course layer should be sealed with a thermoplastic composite grout. FLEXGROUT should be spread with a trowel at a rate of 1 gallon per 30 square feet. Pressure should be applied to the trowel with enough force to push the grout into the wear course layer, rendering it impermeable. The finished texture should be slip resistant and even.
- C. The poured in place surface should be allowed to cure for 24-72 hours or until dry to the touch.
- D. Color Seal - The color seal should consist of a water based composite liquid. Color seal should be rolled (or can be sprayed) to completely cover entire surface. The color seal should be allowed to cure for 24-72 hours or until dry to touch.

3.8 CLEAN UP

PLAYGROUND PROTECTIVE SURFACES
SECTION 32 1816.13
3595001

- A. Trailer/ Large truck access will be necessary for the installation. In the case that access for trailer/truck is not available the owner or general contractor will be responsible for transporting material to the job site.
- B. Crew is responsible for protecting the surface only while on site. General Contractor or owner shall be responsible for the security of the surfacing overnight during installation, as well as during the surfacing's curing period upon completion of the install.
- C. Crew will leave site clean and shall remove all trash and debris.
- D. Owner/General contractor shall provide a dumpster for all waste and trash.

END OF SECTION

PART 1 – GENERAL

1.1 SUMMARY

- A. Provide all labor, materials, equipment, and tools necessary for the complete installation of an attenuated synthetic grass infill system as outlined in these specifications. The system should consist of but not necessarily be limited to the following:
- B. A vertical draining field base consisting of a four-inch layer of compacted $\frac{3}{4}$ " Class 2 aggregate compacted to 95% and four-inch layer of Class 2 permeable base compacted to 90-95% relative compaction.
- C. A complete synthetic grass system, consisting of:
 - 1. Synthetic turf
 - 2. Cushion layer
 - 3. An infill system, consisting of a specially formulated non-expansive, coated, clean, dust free and specially sized silicon dioxide bead (Envirofill brand preferred).
- D. Quality Assurance: Manufacturer should have manufactured and installed synthetic grass surfaces for a minimum of 5 years. Manufacturer's detailed installation procedures should be submitted to the Architect and made part of the Bid Specifications.

1.2 RELATED REQUIREMENTS

- A. Section 01 5000, Temporary Facilities and Controls.
- B. Section 31 0000, Earthwork.
- C. Section 33 4000, Storm Drainage Utilities.

1.3 REREENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. ASTM D624 Standard Test Method for Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomers.
- C. ASTM D2859 Standard Test Method for Flammability of Finished Textile Floor Covering Materials
- D. ASTM E303 Standard Test Method for Measuring Surface Frictional Properties Using the British Pendulum Tester
- E. ASTM F1292 Standard Specification for Impact Attenuation of Surface Systems Under

and Around Playground Equipment

- F. ASTM F1951 Standard Specification for Determination of Accessibility of Surface Systems Under and Around Playground Equipment
- G. ASTM C1028 Standard Test Method for Determining the Static Coefficient of Friction of Ceramic Tile and Other Like Surfaces by the Horizontal Dynamometer Pull Meter Method – This standard replaces ASTM D2047
- H. ASTM D412 Standard Test Methods for Vulcanized Rubber and Thermoplastic Rubbers and Thermoplastic Elastomers- Tension

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Submittal Procedures:
 - 1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
 - 2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
 - 3. Sustainable Design Submittals shall comply with the additional requirements of Section 01 8113, Sustainable Design Requirements.
- B. Coordination:
 - 1. General Contractor shall coordinate work as herein specified, in accordance with drawings and as required to complete scope of work with all related trades.

1.5 ACTION SUBMITTALS

- A. Provide supplier's descriptive literature for all products to demonstrate compliance with specified attributes:

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For contractor / Installer.
Prospective manufacturers and/or installers of the turf should be required to comply with the following:
 - I. The turf manufacturer must be experienced in the manufacture of a no nail synthetic grass system and provide references of five (5) specific installations in the last three (3) years.
 - J. The turf installer must provide competent workmen skilled in no nail synthetic grass installation. The designated supervisory personnel on the project must be competent in the installation of this material, including gluing seams and proper installation of the infill mixture.
 - K. Installation should be in accordance with ASTM F1292 for Impact Attenuation of surface system under and around playground equipment. The poured in place system to be installed in compliance with the Critical Fall Height as determined by the Playground

Equipment (if any).

- L. Manufacturers should provide written instructions for recommended maintenance practices.

1.7 CLOSEOUT SUBMITTALS

- A. Guarantee: Submit subcontractor's guarantee.

1.8 QUALITY ASSURANCE

- A. Contractor / Installer shall have been in business for five (5) years providing/finishing similar size projects and complexity.
- B. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.
- C. All materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.

1.9 DELIVERY, STORAGE AND HANDLING

- A. Transport, store and handle in strict accord with the local jurisdiction.

1.10 FIELD CONDITIONS

- A. Contractor shall acquaint himself with all existing site conditions. If unknown active utilities are encountered during work, notify Architect promptly for instructions. Failure to notify will make Contractor liable for damage to these utilities arising from Contractor's operations subsequent to discovery of such unknown active utilities.
- B. Trench dewatering may be necessary. Contractor shall provide any and all tools, equipment and labor necessary for trench dewatering no matter what the source. Dewatering shall be continuous until all site utilities are installed and backfilled.

1.11 PROTECTION

- A. Adequate protection measures shall be provided to protect workers and passers-by on and off the site. Adjacent property shall be fully protected throughout the operations. Blasting will not be permitted. Prevent damage to adjoining improvements and properties both above and below grade. Restore such improvements to original condition should damage occur. Replace trees and shrubs outside building area disturbed by operations. Repair all trenches in grass areas with new sod (seeding not permitted) and "stake-off" for protection.
- B. Contractor shall be solely and completely responsible for working conditions at the job site, including safety of all persons and property during performance of the work. This requirement shall apply continuously and shall not be limited to normal working hours.
- C. Any construction review of the Contractor's performance conducted by the Architect or Owner is not intended to include review of the adequacy of the Contractor's safety measures, in, on or near the construction site.

SYNTHETIC TURF
SECTION 32 1816.16
3595001

- D. Provide shoring, sheeting, sheet piles and or bracing to prevent caving, erosion or gullyng of sides of excavation.
- E. Surface Drainage: Provide for surface drainage during period of construction in manner to avoid creating nuisance to adjacent areas. Keep all excavations free from water during entire progress of work, regardless of cause, source or nature of water.
- F. Adjacent streets and sidewalks shall be kept free of mud, dirt or similar nuisances resulting from earthwork operations.
- G. The site and adjacent influenced areas shall be watered as required to suppress dust nuisance.
- H. Trees: Carefully protect existing trees which are to remain.

1.12 TRENCH SAFETY PROVISIONS

- A. General Contractor shall be solely responsible for safety design, construction and coordination with agencies having jurisdiction. If such plan varies from shoring system standards established by Construction Safety Orders, plan shall be prepared by registered civil or structural engineer.
- B. Nothing herein shall be deemed to allow use of shoring, sloping or protective system less effective than that required by Construction Safety Orders of California State Division of Industrial Safety.
- C. When trenching through paved surface, provide steel trench plates to cover open trenches daily until trenches are backfilled.

1.13 SEASONAL LIMITS

- A. No backfill material shall be placed, spread or rolled during unfavorable weather conditions. When work is interrupted by heavy rains, full operations shall not be resumed until field tests indicate that moisture content and density of fill are satisfactory.
- B. Material above optimum moisture shall be processed per Section 31 0000, Part 3, Article "Subgrade Preparation".

1.14 TESTING

- A. General: Refer to Section 31 0000, Part 1, Article "Testing" and Part 3, Article "Testing and Observation".

1.15 WARRANTY AND MAINTENANCE

- A. The bidder and/or the turf manufacturer must provide the following:
- B. The turf manufacturer should provide a warranty to the owner that covers defects in materials and workmanship of the turf for a period of **FIVE (5) years** from the date of Substantial Completion, and **TWO (2) years** on seams.
- C. The manufacturer's warranty should specifically exclude vandalism, acts of War and acts of Nature beyond the control of the owner of the manufacturer.

- D. All turf warranties should be limited to repair or replacement of the affected areas and should include all necessary materials, labor, transportation costs, etc. to complete said repairs.
- E. All warranties are contingent upon full payment by the owner of all pertinent invoices and owner, at owner's expense, completing a full power-brooming and "top-off" of lost infill at two-year intervals from date of substantial completion.
- F. The bidder should provide a maintenance program to the owner. The warranty should be subject to compliance with said maintenance program in addition to items named above.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

The synthetic turf material and resilient cushion should be in accordance with the following:

- A. Acceptable Manufacturer: Beyond Grass Premium or Tencate Grass.
- B. Or approved equal.

2.2 SYSTEM REQUIREMENTS

- A. A poured in place system with a synthetic grass wearing layer upper membrane and an underlying impact attenuation cushion layer. The finished surface should be porous and capable of being installed at varying thickness to comply with Critical Fall Height requirements of playground equipment.
- B. The cushion layer should be a mixture of black recycled rubber mixed with a 100% solids moisture cured aromatic Polyurethane binder (100 pounds of rubberized cushion layer to 12 pounds of binder) installed at the appropriate thickness.
- C. Synthetic Turf shall be:
 - 1. A 1-1/2" monofilament polyethylene with brown thatch yarn, formulated for superior wear resistance and a secondary proprietary polyethylene thatch. Product must have built-in antimicrobial protection to inhibit the growth of bacteria, mold, mildew, and reduce odor.
 - 2. The system should be tufted with a minimum of 60 ounce of yarn per square yard. The system should also include a primary woven polypropylene backing and a polyurethane secondary backing. Finish coating shall be at 22 ounces per square yard.
 - 3. The machine gauge shall be 1/2". Tufted pile height is 1-1/2".
 - 4. Total fabric weight shall be at least 88 ounces per square yard.
 - 5. The finished product should also include perforations to ensure drainage greater than 30 inches per hour. Non-perforated systems should not be acceptable alternates for purposes of this specification.

- D. The turf should be delivered in 15' wide rolls.
- E. All lines, numbers and markings indicated on plans should be permanently inlaid. Painted lines should not be an acceptable alternative for purposes of this specification.
- F. The fiber should be green in color to simulate natural grass as closely as possible and treated with UV inhibitor, guaranteed a minimum of eight years.
- G. The infill system should be an a non-expansive engineered coated, clean, dust free and specially sized silicon dioxide beads.
- H. Latex backed turf shall not be acceptable. All adhesives must also be latex free.

PART 3 – EXECUTION

3.1 SITE PREPARATION AND BASE

- A. The sub-base will have a slope per plan.
- B. The base aggregate should consist of a minimum of four inches (4") of $\frac{3}{4}$ " Class 2 aggregate compacted to 95% and four inches (4") of $\frac{3}{4}$ " Class 2 permeable aggregate base compacted to between 90%-95%.
- C. The sub base should be installed in two inch (2") lifts to appropriate thickness.
- D. The sub-base should be compacted using vibrating tamper, to approximately 95% Proctor density.
- E. The sub-base should no longer have any vegetation.
- F. Subgrade prior to aggregate installation: Sublevel grade is to be compacted prior to the ABC aggregate installation. Particular attention should be paid to areas of disturbed earth such as where footers for playground equipment enter the ground. Concrete used to fill said areas/footers should be poured to the top of sublevel surface.
- G. The sub-base installer and architect will accept the aggregate base in writing prior to the installation of the poured in place system.
- H. Any alterations must be agreed between all parties.

3.2 INSTALLATION

The synthetic turf safety surfacing installer should strictly adhere to the installation procedures outlined under these sections. Any variance from these requirements should be accepted in writing by the manufacturer's onsite representative and submitted to the architect/owner, verifying that the changes do not in any way affect the warranty.

A. Cushion Layer

1. The components of the poured in place safety surfacing should be mixed on site in a mixer to ensure a comprehensive mix according to manufacturer's instructions.
2. The cushion layer comprised of SBR buffings shall be mixed with the aromatic moisture cured polyurethane binder at a rate of 12% of the total weight of the material thoroughly so that the binder is evenly dispersed into the rubber base.
3. The cushion layer comprised of non-tire derived SBR & EPDM Chunk Rubber shall be mixed with the appropriate amount of urethane so that the binder is evenly dispersed into the rubber base.
4. The cushion layer mix should then be spread and troweled to the desired depth and allow to cure for 24 hours.

B. Synthetic Turf Layer

1. The synthetic grass should be cut and laid out across the area, and utilizing standard state-of-the-art gluing procedures, each roll should be seamed to the next.
2. The edge of the synthetic turf should be stapled or nailed to header/anchor board.
3. A strip of seam tape should be used to seam the rolls of material. The specified glue should be a one part urethane adhesive (SeamTight).

C. Infill

1. The infill material shall be spread evenly, at a rate of 2 lbs per square foot with a large fertilizer type spreader. The infill will be spread in strict accordance with the turf installer's specifications.
2. Between each application of infill, the field area should be brushed with a motorized rotary nylon broom.
3. Caution: Too much fiber exposed (not enough infill) will cause the fibers to mat or crush with heavy foot traffic. This will lead to premature wearing of the fiber and will void any manufacturer's warranty. No Crumb Rubber shall be used as infill.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Gates and gate hardware.

1.2 RELATED REQUIREMENTS

- A. Section 01 6116, Volatile Organic Compound (VOC) Restrictions, for VOC limits pertaining to adhesives, sealants, fillers, primers, and coatings.
- B. Section 01 8113, Sustainable Design Requirements, for CAL-Green general requirements and procedures.
- C. Section 32 1600, Site Concrete.
- D. Section 08 7100, Door Hardware, for padlocks.

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CAL Green), edition as noted on the drawings, as adopted by the California Division of the State Architect (DSA).
- C. Chain Link Fence Manufacturers' Institute (CLFMI):
 - 1. Products Manual.
- D. ASTM International (ASTM):
 - 1. A153: Zinc Coating (Hot Dip) on Iron and Steel Products.
 - 2. A392: Zinc Coated Steel Chain Link Fence Fabric.
 - 3. A653/A653M: Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
 - 4. A780/A 780M: Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings.
 - 5. C33/C33M: Standard Specification for Concrete Aggregates.
 - 6. C94: Ready-mixed Concrete.
 - 7. C150/C150M: Standard Specification for Portland Cement.
 - 8. F668: Poly Vinyl Chloride (PVC) Coated Steel Chain Link Fence Fabric.
 - 9. F934: Standard Colors for Poly Vinyl Chloride (PVC) Coated Chain Link.
 - 10. F969: Standard Practice for Construction of Chain-Link Tennis Court Fence.
 - 11. F1083: Pipe, Steel, Hot-Dipped Zinc Coated (Galvanized) Welded, for Fence Structures.

CHAIN LINK FENCES AND GATES
SECTION 32 3113
3595001

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Submittal Procedures:
 - 1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
 - 2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
 - 3. Sustainable Design Submittals shall comply with the additional requirement of Section 01 8113, Sustainable Design Requirements.

1.5 ACTION SUBMITTALS

- A. Shop Drawings: Submit showing all parts, connections and anchorages, adjacent materials, fully dimensioned and noted. Indicate plan layout, spacing of components, post foundation dimensions, hardware anchorage and schedule of components.
- B. Products Data: Submit list and complete descriptive data of all products proposed for use. Include manufacturer's specifications, published warranty or guarantee, installation instructions, and maintenance instructions.
- C. Samples:
 - 1. Chain-link fabric, approximately 12 inches square, in selected color.
 - 2. Hardware and fittings if requested by Architect.

1.6 INFORMATIONAL SUBMITTALS

- A. Sample of manufacturer's warranty.
- B. Sustainable Design:
 - 1. General:
 - a. Submit information necessary to establish and document compliance with the California Green Building Standards Code.
 - b. Sustainable design submittals are in addition to other submittals.
 - 2. The following information shall be provided:
 - a. Paints and Coatings: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.

1.7 CLOSEOUT SUBMITTALS

- A. Warranty/Guarantee: Submit executed warranty and Subcontractor's guarantee.

1.8 QUALITY ASSURANCE

- A. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.
- B. Use materials and products of one manufacturer whenever possible.

- C. All materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.

1.9 DELIVERY, STORAGE AND HANDLING

- A. Deliver undamaged products to job in manufacturer's sealed containers and/or original bundles with tags and labels intact.
- B. Store materials in protected, dry conditions off of ground and in areas so as to not interfere with the progress of the work.
- C. Transport, store and handle in strict accord with the manufacturer's written recommendations.

1.10 FIELD CONDITIONS

- A. Make and be responsible for all field dimensions necessary for proper fitting and completion of work. Report discrepancies to Architect before proceeding.

1.11 WARRANTY

- A. Manufacturer: In addition to the Contractor's and Subcontractor's Guarantee, furnish Owner with manufacturer's fully executed written warranty for chain link fencing against defects in materials and workmanship, including the following:
 - 1. Windscreen: 3 years.

PART 2 - PRODUCTS

2.1 DESIGN AND PERFORMANCE CRITERIA

- A. Industry Standards: Materials and installation shall conform to the requirements of the Chain Link Fence Manufacturers Institute (CLFMI) "Product Manual."
- B. Regulatory Requirements: Pedestrian gates and related hardware shall comply with applicable codes, including provisions for accessibility required by CBC and the Americans with Disabilities Act "Designs for Accessible Design." Comply with the most stringent.
- C. Use new components **[except existing fence indicated to be relocated,]** free from defects affecting service and appearance.
- D. Sizes specified or shown are minimum.
- E. Provide ferrous material except as otherwise indicated or specified.
- F. Sustainable Design:
 - 1. VOC emissions for field-applied paints and coatings must comply with limits specified in Section 01 6116.

CHAIN LINK FENCES AND GATES

SECTION 32 3113

3595001

2.2 WORKMANSHIP

- A. Galvanizing: Hot dip galvanize ferrous materials after fabrication. Repair zinc coating damaged in shop or during field erection by re-coating with hot repair compound, Re Galv, Galvalloy, Galvieweld-alloy, or equal, applied in accord with manufacturer's recommendations.

2.3 MATERIALS

- A. Vinyl Coated Chain Link Fabric: Steel wire with no less than 1.20 ounce of zinc coating per square foot of surface area, covered with color coating of polyvinyl chloride no less than 15 mils thick fusion method with breaking strength of 1200 pounds (Class 2b), and complying with ASTM F668.
 - 1. Typical:
 - a. Wire Diameter: 9 gage, coated size.
 - b. Mesh Opening: 2 inches.
 - 2. Edges: Knuckle fabric at bottom and at top selvage.
 - 3. Fabric widths shall be one piece.
 - 4. Color of PVC Coating: In compliance with ASTM F934 and as selected by Architect.
- B. Security Fabric: 16 gauge galvanized sheet metal in conformance with ASTM A653/A653M, 1.3 pounds per square foot, with round hole perforations; McNichols item number 1431141638 as specified and the basis of design, or equal.
 - 1. Perforations shall be 3/16" holes on a 1/4" stagger.
 - 2. Open Area: 51 percent.
 - 3. Finish: Prime and paint as specified in Section 09 9100, Painting, prior to installation.
- C. Security Fabric U-Edging: 14 gauge. galvanized hot rolled U shaped edging, 1 inch tall face x 3/8 inch opening width; McNichols quality U-Edging, item number 4003801410 as specified and the basis of design, or equal.

2.4 GATES

- A. Frames:
 - 1. Gate Leaves to 6 Feet Wide: 1-5/8 inch outside diameter pipe at 2.27 pounds per linear foot.
 - 2. Provide additional horizontal and vertical pipe or tube as necessary to assure proper gate operation and attachment of fabric and hardware.
- B. Diagonal Bracing: Provide adjustable length 3/8 inch truss rods on non-welded gate frames and welded gate frames where corner rigidity is insufficient to insure no sag.
- C. Fabric: As specified for fence.
- D. Gate Assembly:

1. Weld or assemble gate frame with malleable or pressed steel fittings and rivets to provide rigid connections.
 2. Install fabric with stretcher bars at vertical edges, which may also be used at top and bottom edges.
 3. Securely attach stretcher bars and fabric to frame on all sides at 15 inches on center.
 4. Attach hardware with rivets or by other means which will provide security against removal.
- E. Gate Hardware:
1. Provide the following at Accessible gates:
 - a. Exit Device: Von Duprin CD-PA-AX-99-NL-06-WH
 - b. 1 set hinges: self closing Mammoth hinges.
 - c. 1 each: Rim cylinder 20-057 ICX 626 SCH.
 - d. 2 each: FISC core 23-030 626 SCH.
 - e. 1 each: Mortise cylinder 26-091 ICX XQ11-848 626 SCH
- F. Kick Plates: 10 inches tall x width of gate x 14 gauge minimum, smooth uninterrupted surfaced, galvanized steel.
1. Mount on the bottom edge of gate at the push side. Mount on both sides at two-way swing gates.
 2. Bottom edge of plate shall be not more than 3 inches above the top of the walk.
 3. Plate shall be welded to the fence frame and shall allow the gate to be opened by a wheelchair footrest without creating a trap or hazardous condition.
 4. Provide at pedestrian gates that are within the disabled accessible path of travel

2.5 ADDITIONAL MATERIALS AND COMPONENTS

- A. Galvanizing Repair: Zinc coating damaged in shop or during field erection shall be by re-coated using a hot repair compound; "Regalv" repair stick by Rotometals, San Leandro, CA, or equal, applied in accordance with manufacturer's recommendations.

2.6 RELOCATED EXISTING CHAIN LINK FENCING

- A. Inspect existing chain link fencing fabric indicated to be removed and re-installed in new work.
- B. Supervise removal and re-installation.
- C. Provide new material, including fittings and hardware, as necessary for re-installation, complete as specified for new chain link fencing.
- D. Existing fencing materials indicated to be removed or relocated and which are not re-installed in new work, including footing, will become property of the Contractor and shall be removed from the site.

CHAIN LINK FENCES AND GATES
SECTION 32 3113
3595001

PART 3 - EXECUTION

3.1 INSTALLATION

A. General:

1. Execute work in accord with best trade practice for industrial fence installations.
2. Make welds neat and secure, grind off excess exposed metal.
3. Gates shall move freely without sag.

B. Tension Wire: Provide wire at bottom of fence fabric. Install taut, tying to each post with 6 gauge wire.

C. Fabric: Leave about 1-1/2 inches between ground and bottom barbs.

1. Pull fabric taut and tie to posts, rails and tension wires.
2. Install fabric on security side of fence.
3. Fabric shall remain under tension after pulling force is released.

D. Gates:

1. Install gates plumb, level and secure, with full swing or slide without interference.
2. Install ground set items in substantial concrete mass for adequate anchorage.

E. Tie Wires:

1. Install with one tight turn to hold fabric firmly to frame.
2. Bend ends of wire inward to prevent hazard to persons or apparel.

F. Fasteners:

1. Install nuts for tension band and hardware bolts on side of fence opposite fabric side.
2. Spoil ends of bolts to prevent removal of nuts.

3.2 ADJUSTING

A. Repair exposed zinc coatings damaged in shop or during field erection using specified repair system and in compliance with ASTM A 780,

B. Adjust gated hardware for smooth operation and lubricate where necessary.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Domestic water piping system.
 - 2. Fire protection piping systems.
 - 3. Sewer piping system

1.2 RELATED REQUIREMENTS

- A. Section 01 5000, Temporary Facilities and Controls.
- B. Section 01 6116, Volatile Organic Compound (VOC) Restrictions, for VOC limits pertaining to adhesives, sealants, fillers, primers, and coatings.
- C. Section 01 8113, Sustainable Design Requirements, for CAL-Green [and Collaborative for High Performance Schools (CHPS)] general requirements and procedures.
- D. Section 31 0000, Earthwork.
- E. Section 31 2333, Trenching and Backfilling.
- F. Section 32 1600, Site Concrete.

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CAL Green), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- C. California Plumbing Code, (CPC), edition as noted on the Drawings.
- D. California State Health and Safety Code Section 116875, Lead Free Public Water Systems.
- E. Local Jurisdiction: Any work within the street, highway or right-of-way shall be performed in accordance with the requirement of the governmental agencies having jurisdiction, and shall not begin until all of those governing authorities have been notified.
- F. ASTM International (ASTM):
 - 1. D422-63: Test Method for Particle Size Analysis of Soil.
 - 2. D698-00: Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures, Using 5.5 lb (2.49 Kg) Rammer and 12 inch (304.8 mm) Drop.

3. D1556-00: Test Method for Density of Soil in Place by the Sand-Cone Method.
4. D1557-02: Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 10 lb. (4.54 Kg) Rammer and 18 inch (457 mm) Drop.
5. D3017-05: Test Methods for Moisture Content of Soils and Soil-Aggregate Mixture by Nuclear Methods (Shallow Depth).
6. D4318-05: Test Method for Liquid Limit, Plastic Limit, and Plasticity Limit.

G. CALTRANS Standard Specifications.

H. CAL-OSHA, Title 8, Section 1590 (e).

I. NFPA 13, 24 and 25, per CFC chapter 80 and CBC chapter 35.

1.4 ADMINISTRATIVE REQUIREMENTS

A. Submittal Procedures:

1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
3. Sustainable Design Submittals shall comply with the additional requirements of Section 01 8113, Sustainable Design Requirements.

1.5 ACTION SUBMITTALS

- A. Provide supplier's descriptive literature for all products to demonstrate compliance with specified attributes.
- B. Substitution: Provide all data of proposed material being submitted as a substitution. Provide comparison with specified product data and identify all differences. Failure to provide comparison will be reason for rejection.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For contractor / installer.
- B. Provide sieve analysis from accredited testing lab on pipe bedding material. Analysis shall have a current date not older than project contract signing date.
- C. Sustainable Design:
1. General:
 - a. Submit information necessary to establish and document compliance with the California Green Building Standards Code.
 - b. Sustainable design submittals are in addition to other submittals.
 2. The following information shall be provided:
 - a. Adhesives and Sealants: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.

- b. Paints and Coatings: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.

1.7 CLOSEOUT SUBMITTALS

- A. Guarantee: Submit subcontractor's guarantee.
- B. Water Sterilization Test Report.

1.8 QUALITY ASSURANCE

- A. Contractor / Installer shall have been in business for five (5) years providing/finishing similar size projects and complexity.
- B. Contractor shall be solely responsible for all subgrades built. Any repairs resulting from inadequate compaction or incorrect grades will be the responsibility of the contractor.
- C. The representatives of the Owner's testing lab will not act as supervisor of construction, nor will they direct construction operations. Neither the presence of the Owner's testing lab representatives nor the testing by the Owner's testing lab shall excuse the contractors or subcontractors for defects or deficiencies discovered in their work during or following completion of the project. Correcting inadequate compaction is the sole responsibility of the contractor.
- D. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the drawings to be salvaged and re-used.
 - 1. Sun damaged or discolored PVC pipe will be rejected.
- E. All materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.

1.9 FEES, PERMITS, AND UTILITY SERVICES

- A. Obtain and pay for permits and service charges required for installation of Work. Arrange for required inspections and secure written approvals from authorities having jurisdiction.
- B. Upon completion of work within right-of-way, provide copies of written final approval to the Architect.

1.10 DELIVERY, STORAGE AND HANDLING

- A. Transport, store and handle in strict accord with the local jurisdiction and manufacturer's written recommendations
- B. Deliver undamaged products to job in manufacturer's sealed containers and/or original bundles with tags and labels intact.

1.11 EXISTING SITE CONDITIONS

- A. Contractor shall acquaint himself with all site conditions. If unknown active utilities are encountered during work, notify Architect promptly for instructions. Failure to notify will make Contractor liable for damage to these utilities arising from Contractor's operations subsequent to discovery of such unknown active utilities.
- B. Existing civil, mechanical and electrical improvements are shown on respective site plans to the extent known. Should the Contractor encounter any deviation between actual conditions and those shown, he is to immediately notify the Architect before continuing work.

1.12 PROTECTION

- A. Adequate protection measures shall be provided to protect workmen and passers-by on and off the site. Adjacent property shall be fully protected throughout the operations. Blasting will not be permitted. Prevent damage to adjoining improvements and properties both above and below grade. Restore such improvements to original condition should damage occur. Replace trees and shrubs outside building area disturbed by operations.
- B. In accordance with generally accepted construction practices, the Contractor shall be solely and completely responsible for working conditions at the job site, including safety of all persons and property during performance of the work. This requirement shall apply continuously and shall not be limited to normal working hours.
- C. Any construction review of the Contractor's performance conducted by the Geotechnical Engineer is not intended to include review of the adequacy of the Contractor's safety measures, in, on, or near the construction site.
- D. Provide shoring, sheeting, sheet piles and or bracing to prevent caving, erosion or gulying of sides of excavation.
- E. Surface Drainage: Provide for surface drainage during period of construction in manner to avoid creating nuisance to adjacent areas. The contractor shall make a reasonable effort on a daily basis to provide pumps and all equipment necessary to keep all excavations and the site free from water during entire progress of work, regardless of cause, source, or nature of water.
- F. Adjacent streets and sidewalks shall be kept free of mud, dirt or similar nuisances resulting from earthwork operations.
- G. The site and adjacent influenced areas shall be watered as required to suppress dust nuisance. Dust control measures shall be in accordance with the local jurisdiction.
- H. Trees: Carefully protect existing trees that are to remain. Provide temporary irrigation as necessary to maintain health of trees.

1.13 SEASONAL LIMITS

- A. No fill material shall be placed, spread or rolled during unfavorable weather conditions. When work is interrupted by rains, fill operations shall not be resumed until field tests indicate that moisture content and density of fill are satisfactory.

1.14 RECORD DRAWINGS

- A. Keep a daily record of all pipe placed in ground, verified by Project Inspector.
- B. Upon completion of this Contract, furnish one tracing showing all outside utility lines, piping, etc., installed under this Contract. Locate and dimension all work with reference to permanent landmarks.
- C. All symbols and designations used in preparing "RECORD" drawings shall match those used in Contract drawings.
- D. Properly identify on as-builts and provide dimensions for all stubs for future connections. Provide concrete markers 6" dia. 12" deep, flush with finish grade at the ends of all stubbed pipes.
- E. Provide record drawings per Section 01 3300.

PART 2 - PRODUCTS

2.1 DESIGN AND PERFORMANCE CRITERIA

- A. Sustainable Design:
 - 1. VOC emissions for field-applied adhesives, sealants, and sealant primers must comply with limits specified in Section 01 6116.
 - 2. VOC emissions for field-applied paints and coatings must comply with limits specified in Section 01 6116.

2.2 MATERIALS - GENERAL

- A. Provide each item listed herein or shown on drawings of quality noted or approved equal. All material shall be new, full weight, standard in all respects and in first-class condition. Insofar as possible, all materials used shall be of same brand or manufacture throughout for each class of material or equipment. Materials shall be of domestic manufacture and shall be tested within Continental United States.
- B. Grade or quality of materials desired is indicated by trade names or catalog numbers stated herein.
- C. Dimensions, sizes, and capacities shown are minimum and shall not be changed without permission of Architect.
- D. All materials in this section used for any public water system or domestic water for human consumption shall be lead free.

1. For the purposes of this section, "lead free" means not more than 0.2 percent lead when used with respect to solder and flux and not more than 8 percent when used with respect to pipes and pipe fittings.
2. All pipe, pipe or plumbing fitting or fixtures, solder, or flux shall be certified by an independent American National Standards Institute (ANSI) accredited third party, including, but not limited to, NSF International, as being in compliance with this section.

E. All materials used for fire system piping shall be UL and FM approved.

2.3 VALVE BOXES

- A. Provide at each valve or cock in ground a Christy, Brooks, or equal to Christy G05CT, concrete valve box with cover marked for service, domestic water shall be marked "Water" and fire supply shall be marked "Fire". Furnish extension handles for each size square nut valve, and provide "fork" handle for each size of "wheel handle" valve as required. Do not locate valve boxes in walk, or covered passages, curbs, or curb & gutters, unless necessary. If valve location is within concrete or asphalt paved surface valve box shall be as detailed on plans for such condition. Provide valve box extensions as required to set bottom of valve box to bottom of piping in which valve is installed. Provide Owner with set of special wrenches and/or tools as required for operation of valves.

2.4 PIPES AND FITTINGS

- A. Sanitary Sewer: PVC sewer pipe and fittings with Ring-Tite joints, ASTM D3034 SDR35.
- B. Domestic water Lines 3 1/2" and smaller: Type K copper tubing, hard temper, with wrought copper fittings. Schedule 80 PVC, ASTM D 1784, ASTM D 1785.
- C. Water lines 4" and larger: AWWA C-900 Class 150/DR18 with rubber gasket joints.
- D. Fire lines 4" and larger: AWWA C-900 Class 200/DR14 with rubber gasket joints.
- E. Solder: Lead Free. 95/5; 95% Tin / 5% Antimony.
- F. Ductile Iron Pipe; AWWA Class 51, Cement Lined
- G. Ductile Iron Pipe Fittings; AWWA C110, C153, Ebba Iron, Star Romac, Sigma, or approved equal.
- H. PVC Mechanical Fittings; Ebba Iron, Star; Romac; Sigma or approved equal.
- I. Ductile Iron Pipe/PVC C-900 Pipe Restrained Fittings; Ebba Iron # 3800 Mega Coupling, Ebba Iron 1100CH Split Restrained Harness for pipe couplings. StarGrip Series 4000.
- J. Ductile Iron Pipe/PVC C900, C905 Restrained Degreedand Blind Cap Fittings,;
- K. Mega Lug; Sigma; Romac; or an approved equal

- L. Mechanical Fitting Bolts; Bolts and nuts shall be carbon steel with a minimum 60,000 psi tensile strength conforming to ASTM A 307, Grade A. Bolts shall be standard ANSI B1.1 Class 2A course threads. Nuts shall conform to ASTM A 563 and be standard ANSI B1.1, Class 2A course thread. All bolts and nuts shall be zinc coated.
- M. Fasteners Anti-Rust Coatings; After assembly, coat all fasteners with an Asphaltic Bituminous coatings conforming to latest edition NFPA 24.
- N. Ductile Iron Pipe Wrap; 8 mil polyethylene pipe wrap conforming to ANSI/AWWA C105/A21.5 standards.
- O. Pipe Insulation; Pipe exposed to atmospheric conditions ½" thru 4" NPT; Johns Manville rigid fiberglass insulation, Micro Lok HP; Owens Corning Fiberglas SSL II; Conforming to ASTM C 612, Type 1A or type 1B.
- P. Aluminum field applied pipe insulation jacket; comply with ASTM B209, ASTM C1729, ASTM C1371 Manufacturers; Childers Metals; ITW Insulation Systems Aluminum Jacketing; or an approved equal.
 - 1. Finish shall be flat mill finish
 - 2. Factory Fabricated Fitting Covers; 45 and 90 degree elbows, tee's, valve covers, end caps, unions, shall be of the same thickness and finish of jacket.
 - 3. The fittings shall be composed of 2-pieces
 - 4. Adhesives; per the manufacturers requirements
 - 5. Joint Sealant; shall be silicone, and shall be aluminum in color.
- Q. Sewer Forced Main; HDPE, DR 11, color gray with green stripe by JM Eagle or approved equal.

2.5 SANITARY SEWER MANHOLES

- A. Shall be constructed as shown on plan details.

2.6 CLEANOUTS

- A. Cleanouts of same diameter as pipe up to 8" in size shall be installed in all horizontal soil and waste lines where indicated and at all points of change in direction. Cleanouts shall be located not less than 18" from building so as to provide sufficient space for rodding. No horizontal run over 100 feet shall be without cleanout whether shown on drawings or not.
- B. All cleanout boxes shall be traffic rated with labeled lid, Christy G05CT or approved equal. Lid shall be vandal proof with stainless steel screws

2.7 UNIONS

- A. Furnish and install one union at each threaded or soldered connection to equipment and 2 unions, one on each side of valves on pipes ½" to 3".

- B. Locate unions so that piping can be easily disconnected for removal of equipment or valve. Provide type specified in following schedule:

Type of Pipe Union

Steel Pipe: 150 lb. Screwed malleable ground joint, brass, brass-to-iron seat, black or galvanized to match pipe.

Copper tubing: Brass ground joint with sweat connections.

PVC Sch 80 pipe: PVC union, FIPT X FIPT

2.8 VALVES

- A. Provide valves as shown and other valves necessary to segregate branches or units. Furnish valves suitable for service intended. Valves shall be properly packed and lubricated. Valves shall be non-rising stem. Place unions adjacent to each threaded or sweat fitting valve. Install valves with bonnets vertical. All valves shall be lead free.
- B. Valves ½" thru 2"; shall be made of bronze, full size of pipe and lead free. Nibco S-113-FL Series; American G-300 Series; Matco 511 FL Series; Apollo 102T-FL Series. Brass valves of brass parts within valves will not be accepted.
- C. Valves, 2 ½" thru 3" shall be class 150; Shall be made of bronze, full size of pipe; Jenkins Fig. 2310 J; Lunkinheimer Fig. 2153; Crane Fig. 437; Stockham Fig. B-128.
- D. Valves, Flanged; 4" thru 12" Ductile Iron Resilient Wedge Gate Valve; Nibco F 609 RW; American 2500 Series; Kennedy 8561; Mueller 2360 Series.

2.9 TAPPING SLEEVE

- A. Shall be used on pipe sizes 6" thru 12" and shall be made with stainless steel material including stainless steel bolts. Flanges shall be ductile iron or high carbon steel. Gaskets shall seal full circumference of pipe. Shall be manufactured for operating pressure of 200 psi, and shall pass test pressure of 300 psi. Romac SST series; Smithblair 662; Mueller H304; Ford "FAST" tapping sleeve.

2.10 SERVICE SADDLES

- A. Shall be used on pipe size 2" thru 4". Body shall be made from ductile iron with epoxy coating or bronze. Cascade Style CSC-1; A.Y. McDonald model 3891 AWWA/3892 FNPT; Smith-Blair #317; Ford S70, S71, S90, (style B).

2.11 TRACER WIRE

- A. No. 10 THW solid copper wire. Solder all joints

PART 3 - EXECUTION

3.1 DRAWINGS AND COORDINATION

- A. General arrangement and location of piping, etc., are shown on Drawings or herein specified. Install work in accord therewith, except for minor changes that may be necessary on account of other work or existing conditions. Before excavation, carefully examine other work that may conflict with this work. Install this work in harmony with other craft and at proper time to avoid delay of work.
- B. Verify invert elevations at points of connection to existing systems prior to any excavation. If invert elevations differ from that shown on drawings, notify Architect immediately.
- C. In advance of construction, work out minor changes if conflicts occur with electrical or mechanical. Relocate services to suit actual conditions and work of other trades to avoid conflict therewith. Any adjustments or additional fittings to make adjustments shall not be cause for additional costs to the owner.
- D. Execute any work or apparatus shown on drawings and not mentioned in specifications, or vice versa. Omission from Drawings or Specifications of any minor details of construction, installation, materials, or essential specialties does not relieve Contractor of furnishing same in place complete.
- E. Graded pipes shall take precedence. If conflict should occur while placing the domestic water and fire service piping, the contractor shall provide any and all fittings necessary to route the water lines over such conflicting pipes at no additional costs to the owner.

3.2 ACCESS

- A. Continuously check for clearance and accessibility of equipment or materials specified herein to be placed. No allowance of any kind shall be made for negligence on part of Contractor to foresee means of installing his equipment or materials into proper position.

3.3 EXCAVATING AND BACKFILLING

- A. Excavation and Bedding:
 - 1. General: Trench straight and true to line and grade with bottom smooth and free of irregularities or rock points. Trench width to be a minimum of 12" wider than outside diameter of pipe. Follow manufacturer's recommendations for use of each kind and type of pipe.
 - 2. Bedding: Provide a bedding as noted on drawing details for the full length of the pipe. Bedding shall have a minimum thickness beneath the pipe of 4" or 1/8 the outside diameter of the pipe, which ever is greater. Provide bell holes and depressions for pipe joints only of size required to properly make joint.
 - 3. If the trenches for the site utilities falls within areas to be lime treated, the piping shall be installed prior to any lime treatment operations, providing the elevation of the piping is below the treatment section.

UTILITIES
SECTION 33 0000
3595001

- a. If trenching is necessary in areas that have been previously lime treated the contractor shall backfill the trench with class 2 aggregate base, with minimum section equal to the lime treated section and compacted to 95%.

B. Laying of Pipe:

- 1. General: Inspect pipe prior to placing. Sun damaged pipe will be rejected. Set aside any defective or damaged material. Do not place pipe in water nor place pipe when trenches or weather are unsuitable. Lay pipe bell up grade, true to line and grade.
 - a. Sewer pipe shall be laid in strict conformity to the prescribed line and grade, with grade bars set and each pipe length checked to the grade line. Three consecutive points on the same rate of slope shall be used at all times to detect any variation from a straight grade. In any case of discrepancy, work shall be stopped and the discrepancy immediately reported to the Owner's Representatives. In addition, when requested by the Owner's Representative, a string line shall be used in the bottom of the trench to insure a straight alignment of the sewer pipe between manholes. The maximum deviation from grade shall not be in excess of 1/4 inch. In returning the pipe to grade, no more than 1/4" depression shall result.
 - b. The Contractor shall expose the end of existing pipe to be extended, for verification of alignment and elevation, prior to trenching for any pipe which may be affected. All costs of such excavation and backfill shall be included in the price paid for the various items of work.
 - c. A temporary plug, mechanical type shall be installed on sewer pipe at the point of connection to existing facilities. If connecting to a public facility the plug shall conform to the requirements of the local jurisdiction. This plug shall remain in place until the completion of the balling and flushing operation.
- 2. Bell and Spigot Joints: Lubricate inside of bells and outside of spigots with soap solution. Wedge joints tight. Bell of bell and spigot pipe to be pointed up grade.

C. Backfilling:

- 1. General: Do not start backfill operations until required testing has been accomplished.
- 2. Compaction and Grading: Remainder of backfill shall be in accordance with Section 31 2333 – TRENCHING AND BACKFILLING.
- 3. If trenching in area previously lime or cement treated backfill top of trench section, same depth as lime or cement treatment with Class 2 Aggregate Base compacted to 95% minimum relative compaction.

3.4 INSTALLATION OF WATER PIPING

- A. Immediately cap or plug ends of, and opening in, pipe and fittings to exclude dirt until final connections made. Use reducing fittings where any change in pipe size occurs. Bushings shall not be used.

- B. General: Should existing conditions or other work prevent the running of pipes or the setting of equipment at the points indicated by drawings, changes as authorized by the Architect shall be made without additional cost to the Owner.
- C. All bolts used on mechanical fittings shall be thoroughly coated with an asphaltic bituminous coating conforming to 2007 NFPA (National Fire Protection Association) 10.3.5.2 and 10.8.3.5, CBC chapter 35 and CFC chapter 80.
- D. All buried metal shall be incased with 8 mil polyethylene wrap so that no soil is in contact with metal. Ends of polyethylene wrap shall be taped to provide seal with pipe.
- E. Do not install water lines in same trench with non-metallic sewer lines unless bottom of water pipe at all points is at least 12" above top of sewer line and water line is placed on solid shelf excavated at one side of common trench with a minimum of 12 inch horizontal separation.
- F. Under no circumstance shall a fitting be located directly under a structural footing without prior approval from the Architect.
- G. In locations where existing domestic pipe is rerouted, the new pipe shall be assembled using restrained fittings at all joints including factory pipe joints. Tapped restrained blind flanges shall be temporarily installed at each end of the assembled pipes until testing and chlorination is completed and approved.

3.5 CLOSING IN OF UNINSPECTED WORK

- A. Do not allow or cause work installed to be covered up or enclosed before it has been inspected, tested, and approved. Should work be enclosed or covered up before it has been approved, uncover work at own expense. After it has been inspected, tested and approved, make repairs necessary to restore work of other contractors to condition in which it was found at time of cutting.

3.6 CARE AND CLEANING

- A. Repair or replace broken, damaged, or otherwise defective parts, materials, and work. Leave entire work in new condition satisfactory to Architect. At completion, carefully clean and adjust equipment, fixtures and trim that are installed as part of this work. Leave systems and equipment in satisfactory new operating condition.
- B. Drain and flush piping to remove grease and foreign matter.
- C. Sewer piping shall be balled and flushed.
- D. Clean out and remove surplus materials and debris resulting from the work, including surplus excavated material.
- E. Flush fire service piping in the presence of the project inspector. Flushing shall be continued for a sufficient time as necessary to ensure all foreign material has been removed. Flow rate shall be equal to site fire flow requirements.

3.7 SEWER INTERNAL INSPECTIONS

- A. Upon completion of construction and prior to final inspection, the Contractor shall clean the entire new pipeline of all dirt and debris. Any dirt or debris in previously existing pipes or ditches in the area, which resulted from the new installation, shall also be removed. Pipes shall be cleaned by the controlled balling and flushing method. Temporary plugs shall be installed and maintained during cleaning operations at points of connection to existing facilities to prevent water, dirt, and debris from entering the existing facility.

3.8 TEST OF PIPING

- A. Pressure Test piping at completion of roughing-in, in accord with following schedule, and show no loss in pressure or visible leaks after minimum duration or four (4) hours at test pressures indicated.
- B. Chlorination tests shall be performed after all fixtures and any required mechanical devices are installed and the entire system is complete and closed up.
- C. In cases where new domestic water piping is assembled for re-routing of existing domestic water pipe, the contractor shall perform the following testing prior to connecting the new water pipe to the existing system.
 - 1. The pipe shall be pressure tested and per the test schedule.
 - 2. The pipe shall be pressure tested down within the trench.
 - 3. The contractor shall dig a temporary ditch below the existing pipe to drain to a sump that is lower than the bottom of the trench and to the side of the trench. The sump shall be 30% larger than the total volume of water within the testing pipe assembly.
 - 4. After pressure testing and chlorination has taken place and accepted, the contractor shall drain the pipe into the sump and pump the sump out as it is filling.
 - 5. The temporary test fittings at each end of the pipe assembly shall be removed and the final restrained couplings installed.
 - 6. The existing piping shall be cut and the water within the pipe shall drain below the pipe to the temporary sump. Pump the sump as it is being filled up. Take extreme caution not to contaminate the existing pipe with any contaminants within the trench.
 - 7. Before making the final coupling connections, the restrained couplings at each end of the new pipe shall be thoroughly swabbed inside the fitting with a solution of chlorine mixed with water at a rate of 1 part chlorine to 4 parts potable water.
 - 8. After final connections are made, a visual inspection shall be made after fittings are wiped off. If after 1 hr, no noticeable drips are noted the pipe can be backfilled.
 - 9. The contractor shall flush all water piping affected by chlorination until it is within acceptable levels approved by certified testing lab.

TEST SCHEDULE

<u>System Tested</u>	<u>Test Pressure PSIG Test With</u>
Public Water Mains	Per local jurisdiction requirements.
Private Domestic Water Piping:	150 Lbs. Water 4 hrs.
Fire Protection Piping:	200 Lbs. Water pressure, 4 hrs duration with no pressure loss.
Sanitary Sewer Piping:	Sewer system shall be tested for leakage per local jurisdiction requirements.

- D. Testing equipment, materials, and labor shall be furnished by contractor.

3.9 WATER SYSTEM STERILIZATION

- A. Public Water Mains: Shall be flushed and disinfected per the local jurisdiction requirements
- B. Clean and disinfect all site water systems connected to the domestic water systems in accordance with AWWA Standard C651 and as required by the local Building and Health Department Codes, and EPA.
 - 1. Clean and disinfect industrial water system in addition to the domestic water system.
 - 2. Disinfect existing piping systems as required to provide continuous disinfection upstream to existing valves. At Contractors option, valves may be provided to isolate the existing piping system from the new piping system.
- C. Domestic water sterilization shall be performed by a licensed "qualified applicator" as required by CAL-EPA Pesticide Enforcement Branch for disinfecting and sterilizing drinking water.
- D. Disinfecting Agent: Chlorine product that is a registered product with Cal-EPA for use in California potable water lines, such as Bacticide, CAL-EPA Registration No. 37982-20001.
- E. Contractor to provide a 1" service valve connected to the system at a point within 2'-0" of its junction with the water supply line. After sterilization is complete Contractor to provide cap at valve.
- F. Sterilization Procedure to be as follows:
 - 1. Flush pipe system by opening all outlets and letting water flow through the system until clear water flows from all outlets.

UTILITIES
SECTION 33 0000
3595001

2. Inject disinfecting agent to provide a minimum chlorine residual concentration of at least 50 parts per million (ppm) of free chlorine at each outlet.
 3. Provide sign at all outlets which reads "Water Sterilization in Progress – Do not operate". Remove signs at conclusion of test.
 4. Close all outlets and valves, including valve connecting to water supply line and 1" service valve. Retain treated water in pipe for a minimum of twenty-four hours. Should chlorine residual at pipe extremities be less than 50 PPM at this time, pipe shall be re-chlorinated. As an option, the water systems may be filled with a water-chlorine solution containing a minimum of 200 PPM of chlorine and allowed to stand for three hours.
 5. After chlorination, flush lines of chlorinated water and refill from domestic supply. Continue flushing until residual chlorine is less than or equal to 0.2 ppm, or a residual the same as that of the test water.
- G. Chemical and bacteriological tests shall be conducted by a state-certified laboratory and approved by the local authorities having jurisdiction.
- H. Submit written report to Health Department as required by State Regulations. Provide a copy of report to Architect prior to completion of project.
- I. The costs of sterilization and laboratory testing shall be paid for by the contractor.

3.10 CLEANING

- A. Upon completion of work of this Section promptly remove from the working area all scraps, debris and surplus material of this Section.

END OF SECTION

s:\master specifications\division 33 - utilities\33 0000_utilities.docx
Formatting Updated: 9-13-21

PART 1 - GENERAL

1.1 SUMMARY

- A. Summary Includes:
 - 1. Storm drainage piping systems.

1.2 RELATED REQUIREMENTS

- A. Section 01 5000, Construction Facilities and Controls.
- B. Section 01 6116, Volatile Organic Compound (VOC) Restrictions, for VOC limits pertaining to adhesives, sealants, fillers, primers, and coatings.
- C. Section 01 8113, Sustainable Design Requirements, for CAL-Green **[and Collaborative for High Performance Schools (CHPS)]** general requirements and procedures.
- D. Section 31 0000, Earthwork.
- E. Section 31 2333, Trenching and Backfilling.
- F. Section 32 1200, Asphalt Concrete Paving.
- G. Section 32 1600, Site Concrete

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CAL Green), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- C. California Plumbing Code, (CPC), edition as noted on the Drawings.
- D. Local Jurisdiction: Any work within the street, highway or right-of-way shall be performed in accordance with the requirement of the governmental agencies having jurisdiction, and shall not begin until all of those governing authorities have been notified.
- E. ASTM International (ASTM):
 - 1. D 422-63 Test Method for Particle Size Analysis of Soil.
 - 2. D698-00 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures, Using 5.5 lb (2.49 Kg) Rammer and 12 inch (304.8 mm) Drop.
 - 3. D1556-00 - Test Method for Density of Soil in Place by the Sand-Cone Method.
 - 4. D1557-02 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 10 lb. (4.54 Kg) Rammer and 18 inch (457 mm) Drop.

STORM DRAINAGE UTILITIES
SECTION 33 4000
3595001

5. D 3017-05 Test Methods for Moisture Content of Soils and Soil-Aggregate Mixture by Nuclear Methods (Shallow Depth).
6. D 4318-05 Test Method for Liquid Limit, Plastic Limit, and Plasticity Limit.

F. CALTRANS Standard Specifications.

G. CAL-OSHA, Title 8, Section 1590 (e).

1.4 ADMINISTRATIVE REQUIREMENTS

A. Submittal Procedures:

1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
3. Sustainable Design Submittals shall comply with the additional requirements of Section 01 8113, Sustainable Design Requirements.

1.5 ACTION SUBMITTALS

- A. Provide supplier's descriptive literature for all products to demonstrate compliance with specified attributes.
- B. Substitution: Provide all data of proposed material being submitted as a substitution. Provide comparison with specified product data and identify all differences. Failure to provide comparison will be reason for rejection.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: Contractor / installer.
- B. Provide sieve analysis from accredited testing lab on pipe bedding material. Analysis shall have a current date not older than project contract signing date.
- C. Sustainable Design:
1. General:
 - a. Submit information necessary to establish and document compliance with the California Green Building Standards Code.
 - b. Sustainable design submittals are in addition to other submittals.
 2. The following information shall be provided:
 - a. Adhesives and Sealants: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.
 - b. Paints and Coatings: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.

1.7 CLOSEOUT SUBMITTALS

- A. Guarantee: Submit subcontractor's guarantee.

1.8 QUALITY ASSURANCE

- A. Contractor / Installer shall have been in business for five (5) years providing/finishing similar size projects and complexity.
- B. Contractor shall be solely responsible for all subgrades built. Any repairs resulting from inadequate compaction are the responsibility of the contractor.
- C. The representatives of the Owner's testing lab will not act as supervisor of construction, nor will they direct construction operations. Neither the presence of the Owner's testing lab representatives nor the testing by the Owner's testing lab shall excuse the contractors or subcontractors for defects discovered in their work during or following completion of the project. Correcting inadequate compaction is the sole responsibility of the contractor.
- D. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.
 - 1. Sun damaged or discolored PVC pipe will be rejected.
- E. All materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.

1.9 DELIVERY, STORAGE AND HANDLING

- A. Transport, store and handle in strict accord with the local jurisdiction and manufacturer's written recommendations
- B. Deliver undamaged products to job in manufacturer's sealed containers and/or original bundles with tags and labels intact.

1.10 EXISTING SITE CONDITIONS

- A. Contractor shall acquaint himself with all site conditions. If unknown active utilities are encountered during work, notify Architect promptly for instructions. Failure to notify will make Contractor liable for damage to these utilities arising from Contractor's operations subsequent to discovery of such unknown active utilities.
- B. Existing civil, mechanical and electrical improvements are shown on respective site plans to the extent known. Should the Contractor encounter any deviation between actual conditions and those shown, he is to immediately notify the Architect before continuing work.

1.11 PROTECTION

- A. Adequate protection measures shall be provided to protect workmen and passers-by on and off the site. Adjacent property shall be fully protected throughout the operations.

STORM DRAINAGE UTILITIES
SECTION 33 4000
3595001

Blasting will not be permitted. Prevent damage to adjoining improvements and properties both above and below grade. Restore such improvements to original condition should damage occur. Replace trees and shrubs outside building area disturbed by operations.

- B. In accordance with generally accepted construction practices, the Contractor shall be solely and completely responsible for working conditions at the job site, including safety of all persons and property during performance of the work. This requirement shall apply continuously and shall not be limited to normal working hours.
- C. Any construction review of the Contractor's performance conducted by the Geotechnical Engineer is not intended to include review of the adequacy of the Contractor's safety measures, in, on, or near the construction site.
- D. Provide shoring, sheeting, sheet piles and/or bracing to prevent caving, erosion or gullyng of sides of excavation.
- E. Surface Drainage: Provide for surface drainage during period of construction in manner to avoid creating nuisance to adjacent areas. The contractor shall make a reasonable effort on a daily basis to provide pumps and all equipment necessary to keep all excavations and the site free from water during entire progress of work, regardless of cause, source, or nature of water.
- F. Adjacent streets and sidewalks shall be kept free of mud, dirt or similar nuisances resulting from earthwork operations.
- G. The site and adjacent influenced areas shall be watered as required to suppress dust nuisance. Dust control measures shall be in accordance with the local jurisdiction.
- H. Trees: Carefully protect existing trees that are to remain.

1.12 SEASONAL LIMITS

- A. No fill material shall be placed, spread or rolled during unfavorable weather conditions. When work is interrupted by rains, fill operations shall not be resumed until field tests indicate that moisture content and density of fill are satisfactory.

1.13 TESTING

- A. General: Refer to Section 01 4523 – Testing and Inspection Services, and Structural Tests and Inspections List, DSA-103.
- B. Geotechnical Engineer: Owner is retaining a Geotechnical Engineer to determine compliance of fill with Specifications, and to direct adjustments in fill operations. Costs of Geotechnical Engineer will be borne by Owner; except those costs incurred for re-tests or re-inspection will be paid by Owner and backcharged to Contractor.

1.14 RECORD DRAWINGS

- A. Keep a daily record of all pipe placed in ground, verified by Project Inspector.

STORM DRAINAGE UTILITIES
SECTION 33 4000
3595001

- B. Upon completion of this Contract, furnish one tracing showing all outside utility lines, piping, etc., installed under this Contract. Locate and dimension all work with reference to permanent landmarks.
- C. All symbols and designations used in preparing "RECORD" drawings shall match those used in Contract drawings.
- D. Properly identify all stubs for future connections, as to location and use, by setting of concrete marker at finished grade in the manner suitable to Architect.

PART 2 - PRODUCTS

2.1 DESIGN AND PERFORMANCE CRITERIA

- A. Sustainable Design:
 - 1. VOC emissions for field-applied adhesives, sealants, and sealant primers must comply with limits specified in Section 01 6116.
 - 2. VOC emissions for field-applied paints and coatings must comply with limits specified in Section 01 6116.

2.2 MATERIALS

- A. Pipe: Use one of the following, unless noted on the Drawings otherwise.
 - 1. Polyvinyl Chloride Pipe (PVC): SDR35 conforming to ASTM D3034 with elastomeric joints conforming to ASTM D3212 for pipe to 12". Sun damaged pipe will be rejected.
 - 2. High density polyethylene pipe (HDPE): The pipe shall be corrugated exterior/smooth interior pipe. 12" to 60" maximum diameter shall conform to AASHTO M294, water tight per ASTM D3212 with water tight gasket fittings.
- B. Perforated Pipe (for subdrains): Shall be ADS N12 pipe, 3 hole, ASTM F 405, AASHTO M 252; PCV ASTM D3034 SDR-35 storm drain pipe
- C. Manhole: Shall be as shown on the drawing details.
- D. Drop Inlet: Shall be as shown on the drawing details.
- E. Curb Inlet: Shall be as shown on the drawing details.
- F. Mortar: For pipe connections to concrete drainage structures, conform to ASTM C270 type N mortar. Place within one half hour after adding water.
- G. Crushed Rock: Imported washed crushed rock. Minimum 100% passing 3/4 inch sieve.
- H. Trench drain: Polycast, Polydrain or equal and as shown on drawings.
- I. Area Drains: Shall be as shown on the drawing details.

STORM DRAINAGE UTILITIES
SECTION 33 4000
3595001

- J. Floor Drains: Shall be as shown on the drawing details.
- K. Clean-outs: Shall be as shown on the drawing details.
- L. Planter drains: Shall be as detailed on the drawing details.
- M. Filter Fabric: Mirafi 140N.

PART 3 - EXECUTION

3.1 INSPECTION LAYOUT AND PREPARATION

- A. Prior to installation of the work of this Section, carefully inspect and verify by field measurements that installed work of all other trades is complete to the point where this installation may properly commence
- B. Layout all work, establish grades, locate existing underground utilities, set markers and stakes, setup and maintain barricades and protection facilities; all prior to beginning actual earthwork operations. Layout and staking shall be done by a licensed Land Surveyor or Professional Civil Engineer.
- C. Verify that specified items may be installed in accordance with the approved design.
- D. In event of discrepancy, immediately notify Owner and the Architect. Do not proceed in discrepant areas until discrepancies have been fully resolved.

3.2 EXCAVATION AND BACKFILLING

- A. General: Installation shall be in strict conformance with referenced standards, the manufacturer's written directions, as shown on the drawings and as herein specified.
- B. Verify invert elevations at points of connection to existing systems prior to any excavation. If invert elevations differ from that shown on drawings, notify Architect immediately.
- C. Excavation and Bedding:
 - 1. General: Trench straight and true to line and grade with bottom smooth and free of irregularities or rock points. Trench width in accordance with pipe manufacturer's recommendations and as per the drawings. Follow manufacturer's recommendations for use of each kind and type of pipe.
 - 2. Bedding: Provide bedding as detailed on plans for the full length of the pipe. Bedding shall have a minimum thickness beneath the pipe of 4" or 1/8 the outside diameter of the pipe, whichever is greater. Provide bell holes and depressions for pipe joints only of size required to properly make joint.
 - 3. If the trenches for the site drainage fall within areas to be lime treated, the piping shall be installed prior to any lime treatment operations.
 - a. If additional piping is added to previously lime treated areas, the contractor shall backfill the trench with class 2 aggregate base and compact to 95%.

D. Laying of Pipe:

1. General: Inspect pipe prior to placing. Set aside any defective or damaged material. Do not place pipe in water nor place pipe when trenches or weather are unsuitable. Lay pipe upgrade, true to line and grade.
2. Bell and Spigot Joints: Lubricate inside of bells and outside of spigots with soap solution or as recommended by manufacture. Wedge joints tight. Bell of bell and spigot pipe to be pointed upgrade.
3. Pipe shall be bedded uniformly throughout its length.
4. Pipe elevation shall be within 0.02 feet of design elevation as shown on plans.
5. Off Site Work: All work beyond the property lines shall be done in strict conformance with the requirements of the governing agency.

E. Backfilling:

1. General: Do not start backfill operations until required testing has been accomplished.
2. Trenches and Excavations: Backfill with material as detailed on plans, filling both sides of the pipe at the same time, carefully tamping to hold pipe in place without movement. Refer to Section 31 2333 – TRENCHING AND BACKFILLING for fill above this layer.

F. Grouting of Pipes: Grout pipes smooth and water tight at drop inlet, manholes, and curb inlets. Grout back side of hood at curb inlets all grouting shall be smooth and consistent.

G. Off Site Work: All work beyond the property lines shall be done in strict conformance with the requirements of the local agency.

H. Cutting and Patching: Remove and replace existing surface features per applicable specification section (i.e. asphaltic concrete or concrete paving) where pipe is installed in areas of existing improvements.

3.3 TOLERANCES

A. Storm Drain structure grates

1. In landscape and lawn areas $\pm 0.05'$.
2. In sidewalk and asphalt pavement $\pm 0.025'$.
3. In curb and gutter application $\pm 0.0125'$.

B. Cleanout Boxes and Lids

1. In landscape areas; 0.10 higher than surrounding finish grade, $\pm 0.05'$.
2. In sidewalks and asphalt pavement; Flush with surrounding finish grade, $\pm 0.025'$.

3.4 DEWATERING

A. Contractor to provide trench dewatering as necessary, no matter what the source is, at no additional cost to the owner.

STORM DRAINAGE UTILITIES
SECTION 33 4000
3595001

3.5 FLUSHING

- A. The Contractor shall thoroughly ball and flush the storm drain system to remove all dirt and debris. Discharge water to an approved location.

3.6 CLEANING

- A. Upon completion of work of this Section promptly remove from the working area all scraps, debris and surplus material of this Section.
- B. Clean the dirt, rocks, and debris from the drop inlets and storm drain manholes.

END OF SECTION

**George Kelly Elementary School -
Shade Structures**

535 Mabel Josephine Drive, Tracy, CA 95376

3595001

Tracy Unified School District

1875 W Lowell Ave., Tracy, CA 95376

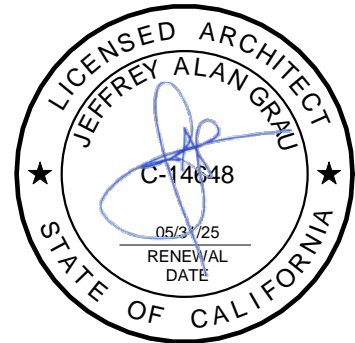


May 16, 2024

George Kelly Elementary School - Shade Structures
Tracy Unified School District
Tracy, California

May 16, 2024

HMC # 3595001



HMC ARCHITECTS
Architect



Warren Consulting Engineers
Civil Engineer

TABLE OF CONTENTS

DIVISION 00 - PROCUREMENT AND CONTRACTING REQUIREMENTS - NOT USED

DIVISION 01 - GENERAL REQUIREMENTS

SECTION	01 1100 - Summary of Work
	01 2100 - Allowance
	01 2513 - Product Options and Substitutions
	01 2600 - Changes in the Work
	01 2900 - Application for Payment and Conditional and Unconditional Waiver and Release Forms
	01 3119 - Project Meetings
	01 3213 - Scheduling of Work
	01 3300 - Submittal (Including Submittal Transmittal, Substitution Request, RFI, Electronic Data Request, Certification of Compliance for Building Materials, Roof Certification)
	01 3513.23 - Site Standards
	01 3516 - Alteration Project Procedures
	01 3543 - Environmental Procedures
	01 4100 - Regulatory Requirements
	01 4213 - Abbreviations and Acronyms
	01 4216 - Definitions
	01 4219 - References
	01 4300 - Materials and Equipment
	01 4500 - Quality Control
	01 4516 - Field Quality Control Procedures
	01 4523 - Testing and Inspection Services
	01 5000 - Temporary Facilities and Controls
	01 5013 - Construction Waste Management and Disposal
	01 5213 - Field Offices
	01 5639 - Temporary Tree Protection
	01 5713.10 - Erosion Control
	01 6116.10 - Volatile Organic Compound (VOC) Restrictions
	01 6600 - Product Delivery Storage and Handling
	01 7123 - Field Engineering
	01 7329 - Cutting and Patching
	01 7419 - Construction Waste Management and Disposal
	01 7419A - Contractor's Construction Waste and Recycling Plan
	01 7419B - Contractor's Reuse, Recycling and Disposal Report
	01 7600 - Alteration Project Procedures
	01 7700 - Contract Closeout and Final Cleaning
	01 7823 - Operation and Maintenance Data
	01 7836 - Warranties (Including Contractor Standard Warranty Form, Subcontractor Standard Warranty Form, Special Extended Warranty Form)
	01 7839 - Record Documents
	01 8113.10 - Sustainable Design Requirements

DIVISION 02 - EXISTING CONDITIONS - NOT USED

DIVISION 03 - CONCRETE - NOT USED

DIVISION 04 - MASONRY - NOT USED

DIVISION 05 - METALS - NOT USED

DIVISION 06 - WOOD, PLASTICS, AND COMPOSITES - NOT USED

DIVISION 07 - THERMAL AND MOISTURE PROTECTION - NOT USED

TABLE OF CONTENTS

DIVISION 08 - OPENINGS - NOT USED

DIVISION 09 - FINISHES - NOT USED

DIVISION 10 - SPECIALTIES

SECTION 10 1400 - Signage
 10 2813 - Toilet Accessories

DIVISION 11 - EQUIPMENT - NOT USED

DIVISION 12 - FURNISHINGS - NOT USED

DIVISION 13 - SPECIAL CONSTRUCTION - NOT USED

DIVISION 14 - CONVEYING EQUIPMENT - NOT USED

DIVISION 21 - FIRE SUPPRESSION - NOT USED

DIVISION 22 - PLUMBING - NOT USED

DIVISION 23 - HEATING, VENTILATING AND AIR CONDITIONING (HVAC) - NOT USED

DIVISION 26 - ELECTRICAL - NOT USED

DIVISION 27 - COMMUNICATIONS - NOT USED

DIVISION 28 - ELECTRONIC SAFETY AND SECURITY - NOT USED

DIVISION 31 - EARTHWORK

SECTION 31 0000 - Earthwork
 31 2333 - Trenching and Backfilling

DIVISION 32 - EXTERIOR IMPROVEMENTS

SECTION 32 1200 - Asphalt Concrete Paving
 32 1600 - Site Concrete
 32 1816.13 - Playground Protective Surfaces
 32 1816.16 - Synthetic Turf

DIVISION 33 - UTILITIES

SECTION 33 0000 - Utilities
 33 4000 - Storm Drainage Utilities

SUMMARY OF WORK

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Site Access Conditions and Requirements;
- B. Special Conditions.

1.02 SUMMARY OF WORK COVERED BY CONTRACT DOCUMENTS

- A. The Work of this Contract consists of the following at Wanda Hirsch Elementary School:
 - (1) Construction and installation of 1 - 30'x40' Four Post Hip PC shade structure, 1 - 20'x30' Full Hip Cantilever PC shade structure, 2-play apparatus with poured in place rubber surfacing, existing restroom upgrades and related civil and landscape upgrades.

1.03 CONTRACTS

- A. Perform the Work under a single, fixed-price Contract.

1.04 WORK BY OTHERS

- A. Fabrication of the shade structure and play apparatus.

1.05 CODES, REGULATIONS, AND STANDARDS

- A. The codes, regulations, and standards adopted by the state and federal agencies having jurisdiction shall govern minimum requirements for this Project. Where codes, regulations, and standards conflict with the Contract Documents, these conflicts shall be brought to the immediate attention of the District and the Architect.
- B. Codes, regulations, and standards shall be as published effective as of date of bid opening, unless otherwise specified or indicated.

1.06 PROJECT RECORD DOCUMENTS

- A. Contractor shall maintain on Site one set of the following record documents; Contractor shall record actual revisions to the Work:
 - (1) Contract Drawings.

- (2) Specifications.
 - (3) Addenda.
 - (4) Change Orders and other modifications to the Contract.
 - (5) Reviewed shop drawings, product data, and samples.
 - (6) Field test records.
 - (7) Inspection certificates.
 - (8) Manufacturer's certificates.
- B. Contractor shall store Record Documents separate from documents used for construction. Provide files, racks, and secure storage for Record Documents and samples.
 - C. Contractor shall record information concurrent with construction progress.
 - D. Specifications: Contractor shall legibly mark and record at each product section of the Specifications the description of the actual product(s) installed, including the following:
 - (1) Manufacturer's name and product model and number.
 - (2) Product substitutions or alternates utilized.
 - (3) Changes made by Addenda and Change Orders and written directives.

1.07 EXAMINATION OF EXISTING CONDITIONS

- A. Contractor shall be held to have examined the Project Site and acquainted itself with the conditions of the Site and of the streets or roads approaching the Site.
- B. Prior to commencement of Work, Contractor shall survey the Site and existing buildings and improvements to observe existing damage and defects such as cracks, sags, broken, missing or damaged glazing, other building elements and Site improvements, and other damage.
- C. Should Contractor observe cracks, sags, and other damage to and defects of the Site and adjacent buildings, paving, and other items not indicated in the Contract Documents, Contractor shall immediately report same to the District and the Architect.

1.08 CONTRACTOR'S USE OF PREMISES

- A. If unoccupied and only with District's prior written approval, Contractor may use the building(s) at the Project Site without limitation for its operations, storage, and office facilities for the performance of the Work. If the District chooses to beneficially occupy any building(s), Contractor must obtain the District's written approval for Contractor's use of spaces and types of

operations to be performed within the building(s) while so occupied. Contractor's access to the building(s) shall be limited to the areas indicated.

- B. If the space at the Project Site is not sufficient for Contractor's operations, storage, office facilities and/or parking, Contractor shall arrange and pay for any additional facilities needed by Contractor.
- C. Contractor shall not interfere with use of or access to occupied portions of the building(s) or adjacent property.
- D. Contractor shall maintain corridors, stairs, halls, and other exit-ways of building clear and free of debris and obstructions at all times.
- E. No one other than those directly involved in the demolition and construction, or specifically designated by the District or the Architect shall be permitted in the areas of work during demolition and construction activities.
- F. The Contractor shall install the construction fence and maintain that it will be locked when not in use. Keys to this fencing will be provided to the District.

1.09 PROTECTION OF EXISTING STRUCTURES AND UTILITIES

- A. The Drawings show above-grade and below-grade structures, utility lines, and other installations that are known or believed to exist in the area of the Work. Contractor shall locate these existing installations before proceeding with excavation and other operations that could damage same; maintain them in service, where appropriate; and repair damage to them caused by the performance of the Work. Should damage occur to these existing installations, the costs of repair shall be at the Contractor's expense and made to the District's satisfaction.
- B. Contractor shall be alert to the possibility of the existence of additional structures and utilities. If Contractor encounters additional structures and utilities, Contractor will immediately report to the District for disposition of same as indicated in the General Conditions.

1.10 UTILITY SHUTDOWNS AND INTERRUPTIONS

- A. Contractor shall give the District a minimum of three (3) days written notice in advance of any need to shut off existing utility services or to effect equipment interruptions. The District will set exact time and duration for shutdown, and will assist Contractor with shutdown. Work required to re-establish utility services shall be performed by the Contractor.
- B. Contractor shall obtain District's written approval as indicated in the General Conditions in advance of deliveries of material or equipment or other activities that may conflict with District's use of the building(s) or adjacent facilities.

1.11 STRUCTURAL INTEGRITY

- A. Contractor shall be responsible for and supervise each operation and work that could affect structural integrity of various building elements, both permanent and temporary.

- B. Contractor shall include structural connections and fastenings as indicated or required for complete performance of the Work.

PART 2 – PRODUCTS Not Used.

PART 3 – EXECUTION Not Used.

END OF DOCUMENT

ALLOWANCE

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Non-specified work.

1.2 RELATED SECTIONS

A. Document 01 10 00 (Summary of Work)

B. Document 01 29 00 (Application for Payment)

C. Document 01 33 00 (Submittal Procedures)

1.3 ALLOWANCES

- A. Included in the Contract, a stipulated sum/price of **[INSERT AMOUNT]** as an allowance for DSA Revisions within the limits set forth in the Contract Documents. This Allowance shall not be utilized without written approval by the District.
- B. Contractor's costs, without overhead and profit, for products, delivery, installation, labor, insurance, payroll, taxes, bonding and equipment rental will be included in Allowance Expenditure Directive authorizing expenditure of funds from this Allowance. No overhead and profit shall be added to the Allowance Expenditure Directive.
- C. Funds will be drawn from Allowance only with District approval evidenced by an Allowance Expenditure Directive.
- D. At Contract closeout, funds remaining in Allowance will be credited to District by Change Order.
- E. Whenever costs are more than the Allowance, the amount covered by the Allowance will be approved at cost. The Contract Price shall be adjusted by Change Order for amounts in excess of the Allowance.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

END OF DOCUMENT

PRODUCT OPTIONS AND SUBSTITUTIONS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. Instructions to Bidders;
- B. General Conditions, including, without limitation, Substitutions For Specified Items; and
- C. Special Conditions.

1.02 SUBSTITUTIONS OF MATERIALS AND EQUIPMENT

- A. Catalog numbers and specific brands or trade names followed by the designation "or equal" are used in conjunction with material and equipment required by the Specifications to establish the standards of quality, utility, and appearance required. Substitutions which are equal in quality, utility, and appearance to those specified may be reviewed subject to the provisions of the General Conditions.
- B. Wherever more than one manufacturer's product is specified, the first-named product is the basis for the design used in the work and the use of alternative-named manufacturers' products or substitutes may require modifications in that design. If such alternatives are proposed by Contractor and are approved by the District and/or the Architect, Contractor shall assume all costs required to make necessary revisions and modifications of the design resulting from the substitutions requested by the Contractor.
- C. When materials and equipment are specified by first manufacturer's name and product number, second manufacturer's name and "or approved equal," supporting data for the second product, if proposed by Contractor, shall be submitted in accordance with the requirements for substitutions. The District's Board has found and determined that certain item(s) shall be used on this Project based on the purpose(s) indicated pursuant to Public Contract Code section 3400(c). These findings, as well as the products and brand or trade names, have been identified in the Notice to Bidders.
- D. The Contractor will not be allowed to substitute specified items unless the request for substitution is submitted as follows:
 - (1) District must receive any notice of request for substitution of a specified item a minimum of ten (10) calendar days prior to bid opening.

- (2) Within 35 days after the date of the Notice of Award, the Contractor shall submit data substantiating the request(s) for all substitution(s) containing sufficient information to assess acceptability of product or system and impact on Project, including, without limitation, the requirements specified in the Special Conditions and the technical Specifications. Insufficient information shall be grounds for rejection of substitution.
- E. If the District and/or Architect, in reviewing proposed substitute materials and equipment, require revisions or corrections to be made to previously accepted Shop Drawings and supplemental supporting data to be resubmitted, Contractor shall promptly do so. If any proposed substitution is judged by the District and/or Architect to be unacceptable, the specified material or equipment shall be provided.
- F. Samples may be required. Tests required by the District and/or Architect for the determination of quality and utility shall be made at the expense of Contractor, with acceptance of the test procedure first given by the District.
- G. In reviewing the supporting data submitted for substitutions, the District and/or Architect will use for purposes of comparison all the characteristics of the specified material or equipment as they appear in the manufacturer's published data even though all the characteristics may not have been particularly mentioned in the Contract Documents. If more than two (2) submissions of supporting data are required, the cost of reviewing the additional supporting data shall be borne by Contractor, and the District will deduct the costs from the Contract Price. The Contractor shall be responsible for any re-design costs occasioned by District's acceptance and/or approval of any substitute.
- H. The Contractor shall, in the event that a substitute is less costly than that specified, credit the District with one hundred percent (100%) of the net difference between the substitute and the originally specified material. In this event, the Contractor agrees to execute a deductive Change Order to reflect that credit. In the event Contractor furnishes a material, process, or article more expensive than that specified, the difference in the cost of that material, process, or article so furnished shall be borne by Contractor.
- I. In no event shall the District be liable for any increase in Contract Price or Contract Time due to any claimed delay in the evaluation of any proposed substitute or in the acceptance or rejection of any proposed substitute.

PART 2 – PRODUCTS Not Used.

PART 3 – EXECUTION Not Used.

END OF DOCUMENT

DOCUMENT 01 26 00

CHANGES IN THE WORK

CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE PROVISIONS IN THE AGREEMENT, GENERAL CONDITIONS, AND SPECIAL CONDITIONS, IF USED, RELATED TO CHANGES AND/OR REQUESTS FOR CHANGES.

END OF DOCUMENT

DOCUMENT 01 29 00

**APPLICATION FOR PAYMENT AND
CONDITIONAL AND UNCONDITIONAL WAIVER AND RELEASE FORMS**

**CONTRACTOR SHALL COMPLY WITH ALL PROVISIONS IN THE GENERAL
CONDITIONS RELATED TO APPLICATIONS FOR PAYMENT AND/OR PAYMENTS.**

**CONDITIONAL WAIVER AND RELEASE
ON PROGRESS PAYMENT
(CIVIL CODE SECTION 8132)**

NOTICE: THIS DOCUMENT WAIVES THE CLAIMANT'S LIEN, STOP PAYMENT NOTICE, AND PAYMENT BOND RIGHTS EFFECTIVE ON RECEIPT OF PAYMENT. A PERSON SHOULD NOT RELY ON THIS DOCUMENT UNLESS SATISFIED THAT THE CLAIMANT HAS RECEIVED PAYMENT.

Name of Claimant: _____

Name of Customer: _____

Job Location: _____

Owner: _____

Through Date: _____

Conditional Waiver and Release

This document waives and releases lien, stop payment notice, and payment bond rights the claimant has for labor and service provided, and equipment and material delivered, to the customer on this job through the Through Date of this document. Rights based upon labor or service provided, or equipment or material delivered, pursuant to a written change order that has been fully executed by the parties prior to the date that this document is signed by the claimant, are waived and released by this document, unless listed as an Exception below. This document is effective only on the claimant's receipt of payment from the financial institution on which the following check is drawn:

Maker of Check: _____

Amount of Check: \$_____

Check Payable to: _____

Exceptions

This document does not affect any of the following:

- (1) Retentions.
- (2) Extras for which the claimant has not received payment.
- (3) The following progress payments for which the claimant has previously given a conditional waiver and release but has not received payment:

Date(s) of waiver and release: _____

Amount(s) of unpaid progress payment(s): \$_____

TRACY UNIFIED SCHOOL DISTRICT

**APPLICATION FOR PAYMENT AND
CONDITIONAL AND UNCONDITIONAL
WAIVER AND RELEASE FORMS
DOCUMENT 01 29 00-2**

- (4) Contract rights, including (A) a right based on rescission, abandonment, or breach of contract, and (B) the right to recover compensation for work not compensated by the payment.

Claimant's Signature: _____

Claimant's Title: _____

Date of Signature: _____

**UNCONDITIONAL WAIVER AND RELEASE
ON PROGRESS PAYMENT
(CIVIL CODE SECTION 8134)**

NOTICE TO CLAIMANT: THIS DOCUMENT WAIVES AND RELEASES LIEN, STOP PAYMENT NOTICE, AND PAYMENT BOND RIGHTS UNCONDITIONALLY AND STATES THAT YOU HAVE BEEN PAID FOR GIVING UP THOSE RIGHTS. THIS DOCUMENT IS ENFORCEABLE AGAINST YOU IF YOU SIGN IT, EVEN IF YOU HAVE NOT BEEN PAID. IF YOU HAVE NOT BEEN PAID, USE A CONDITIONAL WAIVER AND RELEASE FORM.

Name of Claimant: _____

Name of Customer: _____

Job Location: _____

Owner: _____

Through Date: _____

Unconditional Waiver and Release

This document waives and releases lien, stop payment notice, and payment bond rights the claimant has for labor and service provided, and equipment and material delivered, to the customer on this job through the Through Date of this document. Rights based upon labor or service provided, or equipment or material delivered, pursuant to a written change order that has been fully executed by the parties prior to the date that this document is signed by the claimant, are waived and released by this document, unless listed as an Exception below. The claimant has received the following progress payment: \$_____

Exceptions

This document does not affect any of the following:

- (1) Retentions.
- (2) Extras for which the claimant has not received payment.
- (3) Contract rights, including (A) a right based on rescission, abandonment, or breach of contract, and (B) the right to recover compensation for work not compensated by the payment.

Claimant's Signature: _____

Claimant's Title: _____

Date of Signature: _____

**CONDITIONAL WAIVER AND RELEASE
ON FINAL PAYMENT**
(CIVIL CODE SECTION 8136)

NOTICE: THIS DOCUMENT WAIVES THE CLAIMANT'S LIEN, STOP PAYMENT NOTICE, AND PAYMENT BOND RIGHTS EFFECTIVE ON RECEIPT OF PAYMENT. A PERSON SHOULD NOT RELY ON THIS DOCUMENT UNLESS SATISFIED THAT THE CLAIMANT HAS RECEIVED PAYMENT.

Name of Claimant: _____

Name of Customer: _____

Job Location: _____

Owner: _____

Conditional Waiver and Release

This document waives and releases lien, stop payment notice, and payment bond rights the claimant has for labor and service provided, and equipment and material delivered, to the customer on this job. Rights based upon labor or service provided, or equipment or material delivered, pursuant to a written change order that has been fully executed by the parties prior to the date that this document is signed by the claimant, are waived and released by this document, unless listed as an Exception below. This document is effective only on the claimant's receipt of payment from the financial institution on which the following check is drawn:

Maker of Check:

Amount of Check: \$_____

Check Payable to: _____

Exceptions

This document does not affect any of the following: _____

Disputed claims for extras in the amount of: \$_____

Claimant's Signature: _____

Claimant's Title: _____

Date of Signature: _____

**UNCONDITIONAL WAIVER AND RELEASE
ON FINAL PAYMENT**
(CIVIL CODE SECTION 8138)

NOTICE TO CLAIMANT: THIS DOCUMENT WAIVES AND RELEASES LIEN, STOP PAYMENT NOTICE, AND PAYMENT BOND RIGHTS UNCONDITIONALLY AND STATES THAT YOU HAVE BEEN PAID FOR GIVING UP THOSE RIGHTS. THIS DOCUMENT IS ENFORCEABLE AGAINST YOU IF YOU SIGN IT, EVEN IF YOU HAVE NOT BEEN PAID. IF YOU HAVE NOT BEEN PAID, USE A CONDITIONAL WAIVER AND RELEASE FORM.

Name of Claimant: _____

Name of Customer: _____

Job Location: _____

Owner: _____

Unconditional Waiver and Release

This document waives and releases lien, stop payment notice, and payment bond rights the claimant has for all labor and service provided, and equipment and material delivered, to the customer on this job. Rights based upon labor or service provided, or equipment or material delivered, pursuant to a written change order that has been fully executed by the parties prior to the date that this document is signed by the claimant, are waived and released by this document, unless listed as an Exception below. The claimant has been paid in full.

Exceptions

This document does not affect any of the following: _____

Disputed claims for extras in the amount of: \$_____

Claimant's Signature: _____

Claimant's Title: _____

Date of Signature: _____

PROJECT MEETINGS

PART 1 – GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions; and
- B. Special Conditions.

1.02 PROGRESS MEETINGS:

- A. Contractor shall schedule and hold regular weekly progress meetings after a minimum of one week's prior written notice of the meeting date and time to all Invitees as indicated below.
- B. Location: Contractor's field office.
- C. The Contractor shall notify and invite the following entities ("Invitees"):
 - (1) District Representative.
 - (2) Contractor.
 - (3) Contractor's Project Manager.
 - (4) Contractor's Superintendent.
 - (5) Subcontractors, as appropriate to the agenda of the meeting.
 - (6) Suppliers, as appropriate to the agenda of the meeting.
 - (7) Construction Manager, if any.
 - (8) Architect
 - (9) Engineer(s), if any and as appropriate to the agenda of the meeting.
 - (10) Others, as appropriate to the agenda of the meeting.
- D. The District's and/or the Architect's Consultants will attend at their discretion, in response to the agenda.
- E. The District representative, the Construction Manager, and/or another District Agent shall take and distribute meeting notes to attendees and other concerned parties. If exceptions are taken to anything in the meeting notes,

those exceptions shall be stated in writing to the District within five (5) working days following District's distribution of the meeting notes.

1.03 PRE-INSTALLATION/PERFORMANCE MEETING:

- A. Contractor shall schedule a meeting prior to the start of each of the demolition work phases. Contractor shall invite all Invitees to this meeting, and others whose work may affect or be affected by the quality of the demolition work.
- B. Contractor shall review in detail prior to this meeting, the manufacturer's requirements and specifications, applicable portions of the Contract Documents, Shop Drawings, and other submittals, and other related work. At this meeting, invitees shall review and resolve conflicts, incompatibilities, or inadequacies discovered or anticipated.
- C. Contractor shall review in detail Project conditions, schedule, requirements for performance, application, installation, and quality of completed Work, and protection of adjacent Work and property.
- D. Contractor shall review in detail means of protecting the completed Work during the remainder of the construction period.

PART 2 - PRODUCTS Not Used.

PART 3 - EXECUTION Not Used.

END OF DOCUMENT

SCHEDULING OF WORK

PART 1 – GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions;
- B. Special Conditions;
- C. Summary of Work; and
- D. Submittals.

1.02 SECTION INCLUDES

- A. Scheduling of Work under this Contract shall be performed by Contractor in accordance with requirements of this Section.
 - (1) Development of schedule, cost and resource loading of the schedule, monthly payment requests, and project status reporting requirements of the Contract shall employ computerized Critical Path Method ("CPM") scheduling ("CPM Schedule").
 - (2) CPM Schedule shall be cost loaded based on Schedule of Values as approved by District.
 - (3) Submit schedules and reports as specified in the General Conditions.
- B. Upon Award of Contract, Contractor shall immediately commence development of Initial and Original CPM Schedules to ensure compliance with CPM Schedule submittal requirements.

1.03 CONSTRUCTION SCHEDULE

- A. Within ten (10) days of issuance of the issuance Notice to Proceed and before request for first progress payment, the Contractor shall prepare and submit to the Project Manager a construction progress schedule conforming to the Milestone Schedule below.
- B. The Construction Schedule shall be continuously updated, and an updated schedule shall be submitted with each application for progress payment. Each revised schedule shall indicate the work actually accomplished during the previous period and the schedule for completion of the remaining work.

C. Milestone Schedule:

ACTIVITY DESCRIPTION

REQUIRED COMPLETION

CONSTRUCTION STARTS

05-26-2022

PHASE 1 DEMOLITION

PHASE 2 DEMOLITION

FINAL PROJECT COMPLETION

1.04 QUALIFICATIONS

- A. Contractor shall employ experienced scheduling personnel qualified to use the latest version of [i.e., Primavera Project Planner]. Experience level required is set forth below. Contractor may employ such personnel directly or may employ a consultant for this purpose.
- (1) The written statement shall identify the individual who will perform CPM scheduling.
 - (2) Capability and experience shall be verified by description of construction projects on which individual has successfully applied computerized CPM.
 - (3) Required level of experience shall include at least two (2) projects of similar nature and scope with value not less than three fourths ($\frac{3}{4}$) of the Total Bid Price of this Project. The written statement shall provide contact persons for referenced projects with current telephone and address information.
- B. District reserves the right to approve or reject Contractor's scheduler or consultant at any time. District reserves the right to refuse replacing of Contractor's scheduler or consultant, if District believes replacement will negatively affect the scheduling of Work under this Contract.

1.05 GENERAL

- A. Progress Schedule shall be based on and incorporate milestone and completion dates specified in Contract Documents.
- B. Overall time of completion and time of completion for each milestone shown on Progress Schedule shall adhere to times in the Contract, unless an earlier (advanced) time of completion is requested by Contractor and agreed to by District. Any such agreement shall be formalized by a Change Order.
- (1) District is not required to accept an early completion schedule, i.e., one that shows an earlier completion date than the Contract Time.
 - (2) Contractor shall not be entitled to extra compensation in event agreement is reached on an earlier completion schedule and Contractor completes its Work, for whatever reason, beyond completion date shown in its early completion schedule but within the Contract Time.

- (3) A schedule showing the work completed in less than the Contract Time, and that has been accepted by District, shall be considered to have Project Float. The Project Float is the time between the scheduled completion of the work and the Completion Date. Project Float is a resource available to both District and the Contractor.
- C. Ownership Project Float: Neither the District nor Contractor owns Project Float. The Project owns the Project Float. As such, liability for delay of the Completion Date rests with the party whose actions, last in time, actually cause delay to the Completion Date.
 - (1) For example, if Party A uses some, but not all of the Project Float and Party B later uses remainder of the Project Float as well as additional time beyond the Project Float, Party B shall be liable for the time that represents a delay to the Completion Date.
 - (2) Party A would not be responsible for the time since it did not consume the entire Project Float and additional Project Float remained; therefore, the Completion Date was unaffected by Party A.
- D. Progress Schedule shall be the basis for evaluating job progress, payment requests, and time extension requests. Responsibility for developing Contract CPM Schedule and monitoring actual progress as compared to Progress Schedule rests with Contractor.
- E. Failure of Progress Schedule to include any element of the Work, or any inaccuracy in Progress Schedule, will not relieve Contractor from responsibility for accomplishing the Work in accordance with the Contract. District's acceptance of schedule shall be for its use in monitoring and evaluating job progress, payment requests, and time extension requests and shall not, in any manner, impose a duty of care upon District, or act to relieve Contractor of its responsibility for means and methods of construction.
- F. Software: Use [i.e, District Project Planner for Windows, latest version]. Such software shall be compatible with Windows operating system. Contractor shall transmit contract file to District on compact disk at times requested by District.
- G. Transmit each item under the form approved by District.
 - (1) Identify Project with District Contract number and name of Contractor.
 - (2) Provide space for Contractor's approval stamp and District's review stamps.
 - (3) Submittals received from sources other than Contractor will be returned to the Contractor without District's review.

1.06 INITIAL CPM SCHEDULE

- A. Initial CPM Schedule submitted for review at the pre-construction conference shall serve as Contractor's schedule for up to ninety (90) calendar days after the Notice to Proceed.

- B. Indicate detailed plan for the Work to be completed in first ninety (90) days of the Contract; details of planned mobilization of plant and equipment; sequence of early operations; procurement of materials and equipment. Show Work beyond ninety (90) calendar days in summary form.
- C. Initial CPM Schedule shall be time scaled.
- D. Initial CPM Schedule shall be cost and resource loaded. Accepted cost and resource loaded schedule will be used as basis for monthly progress payments until acceptance of the Original CPM Schedule. Use of Initial CPM Schedule for progress payments shall not exceed ninety (90) calendar days.
- E. District and Contractor shall meet to review and discuss the Initial CPM Schedule within seven (7) calendar days after it has been submitted to District.
 - (1) District's review and comment on the schedule shall be limited to Contract conformance (with sequencing, coordination, and milestone requirements).
 - (2) Contractor shall make corrections to schedule necessary to comply with Contract requirements and shall adjust schedule to incorporate any missing information requested by District. Contractor shall resubmit Initial CPM Schedule if requested by District.
- F. If, during the first ninety (90) days after Notice to Proceed, the Contractor is of the opinion that any of the Work included on its Initial CPM Schedule has been impacted, the Contractor shall submit to District a written Time Impact Evaluation ("TIE") in accordance with Article 1.12 of this Section. The TIE shall be based on the most current update of the Initial CPM Schedule.

1.07 ORIGINAL CPM SCHEDULE

- A. Submit a detailed proposed Original CPM Schedule presenting an orderly and realistic plan for completion of the Work in conformance with requirements as specified herein.
- B. Progress Schedule shall include or comply with following requirements:
 - (1) Time scaled, cost and resource (labor and major equipment) loaded CPM schedule.
 - (2) No activity on schedule shall have duration longer than fifteen (15) work days, with exception of submittal, approval, fabrication and procurement activities, unless otherwise approved by District.
 - (a) Activity durations shall be total number of actual work days required to perform that activity.
 - (3) The start and completion dates of all items of Work, their major components, and milestone completion dates, if any.

- (4) District furnished materials and equipment, if any, identified as separate activities.
- (5) Activities for maintaining Project Record Documents.
- (6) Dependencies (or relationships) between activities.
- (7) Processing/approval of submittals and shop drawings for all material and equipment required per the Contract. Activities that are dependent on submittal acceptance or material delivery shall not be scheduled to start earlier than expected acceptance or delivery dates.
 - (a) Include time for submittals, re-submittals and reviews by District. Coordinate with accepted schedule for submission of Shop Drawings, samples, and other submittals.
 - (b) Contractor shall be responsible for all impacts resulting from re-submittal of Shop Drawings and submittals.
- (8) Procurement of major equipment, through receipt and inspection at jobsite, identified as separate activity.
 - (a) Include time for fabrication and delivery of manufactured products for the Work.
 - (b) Show dependencies between procurement and construction.
- (9) Activity description; what Work is to be accomplished and where.
- (10) The total cost of performing each activity shall be total of labor, material, and equipment, excluding overhead and profit of Contractor. Overhead and profit of the General Contractor shall be shown as a separate activity in the schedule. Sum of cost for all activities shall equal total Contract value.
- (11) Resources required (labor and major equipment) to perform each activity.
- (12) Responsibility code for each activity corresponding to Contractor or Subcontractor responsible for performing the Work.
- (13) Identify the activities which constitute the controlling operations or critical path. No more than twenty-five (25%) of the activities shall be critical or near critical. Near critical is defined as float in the range of one (1) to (10) days.
- (14) Twenty (20) workdays for developing punch list(s), completion of punch-list items, and final clean up for the Work or any designated portion thereof. No other activities shall be scheduled during this period.
- (15) Interface with the work of other contractors, District, and agencies such as, but not limited to, utility companies.

- (16) Show detailed Subcontractor Work activities. In addition, furnish copies of Subcontractor schedules upon which CPM was built.
 - (a) Also furnish for each Subcontractor, as determined by District, submitted on Subcontractor letterhead, a statement certifying that Subcontractor concurs with Contractor's Original CPM Schedule and that Subcontractor's related schedules have been incorporated, including activity duration, cost and resource loading.
 - (b) Subcontractor schedules shall be independently derived and not a copy of Contractor's schedule.
 - (c) In addition to Contractor's schedule and resource loading, obtain from electrical, mechanical, and plumbing Subcontractors, and other Subcontractors as required by District, productivity calculations common to their trades, such as units per person day, feet of pipe per day per person, feet of wiring per day per person, and similar information.
 - (d) Furnish schedule for Contractor/Subcontractor CPM schedule meetings which shall be held prior to submission of Original CPM schedule to District. District shall be permitted to attend scheduled meetings as an observer.
- (17) Activity durations shall be in Work days.
- (18) Submit with the schedule a list of anticipated non-Work days, such as weekends and holidays. The Progress Schedule shall exclude in its Work day calendar all non-Work days on which Contractor anticipates critical Work will not be performed.
- C. Original CPM Schedule Review Meeting: Contractor shall, within sixty (60) days from the Notice to Proceed date, meet with District to review the Original CPM Schedule submittal.
 - (1) Contractor shall have its Project Manager, Project Superintendent, Project Scheduler, and key Subcontractor representatives, as required by District, in attendance. The meeting will take place over a continuous one (1) day period.
 - (2) District's review will be limited to submittal's conformance to Contract requirements including, but not limited to, coordination requirements. However, review may also include:
 - (a) Clarifications of Contract Requirements.
 - (b) Directions to include activities and information missing from submittal.
 - (c) Requests to Contractor to clarify its schedule.

- (3) Within five (5) days of the Schedule Review Meeting, Contractor shall respond in writing to all questions and comments expressed by District at the Meeting.

1.08 ADJUSTMENTS TO CPM SCHEDULE

- A. Adjustments to Original CPM Schedule: Contractor shall have adjusted the Original CPM Schedule submittal to address all review comments from original CPM Schedule review meeting and resubmit network diagrams and reports for District's review.
 - (1) District, within ten (10) days from date that Contractor submitted the revised schedule, will either:
 - (a) Accept schedule and cost and resource loaded activities as submitted, or
 - (b) Advise Contractor in writing to review any part or parts of schedule which either do not meet Contract requirements or are unsatisfactory for District to monitor Project's progress, resources, and status or evaluate monthly payment request by Contractor.
 - (2) District may accept schedule with conditions that the first monthly CPM Schedule update be revised to correct deficiencies identified.
 - (3) When schedule is accepted, it shall be considered the "Original CPM Schedule" which will then be immediately updated to reflect the current status of the work.
 - (4) District reserves right to require Contractor to adjust, add to, or clarify any portion of schedule which may later be discovered to be insufficient for monitoring of Work or approval of partial payment requests. No additional compensation will be provided for such adjustments, additions, or clarifications.
- B. Acceptance of Contractor's schedule by District will be based solely upon schedule's compliance with Contract requirements.
 - (1) By way of Contractor assigning activity durations and proposing sequence of Work, Contractor agrees to utilize sufficient and necessary management and other resources to perform work in accordance with the schedule.
 - (2) Upon submittal of schedule update, updated schedule shall be considered "current" CPM Schedule.
 - (3) Submission of Contractor's schedule to District shall not relieve Contractor of total responsibility for scheduling, sequencing, and pursuing Work to comply with requirements of Contract Documents, including adverse effects such as delays resulting from ill-timed Work.

- C. Submittal of Original CPM Schedule, and subsequent schedule updates, shall be understood to be Contractor's representation that the Schedule meets requirements of Contract Documents and that Work shall be executed in sequence indicated on the schedule.
- D. Contractor shall distribute Original CPM Schedule to Subcontractors for review and written acceptance, which shall be noted on Subcontractors' letterheads to Contractor and transmitted to District for the record.

1.09 MONTHLY CPM SCHEDULE UPDATE SUBMITTALS

- A. Following acceptance of Contractor's Original CPM Schedule, Contractor shall monitor progress of Work and adjust schedule each month to reflect actual progress and any anticipated changes to planned activities.
 - (1) Each schedule update submitted shall be complete, including all information requested for the Original CPM Schedule submittal.
 - (2) Each update shall continue to show all Work activities including those already completed. These completed activities shall accurately reflect "as built" information by indicating when activities were actually started and completed.
- B. A meeting will be held on approximately the twenty-fifth (25th) of each month to review the schedule update submittal and progress payment application.
 - (1) At this meeting, at a minimum, the following items will be reviewed: Percent (%) complete of each activity; Time Impact Evaluations for Change Orders and Time Extension Request; actual and anticipated activity sequence changes; actual and anticipated duration changes; and actual and anticipated Contractor delays.
 - (2) These meetings are considered a critical component of overall monthly schedule update submittal and Contractor shall have appropriate personnel attend. At a minimum, these meetings shall be attended by Contractor's General Superintendent and Scheduler.
 - (3) Contractor shall plan on the meeting taking no less than four (4) hours.
- C. Within five (5) working days after monthly schedule update meeting, Contractor shall submit the updated CPM Schedule update.
- D. Within five (5) work days of receipt of above noted revised submittals, District will either accept or reject monthly schedule update submittal.
 - (1) If accepted, percent (%) complete shown in monthly update will be basis for Application for Payment by the Contractor. The schedule update shall be submitted as part of the Contractor's Application for Payment.

- (2) If rejected, update shall be corrected and resubmitted by Contractor before the Application for Payment is submitted.
- E. Neither updating, changing or revising of any report, curve, schedule, or narrative submitted to District by Contractor under this Contract, nor District's review or acceptance of any such report, curve, schedule or narrative shall have the effect of amending or modifying in any way the Completion Date or milestone dates or of modifying or limiting in any way Contractor's obligations under this Contract.

1.10 SCHEDULE REVISIONS

- A. Updating the Schedule to reflect actual progress shall not be considered revisions to the Schedule. Since scheduling is a dynamic process, revisions to activity durations and sequences are expected on a monthly basis.
- B. To reflect revisions to the Schedule, the Contractor shall provide District with a written narrative with a full description and reasons for each Work activity revised. For revisions affecting the sequence of work, the Contractor shall provide a schedule diagram which compares the original sequence to the revised sequence of work. The Contractor shall provide the written narrative and schedule diagram for revisions two (2) working days in advance of the monthly schedule update meeting.
- C. Schedule revisions shall not be incorporated into any schedule update until the revisions have been reviewed by District. District may request further information and justification for schedule revisions and Contractor shall, within three (3) days, provide District with a complete written narrative response to District's request.
- D. If the Contractor's revision is still not accepted by District, and the Contractor disagrees with District's position, the Contractor has seven (7) calendar days from receipt of District's letter rejecting the revision to provide a written narrative providing full justification and explanation for the revision. The Contractor's failure to respond in writing within seven (7) calendar days of District's written rejection of a schedule revision shall be contractually interpreted as acceptance of District's position, and the Contractor waives its rights to subsequently dispute or file a claim regarding District's position.
- E. At District's discretion, the Contractor can be required to provide Subcontractor certifications of performance regarding proposed schedule revisions affecting said Subcontractors.

1.11 RECOVERY SCHEDULE

- A. If the Schedule Update shows a completion date twenty-one (21) calendar days beyond the Contract Completion Date, or individual milestone completion dates, the Contractor shall submit to District the proposed revisions to recover the lost time within seven (7) calendar days. As part of this submittal, the Contractor shall provide a written narrative for each revision made to recapture the lost time. If the revisions include sequence changes, the Contractor shall provide a schedule diagram comparing the original sequence to the revised sequence of work.

- B. The revisions shall not be incorporated into any schedule update until the revisions have been reviewed by District.
- C. If the Contractor's revisions are not accepted by District, District and the Contractor shall follow the procedures in paragraph 1.09.C, 1.09.D and 1.09.E above.
- D. At District's discretion, the Contractor can be required to provide Subcontractor certifications for revisions affecting said Subcontractors.

1.12 TIME IMPACT EVALUATION ("TIE") FOR CHANGE ORDERS, AND OTHER DELAYS

- A. When Contractor is directed to proceed with changed Work, the Contractor shall prepare and submit within fourteen (14) calendar days from the Notice to Proceed a TIE which includes both a written narrative and a schedule diagram depicting how the changed Work affects other schedule activities. The schedule diagram shall show how the Contractor proposes to incorporate the changed Work in the schedule and how it impacts the current schedule-update critical path. The Contractor is also responsible for requesting time extensions based on the TIE's impact on the critical path. The diagram must be tied to the main sequence of schedule activities to enable District to evaluate the impact of changed Work to the scheduled critical path.
- B. Contractor shall be required to comply with the requirements of Paragraph 1.09.A for all types of delays such as, but not limited to, Contractor/Subcontractor delays, adverse weather delays, strikes, procurement delays, fabrication delays, etc.
- C. Contractor shall be responsible for all costs associated with the preparation of TIEs, and the process of incorporating them into the current schedule update. The Contractor shall provide District with four (4) copies of each TIE.
- D. Once agreement has been reached on a TIE, the Contract Time will be adjusted accordingly. If agreement is not reached on a TIE, the Contract Time may be extended in an amount District allows, and the Contractor may submit a claim for additional time claimed by contractor.

1.13 TIME EXTENSIONS

- A. The Contractor is responsible for requesting time extensions for time impacts that, in the opinion of the Contractor, impact the critical path of the current schedule update. Notice of time impacts shall be given in accord with the General Conditions.
- B. Where an event for which District is responsible impacts the projected Completion Date, the Contractor shall provide a written mitigation plan, including a schedule diagram, which explains how (e.g., increase crew size, overtime, etc.) the impact can be mitigated. The Contractor shall also include a detailed cost breakdown of the labor, equipment, and material the Contractor would expend to mitigate District-caused time impact. The Contractor shall submit its mitigation plan to District within fourteen (14)

calendar days from the date of discovery of the impact. The Contractor is responsible for the cost to prepare the mitigation plan.

- C. Failure to request time, provide TIE, or provide the required mitigation plan will result in Contractor waiving its right to a time extension and cost to mitigate the delay.
- D. No time will be granted under this Contract for cumulative effect of changes.
- E. District will not be obligated to consider any time extension request unless the Contractor complies with the requirements of Contract Documents.
- F. Failure of the Contractor to perform in accordance with the current schedule update shall not be excused by submittal of time extension requests.
- G. If the Contractor does not submit a TIE within the required fourteen (14) calendar days for any issue, it is mutually agreed that the Contractor does not require a time extension for said issue.

1.14 SCHEDULE REPORTS

- A. Submit four (4) copies of the following reports with the Initial CPM Schedule, the Original CPM Schedule, and each monthly update.
- B. Required Reports:
 - (1) Two activity listing reports: one sorted by activity number and one by total Project Float. These reports shall also include each activity's early/late and actual start and finish dates, original and remaining duration, Project Float, responsibility code, and the logic relationship of activities.
 - (2) Cost report sorted by activity number including each activity's associated cost, percentage of Work accomplished, earned value- to date, previous payments, and amount earned for current update period.
 - (3) Schedule plots presenting time-scaled network diagram showing activities and their relationships with the controlling operations or critical path clearly highlighted.
 - (4) Cash flow report calculated by early start, late start, and indicating actual progress. Provide an exhibit depicting this information in graphic form.
 - (5) Planned versus actual resource (i.e., labor) histogram calculated by early start and late start.
- C. Other Reports:

In addition to above reports, District may request, from month to month, any two of the following reports. Submit four (4) copies of all reports.

- (1) Activities by early start.
 - (2) Activities by late start.
 - (3) Activities grouped by Subcontractors or selected trades.
 - (4) Activities with scheduled early start dates in a given time frame, such as fifteen (15) or thirty (30) day outlook.
- D. Furnish District with report files on compact disks containing all schedule files for each report generated.

1.15 PROJECT STATUS REPORTING

- A. In addition to submittal requirements for CPM scheduling identified in this Section, Contractor shall provide a monthly project status report (i.e., written narrative report) to be submitted in conjunction with each CPM Schedule as specified herein. Status reporting shall be in form specified below.
- B. Contractor shall prepare monthly written narrative reports of status of Project for submission to District. Written status reports shall include:
- (1) Status of major Project components (percent (%) complete, amount of time ahead or behind schedule) and an explanation of how Project will be brought back on schedule if delays have occurred.
 - (2) Progress made on critical activities indicated on CPM Schedule.
 - (3) Explanations for any lack of work on critical path activities planned to be performed during last month.
 - (4) Explanations for any schedule changes, including changes to logic or to activity durations.
 - (5) List of critical activities scheduled to be performed next month.
 - (6) Status of major material and equipment procurement.
 - (7) Any delays encountered during reporting period.
 - (8) Contractor shall provide printed report indicating actual versus planned resource loading for each trade and each activity. This report shall be provided on weekly and monthly basis.
 - (a) Actual resource shall be accumulated in field by Contractor, and shall be as noted on Contractor's daily reports. These reports will be basis for information provided in computer-generated monthly and weekly printed reports.
 - (b) Contractor shall explain all variances and mitigation measures.

- (9) Contractor may include any other information pertinent to status of Project. Contractor shall include additional status information requested by District at no additional cost.
- (10) Status reports, and the information contained therein, shall not be construed as claims, notice of claims, notice of delay, or requests for changes or compensation.

1.16 WEEKLY SCHEDULE REPORT

At the Weekly Progress Meeting, the Contractor shall provide and present a time-scaled three (3) week look-ahead schedule that is based and correlated by activity number to the current schedule (i.e., Initial, Original CPM, or Schedule Update).

1.17 DAILY CONSTRUCTION REPORTS

On a daily basis, Contractor shall submit a daily activity report to District for each workday, including weekends and holidays when worked. Contractor shall develop the daily construction reports on a computer-generated database capable of sorting daily Work, manpower, and man-hours by Contractor, Subcontractor, area, sub-area, and Change Order Work. Upon request of District, furnish computer disk of this data base. Obtain District's written approval of daily construction report data base format prior to implementation. Include in report:

- A. Project name and Project number.
- B. Contractor's name and address.
- C. Weather, temperature, and any unusual site conditions.
- D. Brief description and location of the day's scheduled activities and any special problems and accidents, including Work of Subcontractors. Descriptions shall be referenced to CPM scheduled activities.
- E. Worker quantities for its own Work force and for Subcontractors of any tier.
- F. Equipment, other than hand tools, utilized by Contractor and Subcontractors.

1.18 PERIODIC VERIFIED REPORTS

Contractor shall complete and verify construction reports on a form prescribed by the Division of the State Architect and file reports on the first day of February, May, August, and November during the preceding quarter year; at the completion of the Contract; at the completion of the Work; at the suspension of Work for a period of more than one (1) month; whenever the services of Contractor or any of Contractor's Subcontractors are terminated for any reason; and at any time a special verified report is required by the Division of the State Architect. Refer to section 4-336 and section 4-343 of Part 1, Title 24 of the California Code of Regulations.

PART 2 – PRODUCTS Not Used.

PART 3 - EXECUTION Not Used.

END OF DOCUMENT

SUBMITTALS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Contractor's Submittals and Schedules, Drawings and Specifications;
- B. Special Conditions.

1.02 SECTION INCLUDES:

- A. Definitions:
 - (1) Shop Drawings and Product Data are as indicated in the General Conditions and include, but are not limited to, fabrication, erection, layout and setting drawings, formwork and falsework drawings, manufacturers' standard drawings, descriptive literature, catalogues, brochures, performance and test data, wiring and control diagrams. In addition, there are other drawings and descriptive data pertaining to materials, equipment, piping, duct and conduit systems, and methods of construction as may be required to show that the materials, equipment or systems and all positions conform to the requirement of the Contract Documents, including, without limitation, the Drawings.
 - (2) "Manufactured" applies to standard units usually mass-produced; "fabricated" means specifically assembled or made out of selected materials to meet design requirements. Shop Drawings shall establish the actual detail of manufactured or fabricated items, indicated proper relation to adjoining work and amplify design details of mechanical and electrical equipment in proper relation to physical spaces in the structure.
 - (3) Manufacturer's Instructions: Where any item of Work is required by the Contract Documents to be furnished, installed, or performed, at a minimum, in accordance with a specified product manufacturer's instructions, the Contractor shall procure and distribute copies of these to the District, the Architect, and all other concerned parties and shall furnish, install, or perform the work, at a minimum, in accordance with those instructions.
- B. Samples, Shop Drawings, Product Data, and other items as specified, in accordance with the following requirements:
 - (1) Contractor shall submit all Shop Drawings, Product Data, and Samples to the District, the Architect, the Project Inspector, and the Construction Manager.

Contractor to review section
01 3300 as well as this
document

- (2) Contractor shall comply with all time frames herein and in the General Conditions and, in any case, shall submit required information in sufficient time to permit proper consideration and action before ordering any materials or items represented by such Shop Drawings, Product Data, and/or Samples.
- (3) Contractor shall allow sufficient time so that no delay occurs due to required lead time in ordering or delivery of any item to the Site. Contractor shall be responsible for any delay in progress of Work due to its failure to observe these requirements.
- (4) Time for completion of Work shall not be extended on account of Contractor's failure to promptly submit Shop Drawings, Product Data, and/or Samples.
- (5) Reference numbers on Shop Drawings shall have Architectural and/or Engineering Contract Drawings reference numbers for details, sections, and "cuts" shown on Shop Drawings. These reference numbers shall be in addition to any numbering system that Contractor chooses to use or has adopted as standard.
- (6) When the magnitude or complexity of submittal material prevents a complete review within the stated time frame, Contractor shall make this submittal in increments to avoid extended delays.
- (7) Contractor shall certify on submittals for review that submittals conform to Contract requirements. Also certify that Contractor-furnished equipment can be installed in allocated space. In event of any variance, Contractor shall specifically state in transmittal and on Shop Drawings, portions vary and require approval of a substitute. Submittals shall not be used as a means of requesting a substitution.
- (8) Unless specified otherwise, sampling, preparation of samples, and tests shall be in accordance with the latest standard of the American Society for Testing and Materials.
- (9) Upon demand by Architect or District, Contractor shall submit samples of materials and/or articles for tests or examinations and consideration before Contractor incorporates same in Work. Contractor shall be solely responsible for delays due to sample(s) not being submitted in time to allow for tests. Acceptance or rejection will be expressed in writing. Work shall be equal to approved samples in every respect. Samples that are of value after testing will remain the property of Contractor.

C. Submittal Schedule:

- (1) Contractor shall prepare its proposed submittal schedule that is coordinated with the proposed construction schedule and submit both to the District within ten (10) days after the date of the Notice to Proceed. Contractor's proposed schedules shall become the Project Construction Schedule and the Project Submittal Schedule after each is approved by the District.

Contractor to review section
01 3300 as well as this
document

- (2) Contractor is responsible for all lost time should the initial submittal be rejected, marked "revise and resubmit", etc.
- (3) All Submittals shall be forwarded to the District by the date indicated on the approved Submittal Schedule, unless an earlier date is necessary to maintain the Construction Schedule, in which case those Submittals shall be forwarded to the District so as not to delay the Construction Schedule.
- (4) Contractor may be assessed \$100 a day for each day it is late in submitting a shop drawing or sample. No extensions of time will be granted to Trade Contractor or any Subcontractor because of its failure to have shop drawings and samples submitted in accordance with the Schedule.

1.03 SHOP DRAWINGS:

- A. Contractor shall submit one reproducible transparency and six (6) opaque reproductions. The District will review and return the reproducible copy and one (1) opaque reproduction to Contractor.
- B. Before commencing installation of any Work, the Contractor shall submit and receive approval of all drawings, descriptive data, and material list(s) as required to accomplish Work.
- C. Review of Shop Drawings is regarded as a service to assist Contractor and in all cases original Contract Documents shall take precedence as outlined under General Conditions.
- D. No claim for extra time or payment shall be based on work shown on Shop Drawings unless the claim is (1) noted on Contractor's transmittal letter accompanying Shop Drawings and (2) Contractor has complied with all applicable provisions of the General Conditions, including, without limitation, provisions regarding changes and payment, and all required written approvals.
- E. District shall not review Shop Drawings for quantities of materials or number of items supplied.
- F. District's and/or Architect's review of Shop Drawing will be general. District and/or Architect review does not relieve Contractor of responsibility for dimensions, accuracy, proper fitting, construction of Work, furnishing of materials, or Work required by Contract Documents and not indicated on Shop Drawings. The District's and/or Architect's review of Shop Drawings is not to be construed as approving departures from Contract Documents.
- G. Review of Shop Drawings and Schedules does not relieve Contractor from responsibility for any aspect of those Drawings or Schedules that is a violation of local, County, State, or Federal laws, rules, ordinances, or rules and regulations of commissions, boards, or other authorities or utilities having jurisdiction.
- H. Before submitting Shop Drawings for review, Contractor shall check Shop Drawings of its subcontractors for accuracy, and confirm that all Work

Contractor to review section
01 3300 as well as this
document

contiguous with and having bearing on other work shown on Shop Drawings is accurately drawn and in conformance with Contract Documents.

- I. Submitted drawings and details must bear stamp of approval of Contractor:
 - (1) Stamp and signature shall clearly certify that Contractor has checked Shop Drawings for compliance with Drawings.
 - (2) If Contractor submits a Shop Drawing without an executed stamp of approval, or whenever it is evident (despite stamp) that Drawings have not been checked, the District and/or Architect will not consider them and will return them to the Contractor for revision and resubmission. In that event, it will be deemed that Contractor has not complied with this provision and Contractor shall bear risk of all delays to same extent as if it had not submitted any Shop Drawings or details.
- J. Submission of Shop Drawings (in either original submission or when resubmitted with correction) constitutes evidence that Contractor has checked all information thereon and that it accepts and is willing to perform Work as shown.
- K. Contractor shall pay for cost of any changes in construction due to improper checking and coordination. Contractor shall be responsible for all additional costs, including coordination. Contractor shall be responsible for costs incurred by itself, the District, the Architect, the Project Inspector, the Construction Manager, any other Subcontractor or contractor, etc., due to improperly checked and/or coordination of submittals.
- L. Shop Drawings must clearly delineate the following information:
 - (1) Project name and address.
 - (2) Specification number and description.
 - (3) Architect's name and project number.
 - (4) Shop Drawing title, number, date, and scale.
 - (5) Names of Contractor, Subcontractor(s) and fabricator.
 - (6) Working and erection dimensions.
 - (7) Arrangements and sectional views.
 - (8) Necessary details, including complete information for making connections with other Work.
 - (9) Kinds of materials and finishes.
 - (10) Descriptive names of materials and equipment, classified item numbers, and locations at which materials or equipment are to be installed in the Work. Contractor shall use same reference identification(s) as shown on Contract Drawings.

Contractor to review section
01 3300 as well as this
document

- M. Contractor shall prepare composite drawings and installation layouts when required to solve tight field conditions.
 - (1) Shop Drawings shall consist of dimensioned plans and elevations and must give complete information, particularly as to size and location of sleeves, inserts, attachments, openings, conduits, ducts, boxes, structural interferences, etc.
 - (2) Contractor shall coordinate these composite Shop Drawings and installation layouts in the field between itself and its Subcontractor(s) for proper relationship to the Work, the work of other trades, and the field conditions. The Contractor shall check and approve all submittal(s) before submitting them for final review.

1.04 PRODUCT DATA OR NON REPRODUCIBLE SUBMITTALS:

- A. Contractor shall submit manufacturer's printed literature in original form. Any fading type of reproduction will not be accepted. Contractor must submit a minimum of six (6) each, to the District. District shall return one (1) to the Contractor, who shall reproduce whatever additional copies it requires for distribution.
- B. Contractor shall submit six (6) copies of a complete list of all major items of mechanical, plumbing, and electrical equipment and materials in accordance with the approved Submittal Schedule, except as required earlier to comply with the approved Construction Schedule. Other items specified are to be submitted prior to commencing Work. Contractor shall submit items of like kind at one time in a neat and orderly manner. Partial lists will not be acceptable.
- C. Submittals shall include manufacturer's specifications, physical dimensions, and ratings of all equipment. Contractor shall furnish performance curves for all pumps and fans. Where printed literature describes items in addition to that item being submitted, submitted item shall be clearly marked on sheet and superfluous information shall be crossed out. If highlighting is used, Contractor shall mark all copies.
- D. Equipment submittals shall be complete and include space requirements, weight, electrical and mechanical requirements, performance data, and supplemental information that may be requested.
- E. Imported Materials Certification must be submitted at least ten (10) days before material is delivered.

1.05 SAMPLES:

- A. Contractor shall submit for approval Samples as required and within the time frame in the Contract Documents. Materials such as concrete, mortar, etc., which require on-site testing will be obtained from Project Site.
- B. Contractor shall submit four (4) samples except where greater or lesser number is specifically required by Contract Documents including, without limitation, the Specifications.

Contractor to review section
01 3300 as well as this
document

- (1) Samples must be of sufficient size and quality to clearly illustrate functional characteristics, with integrally related parts and attachment devices.
 - (2) Samples must show full range of texture, color, and pattern.
- C. Contractor shall make all Submittals, unless it has authorized Subcontractor(s) to submit and Contractor has notified the District in writing to this effect.
- D. Samples to be shipped prepaid or hand-delivered to the District.
- E. Contractor shall mark samples to show name of Project, name of Contractor submitting, Contract number and segment of Work where representative Sample will be used, all applicable Specifications Sections and documents, Contract Drawing Number and detail, and ASTM or FS reference, if applicable.
- F. Contractor shall not deliver any material to Site prior to receipt of District's and/or Architect's completed written review and approval. Contractor shall furnish materials equal in every respect to approved Samples and execute Work in conformance therewith.
- G. District's and/or Architect's review, acceptance, and/or approval of Sample(s) will not preclude rejections of any material upon discovery of defects in same prior to final acceptance of completed Work.
- H. After a material has been approved, no change in brand or make will be permitted.
- I. Contractor shall prepare its Submittal Schedule and submit Samples of materials requiring laboratory tests to specified laboratory for testing not less than ninety (90) days before such materials are required to be used in Work.
- J. Samples which are rejected must be resubmitted promptly after notification of rejection and be marked "Resubmitted Sample" in addition to other information required.
- K. Field Samples and Mock-Ups are to be removed by Contractor at District's direction:
 - (1) Size: As Specified.
 - (2) Furnish catalog numbers and similar data, as requested.

1.06 REVIEW AND RESUBMISSION REQUIREMENTS:

- A. The District will arrange for review of Sample(s), Shop Drawing(s), Product Data, and other submittal(s) by appropriate reviewer and return to Contractor as provided below within twenty-one (21) days after receipt or within twenty-one (21) days after receipt of all related information necessary for such review, whichever is later.
- B. One (1) copy of product or materials data will be returned to Contractor with the review status.

Contractor to review section
01 3300 as well as this
document

- C. Samples to be incorporated into the Work will be returned to Contractor, together with a written notice designating the Sample with the appropriate review status and indicating errors discovered on review, if any. Other Samples will not be returned, but the same notice will be given with respect thereto, and that notice shall be considered a return of the Sample.
- D. Contractor shall revise and resubmit any Sample(s), Shop Drawing(s), Product Data, and other submittal(s) as required by the reviewer. Such resubmittals will be reviewed and returned in the same manner as original Sample(s), Shop Drawing(s), Product Data, and other submittal(s), within fourteen (14) days after receipt thereof or within fourteen (14) days after receipt of all related information necessary for such review. Such resubmittal shall not delay the Work.
- E. Contractor may proceed with any of the Work covered by Sample(s), Shop Drawing(s), Product Data, and other submittal(s) upon its return if designated as no exception taken, or revise as noted, provided the Contractor proceeds in accordance with the District and/or the Architect's notes and comments.
- F. Contractor shall not begin any of the work covered by a Sample(s), Shop Drawing(s), Product Data, and other submittal(s), designated as revise and resubmit or rejected, until a revision or correction thereof has been reviewed and returned to Contractor.
- G. Sample(s), Shop Drawing(s), Product Data, and other submittal(s) designated as revise and resubmit or rejected and requiring resubmittal, shall be revised or corrected and resubmitted to the District no later than fourteen (14) days or a shorter period as required to comply with the approved Construction Schedule, after its return to Contractor.
- H. Neither the review nor the lack of review of any Sample(s), Shop Drawing(s), Product Data, and other submittal(s) shall waive any of the requirements of the Contract Documents, or relieve Contractor of any obligation thereunder.
- I. District's and/or Architect's review of Shop Drawings does not relieve the Contractor of responsibility for any errors that may exist. Contractor is responsible for the dimensions and design of adequate connections and details and for satisfactory construction of all the Work.

PART 2 – PRODUCTS Not Used.

PART 3 - EXECUTION Not Used.

END OF DOCUMENT

George Kelly Elementary School - Shade Structures **SUBMITTAL NO.:**
Tracy Unified School District

Architect's Project # 3595001

DATE: _____

DSA File/Apl. # XX-XX/XX-XXXXXX

Re-Submittal of Original No.: _____

1. SUBMITTAL TRANSMITTAL

Attention: Affifa Kadhim

Contractor: Company

Contact: Name _____

Sub Contractor:

Contact: _____

HMC
Architects

Please submit only one trade per submittal! Description of submitted materials:

Quantity submitted	Specification Section		Description of contents (e.g. product data, shop drawings, samples)
	Section #	Section Title	

Contractor Statement: (read and acknowledge)

This submittal has been reviewed and approved with respect to the means, methods, techniques, and procedures of construction, safety precautions, and program incidentals thereto. This submittal complies with the contract documents and comprises no variations thereto, unless accompanied by a substitution request.

By: _____
Name

Date: _____

2. RE-TRANSMITTAL TO CONTRACTOR:

Distribution: Contractor, Owner, Project Inspector, RGA, Other

- ☐ NO EXCEPTIONS TAKEN
☐ SUBMIT SPECIFIED ITEM

- ☐ REJECTED
☐ REVISE AND RESUBMIT

- ☐ FURNISH AS CORRECTED
☐ NO ACTION REQUIRED

Corrections or comments made on the shop drawings during this review do not relieve the Contractor from compliance with requirements of the Drawings and Specifications. This general check is only for the review of conformance with the design concept of the project and general compliance with the information given in the Contract Documents. The Contractor is responsible for confirming and correlating all quantities and dimensions, selecting fabrication processes and techniques of construction, coordinating his work with that of all the other trades, and performing his work in a safe and satisfactory manner.

HMC ARCHITECTS

By: _____

Date: _____

Additional Comments:

See Specification Section 01 3300 for use of this form

George Kelly Elementary School - Shade Structures
Tracy Unified School District

**SUBSTITUTION
REQUEST NO.:**

Architect's Project # 3595001
DSA File/Appl. # XX-XX/XX-XXXXXX

Date: _____

1. SUBSTITUTION REQUEST

Attention: Affifa Kadhim

HMC
Architects

Contractor: Company _____

Contact: Name _____

Please submit only one product per request!

Sub Contractor: _____

Include with a specified product Submittal

Contact: _____

2. PROPOSED SUBSTITUTIONS: The undersigned requests consideration of the following substitution:

Specified Item: _____ Page No.: _____ Paragraph No.: _____

Proposed Item: _____

3. REASON FOR REQUEST:

4. REQUIREMENTS FOR SUBSTITUTIONS:

Attached data includes product description, specifications, drawings, photographs, performance and test data adequate for evaluation of request; applicable portions of data are clearly identified. Attached data also includes a description of changes to Contract Documents, which proposed substitution will require for its proper installation.

The undersigned certifies that the following paragraphs, unless modified by attachments, are correct:

1. The proposed substitution does not affect dimensions shown on drawings and does not require design changes in the Contract Documents.
2. The undersigned will pay for changes to the building design, including engineering design, detailing and construction costs caused by the requested substitution.
3. The proposed substitution will have no adverse effect on the work, the schedule or specified warranty requirements.
4. Maintenance and service parts will be readily available for the proposed substitution.

The undersigned further states that the function, appearance and quality of the proposed substitution are equivalent or superior to the specified item.

Signature - Contractor/Subcontractor _____

Date _____

5. TRANSMITTAL TO CONTRACTOR:

Distribution: Contractor, Owner, Project Inspector, RGA, Other

☐ ACCEPTED

☐ ACCEPTED AS NOTED

☐ REJECTED

HMC ARCHITECTS

By: _____

Date: _____

Comments:

George Kelly Elementary School - Shade Structures
Tracy Unified School District

RFI NO.:

Architect's Project # 3595001
DSA File/Apl. # XX-XX/XX-XXXXXX

Date: _____

1. REQUEST FOR INFORMATION

Attention: Affifa Kadhim

From:

Contractor:

Company

Contact:

Name

Sub Contractor:

Contact:

HMC
Architects

Identify related specific references within the Contract Documents and supporting information:

Dwg./Document No.: _____

Building/Site Location: _____

2. Existing Condition (source / reason for the request):

3. Recommended Contractor Action(s) for resolution:

4. Project Inspector Acknowledgment:

Date Reviewed: _____

5. Owner / A/E Resolution(s):

Date of Response: _____ By: _____

Attachments: _____

Extra Work Involved in the Above Described Change?

Yes ☐

No ☐

Distribution: Contractor, Owner, Project Inspector, HMC, Other
See Specification Section 01300 for use of this form

HMC, Other

George Kelly Elementary School - Shade Structures
Tracy Unified School District

**E-DATA
REQUEST NO.:**

Architect's Project # 3595001
DSA File/Appl. # XX-XX/XX-XXXXXX

Date: _____

1. ELECTRONIC DATA REQUEST

Attention: Affifa Kadhim

From: Contractor: Company

Contact: Name

Sub Contractor:

Contact: _____

HMC
Architects

2. DATA REQUESTED - Provide list of specific drawings requested (include sheet numbers):

3. REASON FOR REQUEST - Provide clear explanation of why information is desired and for what purpose it will be utilized:

4. ACKNOWLEDGEMENT OF RESPONSIBILITY:

The electronic data files requested are distributed for reference only. Transferring such files can alter, delete or change original information. Accuracy of the data cannot be guaranteed as correct or complete and the Contractor accepts full responsibility for any and all inaccuracies, regardless of cause.

The hard copy documents, including addenda and subsequent written changes to the documents, represent the complete work of the contract and all electronic files should be cross-referenced and verified from that information as electronic files may not contain all contract information. It is the Contractor's responsibility to make any changes or revisions necessary.

This electronic data is furnished without guarantee of compatibility with your hardware or software. It is the Contractor's responsibility to notify the Architect in the event a compatibility problem or disk defect is encountered and a replacement disk is necessary.

This electronic data, in its present form, remains the property of HMC Architects and shall not be used for any other purpose than to provide background information for the project noted above. It is not to be released to any other party without the written consent of HMC Architects.

Accepted by: _____
Signature - Contractor/Subcontractor

Representing: _____
Contractor/Subcontractor Company Name

MEGGER GROUNDING TEST CERTIFICATE

This certifies that a Megger Grounding Test for the _____ **[name of project]** _____ for the _____ **[name of District]** _____ School District, of _____ **[name of county]** _____ County, California was conducted on the _____ day of _____, **[year]**, per CCR Title 24, Sections 200 H and J. The undersigned verifies that the resistance to ground was 25 ohms or less, as required, and is found to be acceptable.

Project Name: _____

DSA File No.: _____ DSA Application No.: _____

Address: _____

General Contractor's Signature: _____

Electrical Contractor's Signature: _____

Testing Agency's Signature: _____

District Inspector's Signature: _____

SEPARATE CERTIFICATE IS REQUIRED FOR EACH SITE

CERTIFICATION OF CHLORINATION AND STERILIZATION

This certifies that _____ chlorinated the domestic hot and cold water plumbing lines for the **[name of project]**, **[name of district]** School District. The lines were first flushed and chlorine was injected in the main water line on _____, **[year]**. A minimum chlorine residual of 50 ppm was measured at each outlet. The lines were tagged, secured and the make-up water was shut off. On _____, **[year]**, (a minimum of 24 hours later) the chlorine residual was retested and found to contain a minimum of 50 ppm. The plumbing lines were then thoroughly flushed with fresh water until the chlorine residual was not greater than 0.2 ppm at all outlets. A Bacteriological Examination report has been provided.

District Inspector Signature: _____

Date _____

Name of Chlorination and Testing Firm: _____

Authorized Representative Signature: _____

Date _____

Name of General Contractor: _____

Authorized Representative Signature: _____

Date _____

CERTIFICATION OF COMPLIANCE FOR BUILDING MATERIALS

This is to certify, in accordance with the Environmental Protection Agency requirements, that the materials and equipment used in the construction of the [project name] for the [district name] School District of [name of county] County, California, are asbestos free and are, therefore, not subject to monitoring for asbestos contamination.

Project Name: _____

Address: _____

Contractor: _____

Address: _____

Signature: _____

Title: _____

Date: _____

SEPARATE CERTIFICATE IS REQUIRED FOR EACH SITE

ROOFING CERTIFICATION

This is to certify that a representative of the manufacturer has visited the site prior to installation, inspected the surfaces which the roofing is applied and accepted those surfaces.

In addition, a representative of the manufacturer has inspected the materials and methods used, verified they are in accordance with the manufacturer's recommendations, and accepts the final installation.

A guarantee for materials and workmanship is to be provided separately.

Project name: _____

Address: _____

General Contractor: _____

Roofing Contractor: _____

Scope of Work/Roofing Type: _____

Roofing Manufacturer: _____

Manufacturer's Representative: _____

Representative's Signature: _____

Date: _____

A SEPARATE CERTIFICATE IS REQUIRED FOR EACH SITE
AND FOR EACH ROOFING TYPE

SITE STANDARDS

PART 1 – GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including without limitation, Site Access, Conditions, and Regulations;
- B. Special Conditions;
- C. Drug-Free Workplace Certification;
- D. Tobacco-Free Environment Certification;
- E. Criminal Background Investigation/Fingerprinting Certification;
- F. Temporary Facilities and Controls.

1.02 REQUIREMENTS OF THE DISTRICT:

- A. Drug-Free Schools and Safety Requirements:
 - (1) All school sites and other District Facilities have been declared "Drug-Free Zones." No drugs, alcohol and/or smoking are allowed at any time in any buildings and/or grounds on District property. No students, staff, visitors, or contractors are to use drugs on these sites.
 - (2) Smoking and the use of tobacco products by all persons is prohibited on or in District property. District property includes school buildings, school grounds, school-owned vehicles and vehicles owned by others while on District property. Contractor shall post: "Non-Smoking Area" in a highly visible location in each work area, staging area, and parking area. Contractor may designate a smoking area outside of District property within the public right-of-way, provided that this area remains quiet and unobtrusive to adjacent neighbors. This smoking area is to be kept clean at all times.
 - (3) Contractor shall ensure that no alcohol, firearms, weapons, or controlled substances enter or are used at the Site. Contractor shall immediately remove from the Site and terminate the employment of any employee(s) found in violation of this provision.
- B. Language: Profanity or other unacceptable and/or loud language will not be tolerated, "Cat calls" or other derogatory language toward students, staff, volunteers, parents or public will not be allowed.

C. Disturbing the Peace (Noise and Lighting):

- (1) Contractor shall observe the noise ordinance of the Site at all times including, without limitation, all applicable local, city, and/or state laws, ordinances, and/or regulations regarding noise and allowable noise levels.
- (2) The use of radios, etc., shall be controlled to keep all sound at a level that cannot be heard beyond the immediate area of use. District reserves the right to prohibit the use of radios at the Site, except for mobile phones or other handheld communication radios.
- (3) If portable lights are used after dark, all light must be located so as not to direct light into neighboring property.

D. Traffic:

- (1) Driving on the Premises shall be limited to periods when students and public are not present. If driving or deliveries must be made during the school hours, two (2) or more ground guides shall lead the vehicle across the area of travel. In no case shall driving take place across playgrounds or other pedestrian paths during recess, lunch, and/or class period changes. The speed limit on-the Premises shall be five (5) miles per hour (maximum) or less if conditions require.
- (2) All paths of travel for deliveries, including without limitation, material, equipment, and supply deliveries, shall be reviewed and approved by District in advance. Any damage will be repaired to the pre-damaged condition by the Contractor.
- (3) District shall designate a construction entry to the Site. If Contractor requests, District determines it is required, and to the extent possible, District shall designate a staging area so as not to interfere with the normal functioning of school facilities. Location of gates and fencing shall be approved in advance with District and at Contractor's expense.
- (4) Parking areas shall be reviewed and approved by District in advance. No parking is to occur under the drip line of trees or in softscape areas that could otherwise be damaged.

- E. All of the above shall be observed and complied with by the Contractor and all workers on the Site. Failure to follow these directives could result in individual(s) being suspended or removed from the work force at the discretion of the District. The same rules and regulations shall apply equally to delivery personnel, inspectors, consultants, and other visitors to the Site.

PART 2 - PRODUCTS Not Used.

PART 3 - EXECUTION Not Used.

END OF DOCUMENT

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Alteration requirements for modernizations, remodels, and additions.

1.2 RELATED REQUIREMENTS

- A. Section 01 1100, Summary of Work.
- B. Section 01 5000, Temporary Facilities and Controls.
- C. Section 01 7329, Cutting and Patching.

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CALGreen), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Coordination:
 - 1. Contractor to coordinate and conduct a meeting with the demolition contractor to verify which systems, if any, are to be protected and maintained. Such systems shall be clearly identified and marked to avoid unnecessary damage or removal.
 - 2. Coordinate work of alterations and renovations to expedite completion sequentially and to accommodate Owner occupancy.

1.5 QUALITY ASSURANCE

- A. Manufacturer and Installer Qualifications: As specified in the product specifications.
- B. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.
- C. Single Source Responsibility: Use materials and products of one manufacturer whenever possible.
- D. All materials, components, assemblies, workmanship and installation are to be observed by the Owner's Inspector of Record. Work not so inspected is subject to uncovering and replacement.

ALTERATION PROJECT PROCEDURES
SECTION 01 3516
3595001

1.6 FIELD CONDITIONS

- A. Make and be responsible for all field dimensions necessary for proper fitting and completion of work. Report discrepancies to Architect before proceeding.

PART 2 - PRODUCTS

2.1 PRODUCTS FOR PATCHING AND EXTENDING WORK

- A. New Materials: As specified in product Sections; match existing products and work for patching and extending work.
- B. Type and Quality of Existing Products: Determine by inspection and testing products where necessary, referring to existing work as a standard.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that demolition is complete and areas are ready for installation of new work.
- B. Inspect conditions of uncovered work affecting installation of products or performance work.
- C. Verify that specified items may be installed in accordance with the approved design.
- D. Beginning of restoration work means acceptance of existing conditions.
- E. In event of discrepancy, immediately notify Architect. Do not proceed in discrepant areas until discrepancies have been fully resolved.

3.2 PREPARATION

- A. Close openings in exterior surfaces to protect existing work and salvage items for weather and extremes of temperature and humidity. Insulate ductwork and piping to prevent condensation in exposed areas.
- B. Cut, move or remove items as necessary for access to alterations and renovation work.
- C. Remove debris and abandoned items from area and from concealed spaces.
- D. Remove unsuitable material not marked for salvage, such as rotted wood, corroded metals, and deteriorated masonry and concrete.
- E. Prepare surface, and remove surface finishes to provide for proper installation of new work and finishes including blocking, framing, insulation, etc.
- F. Replace materials as specified for finished work.

3.3 INSTALLATION

- A. Complete Project in all respects.
- B. Remove, cut and patch work in a manner to minimize damage and to provide a means of restoring products and finishes to original condition, and installation of concealed work, as specified in Section 01 7329, Cutting and Patching,
- C. Install products as specified in individual specifications Sections.
- D. Where materials or equipment are removed, but no new finish is scheduled, patch and repair any damage to match existing wall surface.

3.4 TRANSITIONS

- A. Where new work abuts or aligns with existing, perform a smooth and even transition. Patched work is to match existing adjacent work in texture and appearance.
- B. When finished surfaces are cut so that a smooth transition with new work is not possible, terminate existing surface along a straight line at a natural point of division and make recommendation to Architect.

3.5 ADJUSTMENTS

- A. Where removal of partitions or walls results in adjacent spaces becoming one, rework floors, walls and ceilings to a smooth plane without breaks, steps or bulkheads.
- B. Where a change of plane of 1/8" or more occurs, submit recommendation for providing a smooth transition for Architect review.
- C. Fit work at penetrations of surfaces as specified in Section 01 7329.

3.6 FINISHES

- A. Finish surfaces as specified in individual Product Sections.
- B. Finish patches to produce uniform finish and texture over entire area. When finish cannot be matched, refinish entire surface to nearest intersections.

3.7 REPAIR OF DAMAGED SURFACES

- A. Patch or replace portions of existing surfaces which are damaged, lifted, discolored, or showing other imperfections.
- B. Repair substrate prior to patching finish.
- C. In the event of damage, make all repairs and replacements necessary to the approval of the Architect at no additional cost to the Owner.

ALTERATION PROJECT PROCEDURES
SECTION 01 3516
3595001

3.8 CLEANING

- A. Upon completion of installation, remove manufacturer's temporary labels and marks of identification. Thoroughly clean surfaces and remove foreign material. Leave entire work in neat, orderly, clean and acceptable condition.

3.9 PROTECTION

- A. Protect work and materials of this Section prior to and during installation, and protect the installed work and materials of other trades.
- B. Exposed finishes shall be free from scratches, dents, permanent discolorations and other defects in workmanship or material.

END OF SECTION

*p:\sacramento\3595 tracy unified school district\001-000_villalovoz es new shade structures\08 specifications\06 spec\04 final\freiler
- shade struct\01 3516 _alteration project procedures.docx
Last Updated: December 16, 2021*

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Special environmental, sustainable, and “green” building practices related to indoor air quality, resource efficiency supplementing the Pollutant Control requirements specified under Section 01 8113.10, Sustainable Design Requirements, and to ensure healthy indoor air quality in final Project.
- B. Contractor is required to comply with sustainable building practices during construction and when considering materials for substitutions. Refer to Article “Design Requirements.”

1.2 RELATED REQUIREMENTS

- A. Section 01 6116, Volatile Organic Compound (VOC) Restrictions.
- B. Section 01 7419, Construction Waste Management and Disposal.
- C. Section 01 8113, Sustainable Design Requirements.

1.3 ADMINISTRATIVE REQUIREMENTS

- A. Submittal Procedures:
 - 1. Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
 - 2. Sustainable Design Submittals shall comply with the additional requirement of Section 01 8113, Sustainable Design Requirements.
 - 3. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.

1.4 DESIGN REQUIREMENTS

- A. Owner has established general environmental goals for design and for construction of the Project.
 - 1. In addition to the Contractor, the Contractor’s construction team, including subcontractors, suppliers, and manufacturers, are encouraged to participate where possible to realize the Owner’s environmental goals.
 - 2. Intent is for environmental goals to be achieved in a manner which ultimately provides a safe and healthy environment for building occupants with minimal impact on the local, regional and global environment.
- B. Environmental Goals:
 - 1. Refer to specific Specifications Sections for more detailed construction requirements related to specific materials and systems.

ENVIRONMENTAL PROCEDURES
SECTION 01 3543
3595001

1.5 INFORMATIONAL SUBMITTALS

A. Indoor Air Quality (IAQ) Data:

1. Environmental Issues: Submit emission test data produced by acceptable testing laboratory, listed in this Specification Article "Quality Assurance," for materials as required in each specific Specification Section.
 - a. Laboratory reports shall contain emissions test data on Volatile Organic Compounds (VOCs) including Total Volatile Organic Compounds (TVOC), specific individual VOCs, formaldehyde and other aldehydes as described in this Section.
 - b. Identify VOCs emitted by each material as required in these Specifications, and demonstrate compliance with the California Green Building Standards Code, edition current as of the date of this Contract.
 - c. Specific test conditions and requirements are set forth in the Specifications. For required tests, submit documentation of sample acquisition, handling, and test specimen preparation, as well as test conditions, methods, and procedures. The tests consist of a 10-day conditioning period followed by a 96-hour test period.
 - 1) Samples collected during the test period at 24, 48, and 96-hours shall be analyzed for TVOC and formaldehyde.
 - 2) VOC samples collected at 96 hours shall be identified and quantified for compounds that are found on the list of Chemicals of Concern. The Chemicals of Concern list is based on the California OEHHA list as of September 2002 (The most recent list shall be used for this Specification as published at:
 - a) http://www.oehha.org/air/chronic_rels/allChrels.html.
2. Cleaning and Maintenance Products: Provide data on manufacturers' recommended maintenance, cleaning, refinishing and disposal procedures for materials and products. These procedures are for final Contractor cleaning of the project prior to Substantial Completion and for provided materials and products as required by the specific Specification Sections.
 - a. Where chemical products are recommended for these procedures, provide documentation to indicate that no component present in the cleaning product at more than 1 percent of the total mass of the cleaning product is a carcinogen or reproductive toxicant as identified in the Chemicals of Concern list referenced above.
 - b. Avoid cleaning products containing alpha-pinene, d-limonene or other unsaturated carbon double bond alkenes due to chemical reactions with ozone to form aldehydes, acidic aerosols, and ultra-fine particulate matter in indoor air.

B. Certificates:

1. Prior to Final Completion, submit a certificate signed by corporate office holder of Contractor, subcontractor, supplier, vendor, installer or manufacturer primarily responsible for the manufacturing of the product, indicating materials provided are

essentially the same, and contain essentially the same components as products and materials tested.

2. Comply with requirements specified in Specification Section 01 7700, Closeout Procedures.

1.6 CLOSEOUT SUBMITTALS

- A. Submit data relating to Environmental Issues.
 1. Submit environmental product certifications, in two forms:
 - a. Two CD-ROMs organized by CSI Division Format.
 - b. Three three-ring binders organized by CSI Division Format with Table of Contents and with dividers for each Division.

1.7 QUALITY ASSURANCE

- A. Environmental Project Management and Coordination: Contractor to identify one person on Contractor's staff to be responsible for environmental issues compliance and coordination.
 1. Experience: Environmental project manager shall have experience relating to sustainable building construction.
 2. Responsibilities: Carefully review the Contract Documents for environmental issues, coordinate work of trades, subcontractors, and suppliers; instruct workers relating to environmental issues; and oversee Project Environmental Goals.
 3. Meetings: Discuss Environmental Goals at following meetings.
 - a. Pre-construction meeting.
 - b. Pre-installation meetings.
 - c. Regularly scheduled job-site meetings.
 - d. Special sustainability issues meetings.
- B. Environmental Issues Criteria: Comply with requirements listed in the Specification Sections.
- C. Acceptable Indoor Air Emissions Testing Laboratories:
 1. Selection of testing laboratories shall include assessment of prior experience in conducting indoor source emissions tests.
 2. The proposed laboratory shall be an independent company or organization not related to the manufacturer of the products to be tested.
 3. Submit documentation on proposed laboratory for review and approval by Owner.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Packaging: Deliver materials in recyclable or in reusable packaging such as cardboard, wood, paper, or reusable blankets, which will be reclaimed by supplier or manufacturer for recycling.

ENVIRONMENTAL PROCEDURES

SECTION 01 3543

3595001

1. Minimize packaging materials to maximum extent possible while still ensuring protection of materials during delivery, storage, and handling.
 2. Unacceptable Packaging Materials: Polyurethane, polyisocyanate, polystyrene, polyethylene, and similar plastic materials such as “foam” plastics and “shrink-fit” plastics.
 3. Reusable Blankets: Deliver and store materials in reusable blankets and mats reclaimed by the manufacturers or suppliers for reuse where the reclamation program exists or where a program can be developed for such reuse.
 4. Pallets: Where pallets are used, suppliers shall be responsible to ensure pallets are removed from site for reuse or for recycling.
 5. Corrugated Cardboard and Paper: Where paper products are used, recycle as part of the construction waste management recycling program, or return to the material’s manufacturer for use by the manufacturer or supplier.
 6. Sealants, Paint, Primers, Adhesives, and Coating Containers: Return to the supplier or manufacturer for reuse where such program is available.
- B. Comply with the additional requirements specified in Section 01 7419, Construction Waste Management and Disposal.

1.9 FIELD CONDITIONS

- A. No smoking will be permitted in indoor Project site locations, in accordance with California Labor Code (Section 400-6413.5).
- B. Environmental Product Certification:
1. Include certification that indicates cleaning materials comply with requirements of these Specifications.
- C. Construction Ventilation and Preconditioning:
1. Temporary Construction Ventilation: Maintain sufficient temporary ventilation of areas where materials are being used that emit VOCs. Maintain ventilation continuously during installation, and until emissions dissipate following installation. If continuous ventilation is not possible utilizing the building’s HVAC system(s) then ventilation shall be supplied using open windows and temporary fans, sufficient to provide no less than three air changes per hour.
 - a. Period after installation shall be sufficient to dissipate odors and elevated concentrations of VOCs. Where no specific period is stated in these Specifications, a time period of 72 hours shall be used.
 - b. Ventilate areas directly to outside; ventilation to other enclosed areas is not acceptable.
 2. During dust producing activities, including drywall installation and finishing, turn ventilation system off, and openings in supply and return HVAC system shall be protected from dust infiltration. Provide temporary ventilation as required.
 3. Preconditioning: Prior to installation, allow products which have odors and significant VOC emissions to off-gas in dry, well-ventilated space for 14 calendar days to allow for reasonable dissipation of odors and emissions prior to delivery to Project site and installation.

- a. Condition products without containers and packaging to maximize off-gassing of VOCs
 - b. Condition products in ventilated warehouse or other building. Comply with substitution requirements for consideration of other locations.
- D. Protection:
 - 1. Moisture Stains: Materials with evidence of moisture damage, including stains, are not acceptable, including both stored and installed materials; immediately remove from site and properly dispose.
 - a. Take special care to prevent an accumulation of moisture on installed materials and within packaging during delivery, storage, and handling to prevent development of molds and mildew on packaging and on products
 - b. Immediately remove from site and properly dispose of materials showing signs of mold and signs of mildew, including materials with moisture stains.
 - c. Replace moldy materials with new, undamaged materials.
 - 2. Ducts: Seal ducts during transportation, delivery, and construction to prevent accumulation of construction dust and construction debris inside of ducts.

PART 2 - PRODUCTS

2.1 SUBSTITUTIONS

- A. Requests for substitutions shall comply with requirements specified in Specification Section 01 3300, Submittals, and with the following additional information required where environmental issues are specified:
 - 1. Indicate how each proposed substitution complies with requirements for VOCs.
 - 2. Owner, in consultation with Architect reserve the right to reject proposed substitutions where data for VOCs is not provided or where emissions of individual VOCs are higher than for the specified materials.
 - 3. Comply with the specified recycled content and other environmental requirements.

PART 3 - EXECUTION

3.1 FIELD QUALITY CONTROL

- A. Sequencing:
 - 1. On-Site Application: Where odorous and/or high VOC emitting products are applied on-site, apply prior to installation of porous and fibrous materials. Where this is not possible, protect porous materials with polyethylene vapor retarders.
 - 2. Complete interior finish material installation no less than 14 days prior to Substantial Completion to allow for Building Flush Out as described in Paragraph 3.1B.

ENVIRONMENTAL PROCEDURES

SECTION 01 3543

3595001

- B. Building Flush Out: Just prior to Substantial Completion, flush out building air continuously using maximum tempered outside air, or maximum amount of outside air while achieving reasonable indoor temperature, for at least 14 calendar days. Continuously is defined as 24 hours per day, 7 days a week. If interruptions of more than a few hours are required for testing and balancing purposes, extend flush out period accordingly in order to achieve the minimum 14 calendar day building flush out period.
 - 1. When Contractor is required to perform touch-up work, provide temporary construction ventilation during installation and extend building flush-out by a minimum of 4 calendar days after touch-up installation is complete with maximum tempered outside air for 24 hours per day.
 - 2. If construction schedule permits, extend flush-out period beyond minimum building flush out period for an additional 15 days.
 - 3. Return ventilation system to normal operation following flush-out period to minimize energy consumption.

3.2 CLEANING

- A. Clean interior and exterior surfaces exposed to view; remove temporary labels, stains, and foreign substances; polish transparent and glossy surfaces using cleaning and maintenance products that conform to standards as described in Part 1 of this Section.
- B. Clean equipment and fixtures to sanitary condition using cleaning and maintenance products that conform to standards as described in Part 1 of this Section.
- C. Products used for cleaning shall comply with Proposition 65 and the additional restrictions for volatile organic compounds specified in Section 01 6116.
- D. Vacuum carpeted and soft surfaces with high efficiency particulate arrestor (HEPA) vacuum.
- E. If ducts were not sealed during construction, and contain dust or dirt, clean ducts using HEPA vacuum immediately prior to Substantial Completion and prior to using ducts to circulate air. Oil film on sheet metal shall be removed before shipment to site. Ducts shall be inspected to confirm that no oil film is present. Remove oil film.
- F. Replace air filters, both pre and final filters, just prior to Substantial Completion.
- G. Remove and properly dispose of recyclable materials using construction waste management program described in Section 01 7419, Construction Waste Management and Disposal.

3.3 PROTECTION

- A. Protect interior materials from water intrusion or penetration where interior products are not intended for wet applications and are exposed to moisture.
- B. Protect installed products using methods that do not support growth of mold and mildew.

ENVIRONMENTAL PROCEDURES
SECTION 01 3543
3595001

1. Immediately remove from site materials with mold or mildew.

END OF SECTION

*p:\sacramento\3595 tracy unified school district\001-000_villalovoz es new shade structures\08 specifications\06 spec\04 final\freiler
- shade struct\01 3543_environmental procedures.docx*

REGULATORY REQUIREMENTS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Obtaining of Permits, Licenses and Registrations and Work to Comply with All Applicable Laws and Regulations;
- B. Special Conditions; and
- C. Quality Control.

1.02 DESCRIPTION:

This section covers the general requirements for regulatory requirements pertaining to the Work and is supplementary to all other regulatory requirements mentioned or referenced elsewhere in the Contract Documents.

1.03 REQUIREMENTS OF REGULATORY AGENCIES:

- A. All statutes, ordinances, laws, rules, codes, regulations, standards, and the lawful orders of all public authorities having jurisdiction over the Work, are hereby incorporated into these Contract Documents as if repeated in full herein and are intended to be included in any reference to Code or Building Code, unless otherwise specified, including, without limitation, the references in the list below. Contractor shall make available at the Site copies of all the listed documents applicable to the Work as the District and/or Architect may request, including, without limitation, applicable portions of the California Code of Regulations ("CCR").
 - (1) California Building Standards Administrative Code, Part 1, Title 24, CCR.
 - (2) California Building Code (CBC), Part 2, Title 24, CCR; (International Building Code volumes 1-2 and California Amendments).
 - (3) California Electrical Code (CEC), Part 3, Title 24, CCR; (National Electrical Code and California Amendments).
 - (4) California Mechanical Code (CMC), Part 4, Title 24, CCR; (Uniform Mechanical Code and California Amendments).
 - (5) California Plumbing Code (CPC), Part 5, Title 24, CCR; (Uniform Plumbing Code and California Amendments).

- (6) California Fire Code (CFC), Part 9, Title 24, CCR; (International Fire Code and California Amendments).
- (7) California Green Building Standards Code (CALGreen), Part 11, Title 24, CCR.
- (8) California Referenced Standards Code, Part 12, Title 24, CCR.
- (9) State Fire Marshal Regulations, Public Safety, Title 19, CCR.
- (10) Partial List of Applicable National Fire Protection Association (NFPA) Standards:
 - (a) NFPA 13 - Automatic Sprinkler System.
 - (b) NFPA 14 - Standpipes Systems.
 - (c) NFPA 17A - Wet Chemical System
 - (d) NFPA 24 - Private Fire Mains.
 - (e) (California Amended) NFPA 72 - National Fire Alarm Codes.
 - (f) NFPA 253 - Critical Radiant Flux of Floor Covering System.
 - (g) NFPA 2001 - Clean Agent Fire Extinguishing Systems.
- (11) California Division of the State Architect interpretation of Regulations ("DSA IR"), including, without limitation:
 - (a) DSA IR A-6 — Construction Change Document Submittal and Approval Processes.
 - (b) DSA IR A-7 — Project Inspector Certification and Approval.
 - (c) DSA IR A-8 — Project Inspector and Assistant Inspector Duties and Performance.
 - (d) DSA IR A-12 — Assistant Inspector Approval.
- (12) DSA Procedures ("DSA PR")
 - (a) DSA PR 13-01 – Construction Oversight Process
 - (b) DSA PR 13-02 – Project Certification Process

B. This Project shall be governed by applicable regulations, including, without limitation, the State of California's Administrative Regulations for the Division of the State Architect-Structural Safety (DSA/SS), Chapter 4, Part 1, Title 24, CCR, and the most current version on the date the bids are opened and as it pertains to school construction including, without limitation:

- (1) Test and testing laboratory per Section 4-335. District shall pay for the testing laboratory.
- (2) Special inspections per Section 4-333(c).
- (3) Deferred Approvals per section 4-317(g).
- (4) Verified reports per Sections 4-336 & 4-343(c).
- (5) Duties of the Architect & Engineers shall be per Sections 4-333(a) and 4-341.
- (6) Duties of the Contractor shall be per Section 4-343.
- (7) Duties of Project Inspector shall be per Section 4-334.
- (8) Addenda and Construction Change Documents per Section 4-338.

Contractor shall keep and make available all applicable parts of the most current version of Title 24 referred to in the plans and specifications at the Site during construction.

C. Items of deferred approval shall be clearly marked on the first sheet of the Architect's and/or Engineer's approved Drawings. All items later submitted for approval shall be per Title 24 requirements to the DSA.

- (1) Contractor shall submit the following to Architect for review and endorsement:
 - (a) Product information on proposed material/system supplier.
 - (b) Drawings, specifications, and calculations prepared, signed, and stamped by an architect or engineer licensed in the State of California for that portion of the Work.
 - (c) All other requirements as may be required by DSA.
- (2) Cost of preparing and submitting documentation per DSA Deferred Approval requirements including required modifications to Drawings and Specifications, whether or not indicated in the Contract Documents, shall be borne by Contractor.
- (3) Contractor shall not begin fabrication and installation of deferred approval items without first obtaining DSA approval of Drawings and Specifications.
- (4) Schedule of Work Subject to DSA Deferred Approval: Window wall systems exceeding 10 feet in span.

PART 2 – PRODUCTS Not Used.

PART 3 – EXECUTION Not Used.

END OF DOCUMENT

ABBREVIATIONS AND ACRONYMS

PART 1 – GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions including without limitation, Definitions;
- B. Special Conditions.

1.02 DOCUMENT INCLUDES:

- A. Abbreviations used throughout the Contract Documents.
- B. Reference to a technical society, organization, or body is by abbreviation, as follows:

1.	AA	The Aluminum Association
2.	AASHTO	American Association of State Highway and Transportation Officials
3.	ABPA	Acoustical and Board Products Association
4.	ACI	American Concrete Institute
5.	AGA	American Gas Association
6.	AGC	Associated General Contractors of America
7.	AHC	Architectural Hardware Consultant
8.	AHRI	Air Conditioning, Heating, Refrigeration Institute
9.	AI	Asphalt Institute
10.	AIA	American Institute of Architects
11.	AISC	American Institute of Steel Construction
12.	AISI	American Iron and Steel Institute
13.	AMCA	Air Movement and Control Association
14.	ANSI	American National Standards Institute
15.	APA	APA – The Engineered Wood Association
16.	ASCE	American Society of Civil Engineers
17.	ASHRAE	American Society of Heating, Refrigeration and Air Conditioning Engineers
18.	ASME	American Society of Mechanical Engineers
19.	ASTM	American Society of Testing and Materials International
20.	AWPA	American Wood Protection Association
21.	AWPI	American Wood Preservers Institute
22.	AWS	American Welding Society
23.	AWSC	American Welding Society Code
24.	AWI	Architectural Woodwork Institute
25.	AWWA	American Water Works Association
26.	BIA	The Brick Industry Association

27.	CCR	California Code of Regulations
28.	CLFMI	Chain Link Fence Manufacturers Institute
29.	CRA	California Redwood Association
30.	CRSI	Concrete Reinforcing Steel Institute
31.	CS	Commercial Standards
32.	CSI	Construction Specifications Institute
33.	CTI	Cooling Technology Institute
34.	FGIA	Fenestration and Glazing Industry Alliance
35.	FGMA	Flat Glass Manufacturers' Association
36.	FIA	Factory Insurance Association
37.	FM	Factory Mutual Global
38.	FS/FED SPEC	Federal Specification
39.	FTI	Facing Title Institute
40.	GA	Gypsum Association
41.	IAPMO	International Association of Plumbing and Mechanical Officials
42.	ICC	International Code Council
43.	IEEE	Institute of Electrical and Electronics Engineers
44.	IES	Illuminating Engineering Society
45.	MCAC	Mason Contractors Association of California
46.	MIMA	Mineral Wool Insulation Manufacturers Association
47.	MLMA	Metal Lath Manufacturers Association
48.	MS/MIL SPEC	Military Specifications
49.	NAAMM	National Association of Architectural Metal Manufacturers
50.	NBHA	National Builders Hardware Association
51.	NCMA	National Concrete Masonry Association
52.	NCSEA	National Council of Structural Engineers Associations
53.	NEC	National Electrical Code
54.	NEMA	National Electrical Manufacturers Association
55.	NIST	National Institute of Standards and Technology
56.	NSI	Natural Stone Institute
57.	NTMA	National Terrazzo and Mosaic Association, Inc.
58.	ORS	Office of Regulatory Services (California)
59.	OSHA	Occupational Safety and Health Act
60.	PCI	Precast/Prestressed Concrete Institute
61.	PCA	Portland Cement Association
62.	PCA	Painting Contractors Association
63.	PDI	Plumbing Drainage Institute
64.	PEI	Porcelain Enamel Institute, Inc.
65.	PG&E	Pacific Gas & Electric Company
66.	PS	Product Standards
67.	SDI	Steel Door Institute; Steel Deck Institute
68.	SJI	Steel Joist Institute
69.	SSPC	Society for Protective Coatings
70.	TCNA	Tile Council of North America, Inc.
71.	TPI	Truss Plate Institute
72.	UBC	Uniform Building Code
73.	UL	Underwriters Laboratories Code

74.	UMC	Uniform Mechanical Code
75.	USDA	United States Department of Agriculture
76.	VI	Vermiculite Institute
77.	WCLIB	West Coast Lumber Inspection Bureau
78.	WDMA	Window and Door Manufacturers Association
79.	WEUSER	Western Electric Utilities Service Engineering Requirements
80.	WIC	Woodwork Institute of California

PART 2 - PRODUCTS Not Used.

PART 3 - EXECUTION Not Used.

END OF DOCUMENT

DEFINITIONS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions including without limitation, Definitions;
- B. Special Conditions.

1.02 QUALITY ASSURANCE

- A. For products or workmanship specified by association, trade, or Federal Standards, Contractor shall comply with requirements of the standard, except when more rigid requirements are specified in the Contract Documents, or are required by applicable codes.
- B. Contractor shall conform to current reference standard publication date in effect on the date of bid opening.
- C. Contractor shall obtain copies of standards unless specifically required not to by the Contract Documents.
- D. Contractor shall maintain a copy of all standards at jobsite during submittals, planning, and progress of the specific Work, until final completion, unless specifically required not to by the Contract Documents.
- E. Should specified reference standards conflict with Contract Documents, Contractor shall request clarification from the District and/or the Architect before proceeding.
- F. The contractual relationship of the parties to the Contract shall not be altered from the contractual relationship as indicated in the Contract Documents by mention or inference otherwise in any referenced document.
- G. Governing Codes shall be as shown in the Contract Documents including, without limitation, the Specifications.

END OF DOCUMENT

REFERENCES**PART 1 - GENERAL****1.01 SCHEDULE OF REFERENCES:**

The following information is intended only for the general assistance of the Contractor, and the District does not represent that all of the information is current. It is the Contractor's responsibility to verify the correct information for each of the entities listed.

AA	The Aluminum Association 1400 Crystal Drive, Suite 430 Arlington, VA 22202 www.aluminum.org	703/358-2960
AABC	Associated Air Balance Council 2401 Pennsylvania Avenue NW, Suite 330 Washington, DC 20037 www.aabc.com	202/737-0202
AASHTO	American Association of State Highway and Transportation Officials 555 12th St. NW - Suite 1000 Washington, DC 20004 www.transportation.org	202/624-5800
AATCC	American Association of Textile Chemists and Colorists P.O. Box 12215 Research Triangle Park, NC 27709-2215 www.aatcc.org	919/549-8141
ACA	American Coatings Association 901 New York Ave., NW, Suite 300 West Washington, DC 20001 www.paint.org	202/462-6272
ACI	American Concrete Institute 38800 Country Club Dr. Farmington Hills, MI 48331-3439 www.concrete.org	248/848-3800
ACPA	American Concrete Pipe Association 5605 N. MacArthur Blvd., Suite 340 Irving, TX 75038 www.concrete-pipe.org	972/506-7216

ADC	Air Duct Council 1901 N. Roselle Road, Suite 800 Schaumburg, IL 60195 www.flexibleduct.org	847/706-6750
AF&PA	American Forest and Paper Association 1101 K Street, NW, Suite 700 Washington, DC 20005 www.afandpa.org	202/463-2700
AGA	American Gas Association 400 North Capitol Street, NW, Suite 450 Washington, DC 20001 www.aga.org	202/824-7000
AGC	Associate General Contractors of America 2300 Wilson Blvd., Suite 300 Arlington, VA 22201 www.agc.org	703/548-3118
AHA	American Hardboard Association 1210 West Northwest Highway Palatine, IL 60067 http://domensino.com/AHA/default.htm	847/934-8800
AI	Asphalt Institute 2696 Research Park Drive Lexington, KY 40511-8480 www.asphaltinstitute.org	859/288-4960
AIA	The American Institute of Architects 1735 New York Ave., NW Washington, DC 20006-5292 www.aia.org	202/626-7300
AISC	American Institute of Steel Construction 130 East Randolph Street, Suite 2000 Chicago, IL 60601 www.aisc.org	312.670.2400
AISI	American Iron and Steel Institute 25 Massachusetts Ave., NW, Suite 800 Washington, DC 20001 www.steel.org	202/452-7100
AITC	American Institute of Timber Construction 1010 South 336th Street, #210 Federal Way, WA 98003-7394 https://www.plib.org/aitc/	253/835-3344

ALI	Associated Laboratories, Inc. P.O. Box 152837 Dallas, TX 75315 www.assoc-labs.com	214/565-0593
ALSC	American Lumber Standards Committee, Inc. 7470 New Technology Way, Suite F Frederick, MD 21703 www.alsc.org	301/972-1700
AMCA	Air Movement and Control Association International, Inc. 30 W. University Drive Arlington Heights, IL 60004 www.amca.org	847/394-0150
AMPP (formerly SSPC)	Association for Materials Protection and Performance (merger of Society for Protective Coatings and National Association of Corrosion Engineers International) (formerly Steel Structures Painting Council) 800 Trumbull Drive Pittsburgh, PA 15205 www.sspc.org	412/281-2331 877/281-7772
ANLA	AmericanHort (merger of American Nursery & Landscape Association and OFA – The Association of Horticultural Professionals) 2130 Stella Court Columbus, OH 43215 www.americanhort.org	614/487-1117
ANSI	American National Standards Institute 1899 L Street, NW, 11th Floor Washington, DC 20036 www.ansi.org	202/293-8020
APA	APA-The Engineered Wood Association 7011 S. 19th Street Tacoma, WA 98466-5333 www.apawood.org	253/565-6600

APA	Architectural Precast Association 325 John Knox Rd, Suite L-103 Tallahassee, FL 32303 www.archprecast.org	850/205-5637
APCIA	American Property Casualty Insurance Association (merger of American Insurance Association (formerly the National Board of Fire Underwriters) with the Property Casualty Insurers Association of America) 555 12th St, NW, Suite 550 Washington DC 20004 www.apci.org	202/828-7100
AHRI	Air Conditioning and Refrigeration Institute (now Air-Conditioning, Heating, & Refrigeration Institute) 2311 Wilson Blvd, Suite 400 Arlington, VA 22201 www.ahrinet.org	703/524-8800
ARMA	Asphalt Roofing Manufacturers Association 2331 Rock Spring Road Forest Hill, MD 21050 www.asphaltroofing.org	443/640-1075
ASA	The Acoustical Society of America Suite 300 1305 Walt Whitman Road Melville, NY 11747-4300 https://acousticalsociety.org/	516/576-2360
ASCE	American Society of Civil Engineers 1801 Alexander Bell Drive Reston, VA 20191 www.asce.org	800/548-2723 703/295-6300
ASHRAE	American Society of Heating, Refrigerating and Air Conditioning Engineers 180 Technology Parkway Peachtree Corners, GA 30092 www.ashrae.org	800/527-4723 404/636-8400
ASLA	American Society of Landscape Architects 636 Eye Street, NW Washington, DC 20001-3736 www.asla.org	202/898-2444
ASME	American Society of Mechanical Engineers Two Park Avenue New York, NY 10016-5990 www.asme.org	800/834-2763

ASPE	American Society of Plumbing Engineers 6400 Shafer Court, Suite 350 Rosemont, IL 60018 http://aspe.org	847/296-0002
ASQ	American Society for Quality P.O. Box 3005 Milwaukee, WI 53201-3005 or 600 North Plankinton Avenue Milwaukee, WI 53203 http://asq.org	800/248-1946 414/272-8575
ASSE	American Society of Sanitary Engineering 18927 Hickory Creek Dr., Suite 220 Mokena, IL 60448 www.asse-plumbing.org	708/995-3019
ASTM	ASTM International 100 Barr Harbor Drive PO Box C700 West Conshohocken, PA, 19428-2959 www.astm.org	610/832-9500
AWCI	Association of the Wall and Ceiling Industry 513 West Broad Street, Suite 210 Falls Church, VA 22046 www.awci.org	703/538-1600
AWPA	American Wood Protection Association (formerly American Wood Preservers Institute) P.O. Box 361784 Birmingham, AL 35236-1784 www.awpa.com	205/733-4077
AWS	American Welding Society 8669 NW 36 Street, Suite 130 Miami, FL 33166 www.aws.org	800/443-9353 305/443-9353
AWI	Architectural Woodwork Institute 46179 Westlake Drive, Suite 120 Potomac Falls, VA 20165-5874 www.awinet.org	571/323-3636
AWWA	American Water Works Association 6666 West Quincy Avenue Denver, CO 80235 www.awwa.org	800/926-7337 303/794-7711

BHMA	Builders Hardware Manufacturers Association 355 Lexington Avenue, 15th Floor New York, NY 10017 www.buildershardware.com	212/297-2122
BIA	The Brick Industry Association 12007 Sunrise Valley Drive, Suite 430 Reston, VA 20191 www.gobrick.com	703/620-0010
CGA	Compressed Gas Association 8484 Westpark Drive, Suite 220 McLean, VA 22102 www.cganet.com	703/788-2700
CISCA	Ceilings & Interior Systems Construction Association 1010 Jorie Blvd, Suite 30 Oak Brook, IL 60523 www.cisca.org	630/584-1919
CISPI	Cast Iron Soil Pipe Institute 2401 Fieldcrest Dr. Mundelein, IL 60060 www.cispi.org	224/864-2910
CLFMI	Chain Link Fence Manufacturers Institute 10015 Old Columbia Road, Suite B-215 Columbia, MD 21046 chainlinkinfo.org	301/596-2583
CPA	Composite Panel Association 19465 Deerfield Avenue, Suite 306 Leesburg, VA 20176 www.compositepanel.org	703/724-1128
CPSC	Consumer Product Safety Commission 4330 East-West Highway Bethesda, MD 20814 www.cpsc.gov	800/638-2772
CRA	California Redwood Association 818 Grayson Road, Suite 201 Pleasant Hill, CA 94523 www.calredwood.org	925/935-1499

CRI	Carpet and Rug Institute 100 S. Hamilton Street Dalton, GA 30722-2048 www.carpet-rug.org	706/278-3176
CRSI	Concrete Reinforcing Steel Institute 933 N. Plum Grove Road Schaumburg, IL 60173-4758 www.crsi.org	847/517-1200
CSI	The Construction Specifications Institute 123 North Pitt St, Suite 450 Alexandria, VA 22314 www.csinet.org	800/689-2900
CTIOA	Ceramic Tile Institute of America 12061 Jefferson Blvd. Culver City, CA 90230-6219 www.ctioa.org	310/574-7800
DHA	Decorative Hardwoods Association (formerly Hardwood Plywood & Veneer Association) 42777 Trade West Dr. Sterling, VA 20166 https://www.decorativehardwoods.org/	703/435-2900
DHI	Door and Hardware Institute (formerly National Builders Hardware Association) 2001 K Street NW, 3rd Floor North Washington, DC 20006 www.dhi.org	202/367-1134
DIPRA	Ductile Iron Pipe Research Association P.O. Box 190306 Birmingham, AL 35219 www.dipra.org	205/402-8700
DOC	U.S. Department of Commerce 1401 Constitution Ave., NW Washington, DC 20230 www.commerce.gov	202/482-2000
DOT	U.S. Department of Transportation 1200 New Jersey Avenue, SE Washington, DC 20590 www.dot.gov	855/368-4200
EJMA	Expansion Joint Manufacturers Association, Inc. 25 North Broadway Tarrytown, NY 10591 www.ejma.org	914/332-0040

EPA	Environmental Protection Agency Ariel Rios Building 1200 Pennsylvania Avenue, N.W. Washington, DC 20460 www.epa.gov	202/272-0167
FCICA	Floor Covering Installation Contractors Association 800 Roosevelt Rd., Bldg. C, Suite 312 Glen Ellyn, IL 60137 www.fcica.com	630/672-3702
FGIA	Fenestration and Glazing Industry Alliance 1900 E Golf Rd, Suite 1250 Schaumburg, IL 60173 https://fgiaonline.org/	847/303-5664
FM Global	Factory Mutual Insurance Company Amy Daley Global Practice Leader – Education, Public Entities, Health Care FM Global 270 Central Avenue Johnston, RI 02919-4949 www.fmglobal.com	401/275-3000 401/275-3029
FS	General Services Administration (GSA) Index of Federal Specifications, Standards and Commercial Item Descriptions 470 East L'Enfant Plaza, SW, Suite 8100 Washington, DC 20407 www.gsa.gov	202/619-8925
GA	The Gypsum Association 962 Wayne Ave., Suite 620 Silver Spring, MD 20910 www.gypsum.org	301/277-8686
HMA	Hardwood Manufacturers Association One Williamsburg Place, Suite 108 Warrendale, PA 15086 http://hmamembers.org	412/244-0440

IAPMO	International Association of Plumbing and Mechanical Officials (formerly the Western Plumbing Officials Association) 4755 E. Philadelphia St. Ontario, CA 91761 www.iapmo.org	909/472-4100
ICC	International Code Council 500 New Jersey Avenue, NW, 6th Floor Washington, DC 20001 www.iccsafe.org	888/422-7233
IEEE	Institute of Electrical and Electronics Engineers 3 Park Avenue, 17th Floor New York, NY 10016-5997 www.ieee.org	212/419-7900
IES	Illuminating Engineering Society 120 Wall Street, Floor 17 New York, NY 10005-4001 www.ies.org	212/248-5000
ITRK	Intertek Testing Services 3933 US Route 11 Cortland, NY 13045 www.intertek.com	607/753-6711
MCAA	Mechanical Contractors Association of America 1385 Piccard Drive Rockville, MD 20850 www.mcaa.org	301/869-5800
MMPA (formerly WMMPA)	Moulding & Millwork Producers Association (formerly Wood Moulding & Millwork Producers Association) 507 First Street Woodland, CA 95695 www.wmmpa.com	530/661-9591 800/550-7889
MSS	Manufacturers Standardization Society (MSS) of the Valve and Fittings Industry, Inc. 127 Park Street, NE Vienna, VA 22180-4602 http://mss-hq.org	703/281-6613
NAAMM	National Association of Architectural Metal Manufacturers 800 Roosevelt Rd. Bldg. C, Suite 312 Glen Ellyn, IL 60137 www.naamm.org	630/942-6591

NAIMA	North American Insulation Manufacturers Association P.O. Box 1906 Alexandria, VA 22313 https://insulationinstitute.org/	703/684-0084
NALP	National Association of Landscape Professionals (formerly Professional Landcare Network) 12500 Fair Lakes Circle, Suite 200 Fairfax, VA 22033 https://www.landscapeprofessionals.org/	703/736-9666
NAPA	National Asphalt Pavement Association 6406 Ivy Lane, Suite 350 Greenbelt, MD 20770-1441 www.asphaltpavement.org	888/468-6499 301/731-4748
NCSPA	National Corrugated Steel Pipe Association 14070 Proton Road, Suite 100 Dallas, TX 75244 www.ncspa.org	972/850-1907
NCMA	National Concrete Masonry Association 13750 Sunrise Valley Drive Herndon, VA 20171-4662 www.ncma.org	703/713-1900
NEBB	National Environmental Balancing Bureau 8575 Grovemont Circle Gaithersburg, MD 20877 www.nebb.org	301/977-3698
NECA	National Electrical Contractors Association 1201 Pennsylvania Ave. NW Washington, D.C., 20004 www.necanet.org	202/991-6300
NEMA	National Electrical Manufacturers Association 1300 North 17th Street N, Suite 900 Rosslyn, VA 22209 www.nema.org	703/841-3200
NEII	National Elevator Industry, Inc. 5537 SW Urish Road Topeka, KS 66610 https://nationalelevatorindustry.org/	703/589-9985
NFPA	National Fire Protection Association 1 Batterymarch Park Quincy, MA 02169-7471 www.nfpa.org	800/344-3555 855/274-8525

NGA (formerly GANA)	National Glass Association (merged with Glass Association of North America) 1945 Old Gallows Road Suite 750 Vienna, VA 22182 www.glass.org	866/342-5642 Ext 127
NHLA	National Hardwood Lumber Association PO Box 34518 Memphis, TN 38184 www.nhla.com	901/377-1818
NIA	National Insulation Association 516 Herndon Pkwy., Ste. D Herndon, VA 20170 www.insulation.org	703/464-6422
NRCA	National Roofing Contractors Association 10255 W. Higgins Road, Suite 600 Rosemont, IL 60018-5607 www.nrca.net	847/299-9070
NSF	NSF International 789 N. Dixboro Road Ann Arbor, MI 48113-0140 www.nsf.org	800/673-6275 734/769-8010
NSI	Natural Stone Institute (formerly Marble Institute of America) 380 E. Lorain St. Oberlin, OH 44074 https://www.naturalstoneinstitute.org/	440/250-9222
NTMA	National Terrazzo and Mosaic Association 209 N. Crockett Street, Suite 2 PO Box 2605 Fredericksburg, TX 78624 www.ntma.com	800/323-9736
OSHA	Occupational Safety and Health Act U.S. Department of Labor Occupational Safety & Health Administration 200 Constitution Ave., NW Washington, DC 20210 www.osha.gov	800/321-OSHA (6742)

PCA	Portland Cement Association 5420 Old Orchard Road Skokie, IL 60077 or 200 Massachusetts Ave NW, Suite 200 Washington, DC 20001 www.cement.org	847/966-6200 202/408-9494
PCA	Painting Contractors Association (formerly Painting and Decorating Contractors of America) 2316 Millpark Drive Maryland Heights, MO 63043 https://www.pcapainted.org/	800/322-7322
PCI	Precast/Prestressed Concrete Institute 8770 W. Bryn Mawr Ave., Suite 1150 Chicago, IL 60631 www.pci.org	312/786-0300
PDI	Plumbing & Drainage Institute 800 Turnpike Street, Suite 300 North Andover, MA 01845 http://pdionline.org	978/557-0720 800/589-8956
PEI	Porcelain Enamel Institute, Inc. P.O. Box 920220 Norcross, GA 30010 www.porcelainenamel.com	770/676-9366
PG&E	Pacific Gas & Electric Company P.O. Box 997300 Sacramento, CA 95899-7300 www.pge.com	800/743-5000
PLIB	Pacific Lumber Inspection Bureau (formerly West Coast Lumber Inspection Bureau) 1010 South 336th Street, Suite 210 Federal Way, WA 98003-7394 https://www.plib.org/	253/835-3344
RFCI	Resilient Floor Covering Institute 115 Broad Street, Suite 201 La Grange, GA 30240 www.rfci.com	706/882-3833
SDI	Steel Deck Institute P.O. Box 426 Glenshaw, PA 15116 www.sdi.org	412/487-3325

SDI	Steel Door Institute 30200 Detroit Road Westlake, OH 44145 www.steeldoor.org	440/899-0010
SJI	Steel Joist Institute 140 West Evans Street, Suite 203 Florence, SC 29501 http://steeljoist.org	843/407-4091
SMA	Stucco Manufacturers Association 5753 E Santa Ana Cyn Rd, #G-156 Anaheim, CA 92807 www.stuccomfgassoc.com	714/473-9579
SMACNA	Sheet Metal and Air Conditioning Contractors' National Association 4201 Lafayette Center Drive Chantilly, VA 20151-1219 www.smacna.org	703/803-2980
SPI	SPI: The Plastics Industry Trade Association, Inc. 1425 K St. NW, Suite 500 Washington, DC 20005 www.plasticsindustry.org	202/974-5200
TCA	The Tile Council of North America 100 Clemson Research Blvd. Anderson, SC 29625 www.tcnatile.com	864/646-8453
TPI	Truss Plate Institute 2670 Crain Highway, Suite 203 Waldorf, MD 20601 www.tpinst.org	240/587-5582
TPI	Turfgrass Producers International 444 E. Roosevelt Road #346 Lombard, IL 60148 www.turfgrasssod.org	800/405-8873 847/649-5555
TCIA	Tree Care Industry Association (formerly the National Arborist Association) 670 N Commercial Street, Suite 201 Manchester, NH 03101 www.tcia.org	603/314-5380 800/733-2622

TVI	The Vermiculite Institute c/o The Schundler Company 10 Central Street Nahant, MA 01908 www.vermiculiteinstitute.org	732/287-2244
UL	Underwriters Laboratories Inc. 333 Pfingsten Road Northbrook, IL 60062-2096 www.ul.com	847/272-8800 877/854-3577
UNI	Uni-Bell PVC Pipe Association 201 E. John Carpenter Freeway, Suite 750 Irving, TX 75062 www.uni-bell.org	972/243-3902
USDA	U.S. Department of Agriculture 1400 Independence Ave., S.W. Washington, DC 20250 www.usda.gov	202/720-2791
WA	Wallcoverings Association 35 E Wacker Dr., Suite 850 Chicago, IL 60601 www.wallcoverings.org	312/224-2574
WCMA	Window Covering Manufacturers Association 355 Lexington Avenue 15th Floor New York, NY 10017 www.wcmanet.org	212/297-2122
WDMA	Window & Door Manufacturers Association 2001 K Street NW, 3rd Floor North Washington, D.C. 20006 www.wdma.com	202/367-1157
WI	Woodwork Institute 1455 Response Road, Suite 110 Sacramento, CA 95815 www.wicnet.org	916/372-9943
WRI	Wire Reinforcement Institute 942 Main Street, Suite 300 Hartford, CT 06103 www.wirereinforcementinstitute.org	860/240-9545
WWCA	Western Wall & Ceiling Contractors Association 1910 N. Lime St. Orange, CA 92865 www.wwcca.org	714/221-5520

WWPA	Western Wood Products Association (formerly Redwood Inspection Service) 1500 SW First Ave., Suite 870 Portland, OR 97201 www.wwpa.org	503/224-3930
------	--	--------------

PART 2 - PRODUCTS Not Used.

PART 3 - EXECUTION Not Used.

END OF DOCUMENT

MATERIALS AND EQUIPMENT

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Purchase of Materials and Equipment;
- B. Special Conditions;
- C. Imported Materials Certification.

1.02 MATERIAL AND EQUIPMENT

- A. Only items approved by the District and/or Design Professional shall be used.
- B. Contractor shall submit lists of products and other product information in accordance with the Contract Documents, including, without limitation, the provisions regarding the submittals.

1.03 MATERIAL AND EQUIPMENT COLORS

- A. The District and/or Architect will provide a schedule of colors.
- B. No individual color selections will be made until after approval of all pertinent materials and equipment and after receipt of appropriate samples in accordance with the Contract Documents, including, without limitation, the provisions regarding the submittals.
- C. Contractor shall request priority in writing for any item requiring advance ordering to maintain the approved Construction Schedule.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. Contractor shall deliver manufactured materials in original packages, containers, or bundles (with seals unbroken), bearing name or identification mark of manufacturer.
- B. Contractor shall deliver fabrications in as large assemblies as practicable; where specified as shop-primed or shop-finished, package or crate as required to preserve such priming or finish intact and free from abrasion.
- C. Contractor shall store materials in such a manner as necessary to properly protect them from damage. Materials or equipment damaged by handling, weather, dirt, or from any other cause will not be accepted.

- D. Materials are not acceptable that have been warehoused for long periods of time, stored or transported in improper environment, improperly packaged, inadequately labeled, poorly protected, excessively shipped, deviated from normal distribution pattern, or reassembled.
- E. Contractor shall store material so as to cause no obstructions of sidewalks, roadways, access to the Site or buildings, and underground services. Contractor shall protect material and equipment furnished under Contract.
- F. Contractor may store materials on Site with prior written approval by the District, all material shall remain under Contractor's control and Contractor shall remain liable for any damage to the materials. Should the Project Site not have storage area available, the Contractor shall provide for off-site storage at a bonded warehouse and with appropriate insurance coverage at no cost to District.
- G. When any room in Project is used as a shop or storeroom, the Contractor shall be responsible for any repairs, patching, or cleaning necessary due to that use. Location of storage space shall be subject to prior written approval by District.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Manufacturers listed in various sections of Contract Documents are names of those manufacturers that are believed to be capable of supplying one or more of items specified therein.
- B. The listing of a manufacturer does not imply that every product of that manufacturer is acceptable as meeting the requirements of the Contract Documents.

2.02 FACILITIES AND EQUIPMENT

Contractor shall provide, install, maintain, and operate a complete and adequate facility for handling, the execution, disposal, and distribution of material and equipment as required for proper and timely performance of Work connected with Contract.

2.03 MATERIAL REFERENCE STANDARDS

Where material is specified solely by reference to "standard specifications" and if requested by District, Contractor shall submit for review data on actual material proposed to be incorporated into Work of Contract listing name and address of vendor, manufacturer, or producer, and trade or brand names of those materials, and data substantiating compliance with standard specifications.

PART 3 - EXECUTION

3.01 WORKMANSHIP

- A. Where not more specifically described in any other Contract Documents, workmanship shall conform to methods and operations of best standards and accepted practices of trade or trades involved and shall include items of fabrication, construction, or installation regularly furnished or required for completion (including finish and for successful operation, as intended).
- B. Work shall be executed by tradespersons skilled in their respective lines of Work. When completed, parts shall have been durably and substantially built and present a neat appearance.

3.02 COORDINATION

- A. Contractor shall coordinate installation of Work so as to not interfere with installation of others. Adjustment or rework because of Contractor's failure to coordinate will be at no additional cost to District.
- B. Contractor shall examine in-place work for readiness, completeness, fitness to be concealed or to receive other work, and in compliance with Contract Documents. Concealing or covering Work constitutes acceptance of additional cost which will result should in-place Work be found unsuitable for receiving other Work or otherwise deviating from the requirements of the Contract Documents.

3.03 COMPLETENESS

Contractor shall provide all portions of the Work, unless clearly stated otherwise, installed complete and operational with all elements, accessories, anchorages, utility connections, etc., in manner to assure well-balanced performance, in accordance with manufacturer's recommendations and by Contract Documents. Terms such as "installed complete," "operable condition," "for use intended," "connected to all utilities," "terminate with proper cap," "adequately anchored," "patch and refinish," "to match similar," should be assumed to apply in all cases, except where completeness of functional or operable condition is specifically stated as not required.

3.04 APPROVED INSTALLER OR APPLICATOR

Installation by a manufacturer's approved installer or applicator is an understood part of Specifications and only approved installer or applicator is to provide on-site Work where specified manufacturer has on-going program of approving (i.e. certifying, bonding, re-warranting) installers or applicators. Newly established relationships between a manufacturer and an installer or applicator who does not have other approved applicator work in progress or completed is not approved for this Project.

3.05 MANUFACTURER'S RECOMMENDATIONS

All installations shall be in accordance with manufacturer's published recommendations and specific written directions of manufacturer's representative.

Should Contract Documents differ from recommendations of manufacturer or directions of his representative, Contractor shall analyze differences, make recommendations to the District and the Architect in writing, and shall not proceed until interpretation or clarification has been issued by the District and/or the Architect.

END OF DOCUMENT

QUALITY CONTROL

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Inspector, Inspections and Tests, Uncovering of Work and Non-conforming of Work and Correction of Work;
- B. Special Conditions.

1.02 RELATED CODES:

- A. The Work is governed by requirements of Title 24, California Code of Regulations ("CCR"), and the Contractor shall keep a copy of these available at the job Site for ready reference during construction.
- B. The Division of the State Architect ("DSA") shall be notified at or before the start of construction.

1.03 OBSERVATION AND SUPERVISION:

- A. The District and Architect or their appointed representatives will review the Work and the Contractor shall provide facilities and access to the Work at all times as required to facilitate this review. Administration by the Architect and any consulting Structural Engineer will be in accordance with applicable regulations, including, without limitation, CCR, Part 1, Title 24, Section 4-341.
- B. One or more Project Inspector(s) approved by DSA and employed by or in contract with the District, referred to hereinafter as the "Project Inspector", will observe the work in accordance with CCR, Part 1, Title 24, Sections 4-333(b) and 4-342:
 - (1) The Project Inspector and Special Inspector(s) shall have access to the Work wherever it is in preparation or progress for ascertaining that the Work is in accordance with the Contract Documents and all applicable code sections. The Contractor shall provide facilities and operation of equipment as needed, and access as required and shall provide assistance for sampling or measuring materials.
 - (2) The Project Inspector will notify the District and Architect and call the attention of the Contractor to any observed failure of Work or material to conform to Contract Documents.

The Contractor shall conform with all applicable laws as indicated in the Contract Documents, including, without limitation, to CCR, Part 1, Title 24, Section 4-343.

The Contractor shall supervise and direct the Work and maintain a competent superintendent on the job who is authorized to act in all matters pertaining to the Work. The Contractor's superintendent shall also inspect all materials, as they arrive, for compliance with the Contract Documents. Contractor shall reject defective Work or materials immediately upon delivery or failure of the Work or material to comply with the Contract Documents. The Contractor shall submit verified reports as indicated in the Contract Documents, including, without limitation, the Specifications and as required by Part 1, Title 24, Section 4-336.

1.04 TESTING AGENCIES:

- A. Testing agencies and tests shall be in conformance with the General Documents and the requirements of Part 1, Title 24, Section 4- 335.
- B. Testing and inspection in connection with earthwork shall be under the direction of the District's consulting soils engineer, if any, referred to hereinafter as the "Soils Engineer."
- C. Testing and inspection of construction materials and workmanship shall be performed by a qualified laboratory, referred to hereinafter as the "Testing Laboratory." The Testing Laboratory shall be under direction of an engineer registered in the State of California, shall conform to requirements of ASTM E329, and shall be employed by or in contract with the District.
- D. Testing laboratory shall be approved by the Architect and the Division of the State Architect.
- E. Owner will employ and pay for services of an independent testing labatory to perform specified inspection and testing. Retesting cost for failed test will be Contractors responsibilityand will be back-charged against the contract.

1.05 TESTS AND INSPECTIONS:

- A. The Contractor shall be responsible for notifying the District and Project Inspector of all required tests and inspections. Contractor shall notify the District and Project Inspector at least seventy-two hours (72) hours in advance of performing any Work requiring testing or inspection.
- B. The Contractor shall provide access to Work to be tested and furnish incidental labor, equipment, and facilities to facilitate all inspections and tests.
- C. The District will pay for first inspections and tests required by the "CCR", and other inspections or tests that the District and/or the Architect may direct to have made, including the following principal items:
 - (1) Tests and observations for earthwork and paving.
 - (2) Tests for concrete mix designs, including tests of trial batches.
 - (3) Tests and inspections for structural steel work.
 - (4) Field tests for framing lumber moisture content.

- (5) Additional tests directed by the District that establish that materials and installation comply with the Contract Documents.
 - (6) Tests and observations of welding and expansion anchors.
- D. The District may at its discretion, pay and then back charge the Contractor for:
 - (1) Retests or reinspections, if required, and tests or inspections required due to Contractor error or lack of required identifications of material.
 - (2) Uncovering of work in accordance with Contract Documents.
 - (3) Testing done on weekends, holidays, and overtime will be chargeable to the Contractor for the overtime portion.
 - (4) Testing done off Site.
- E. Testing and inspection reports and certifications:
 - (1) If initially received by Contractor, Contractor shall provide to each of the following a copy of the agency or laboratory report of each test or inspection or certification.
 - (a) The District;
 - (b) The Construction Manager, if any;
 - (c) The Architect;
 - (d) The Consulting Engineer, if any;
 - (e) Other engineers on the Project, as appropriate;
 - (f) The Project Inspector; and
 - (g) The Contractor.
 - (2) When the test or inspection is one required by the CCR, a copy of the report shall also be provided to the DSA.

1.06 LABORATORY REPORTS

- A. After each inspection and test, promptly submit two copies of laboratory report to Owner, Architect, Contractor and DSA.
- B. Include:
 - (1) Date of issue,
 - (2) DSA Application and File numbers,
 - (3) Project title and number,

- (4) Name of inspector,
- (5) Date and time of sampling or inspection,
- (6) Identification of product and Specification Section,
- (7) Location in the Project,
- (8) Type of inspection or test,
- (9) Date of test,
- (10) Results of test,
- (11) Conformance with Contract Documents.

C. When requested by Architect, provide interpretation of test results.

1.07 LIMITS ON TESTING LABORATORY AUTHORITY

- A. Laboratory may not release, revoke, alter or enlarge on requirements of Contract Documents.
- B. Laboratory may not approve or accept any portion of the work.
- C. Laboratory may not assume any duties of Contractor.
- D. Laboratory has no authority to stop the work.

PART 2 - PRODUCTS

2.01 TYPE OF TEST AND INSPECTIONS

- A. Testing and inspection shall be in accordance with DSA Form 103 (or current version)
- B. Slump Test
ASTM C 143
- C. Concrete Tests

Testing agency shall test concrete used in the work per the following paragraphs:

- (1) Compressive Strength:
 - (a) Minimum number of tests required: One (1) set of three (3) cylinders for each 100 cubic yards (Sec. 2604(h) 01) of concrete or major fraction thereof, placed in one (1) day. See Title 24, Section 2605(g).

- (b) Two cylinders of each set shall be tested at twenty-eight (28) days. One (1) cylinder shall be held in reserve and tested only when directed by the Architect or District.
- (c) Concrete shall test the minimum ultimate compressive strength in twenty-eight 28 days, as specified on the structural drawings.
- (d) In the event that the twenty-eight (28) day test falls below the minimum specified strength, the effective concrete in place shall be tested by taking cores in accordance with UBC Standard No. 26-13 and tested as required for cylinders.
- (e) In the event that the test on core specimens falls below the minimum specified strength, the concrete will be deemed defective and shall be removed and replaced upon such direction of the Architect, and in a manner acceptable to the Division of the State Architect.

D. Reinforcing, Steel

PART 3 - EXECUTION Not Used.

END OF DOCUMENT

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Administrative and procedural requirements related to inspections, tests, and related quality control procedures required to be performed by the Contractor and that facilitate the Contractor's compliance with the Contract Documents.

1.2 RELATED REQUIREMENTS

- A. Section 01 3300, Submittal Procedures; submission of manufacturers' instructions and certificates.
- B. Section 01 4523, Testing and Inspecting Services, and DSA 103; Special Tests and Inspections required by authorities having jurisdiction and are the responsibility of Owner.
- C. Section 01 7700, Closeout Procedures.
- D. Specific requirements for testing, inspections, mockups, and other quality control requirements as described in the various Sections of the Specifications.

1.3 DEFINITIONS

- A. Experienced: When used with an entity or individual, and unless otherwise specified, means having successfully completed a minimum of three previous projects similar in nature, size, and extent to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.
- B. Field Quality-Control Tests: Tests and inspections that are performed on-site for installation of the Work and for completed Work.
- C. Installer/Applicator/Erector: Contractor or another entity engaged by Contractor as an employee, subcontractor, or sub-subcontractor, to perform a particular construction operation, including installation, erection, application, assembly, and similar operations.
- D. Mockups: Full-size, physical assemblies that are constructed on-site and in-place mockups to demonstrate aesthetic effects and, where indicated, qualities of materials and execution, and to review construction, coordination, interface, testing, and operation of various building components. Mockups are not samples.
- E. Tests: Procedures intended to establish the quality, performance, or reliability of a product or system conducted by a qualified Testing Agency.
- F. Source Quality-Control Tests: Tests and inspections related to materials manufactured or fabricated away from the jobsite that will be incorporated into the work.

FIELD QUALITY CONTROL PROCEDURES
SECTION 01 4516
3595001

- G. Testing Agency: An independent entity engaged to perform specific tests, inspections, or both, is qualified to operate in California, and meets the additional requirements specified.
 - 1. Testing laboratory shall mean the same as Testing Agency.
- H. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.
- I. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that actual products incorporated into the Work and completed construction comply with requirements. Contractor's quality-control services do not include Contract administration activities performed by Architect.

1.4 REFERENCES AND STANDARD SPECIFICATIONS

- A. General:
 - 1. The Contract Documents contain references to various standard specifications, codes, practices, and requirements for materials, work quality, installation, inspections, and tests published and issued by the organizations, societies, and associations.
 - 2. Contractor shall obtain its own copies of required specified referenced publications.
 - 3. The specification or standard referred to shall have full force and effect as though printed in these Specifications.
 - 4. When the effective date of a reference standard is not specified, it shall be understood that the current edition or latest revision thereof and any amendments or supplements thereto in effect on the date of the DSA approval, shall govern the Work.
 - 5. The contractual relationships, duties, and responsibilities of the parties in Contract or those of the Architect shall not be altered from the Contract Documents by mention or inference otherwise in any reference document.
- B. Products or workmanship specified by association, trade, or other consensus standards shall comply with requirements of the referenced standard or specification except when more rigid requirements are specified or are required by applicable codes.
- C. Conflicting Requirements:
 - 1. If compliance with two or more standards or requirements are specified and the standards or requirements establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement.
 - 2. Refer conflicting requirements that are different, but apparently equal, to Architect for direction before proceeding.

1.5 ADMINISTRATIVE REQUIREMENTS

- A. Submittal Procedures:
 - 1. Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
 - 2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.

1.6 INFORMATIONAL SUBMITTALS

- A. Schedule of Tests and Inspections.
- B. Field Superintendent's Quality Control Responsibilities
- C. Procedures for inspection prior to subsequent Work or cover up.
- D. Qualifications of Contractor's Testing Agencies.
- E. Certified copies of Reports and Documents.

1.7 CLOSEOUT SUBMITTALS

- A. Permits, Licenses, and Certificates: Copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents established for compliance with standards and regulations bearing on performance of the Work.
- B. Test and Inspection Log including final record for each test and inspection as specified in Part 3 and in accordance with Section 01 7839, Project Record Documents.

1.8 REPORTS AND DOCUMENTS

- A. Test and Inspection Reports: Prepare and submit certified written reports where specified in the Specification Sections. Include the following:
 - 1. Date of issue.
 - 2. Project title and number.
 - 3. Name, address, and telephone number of testing agency.
 - 4. Dates and locations of samples and tests or inspections.
 - 5. Names of individuals making tests and inspections.
 - 6. Description of the Work and test and inspection method.
 - 7. Identification of product and Specification Section.
 - 8. Complete test or inspection data.
 - 9. Test and inspection results and an interpretation of test results.
 - 10. Record of temperature and weather conditions at time of sample taking and testing and inspecting.

FIELD QUALITY CONTROL PROCEDURES
SECTION 01 4516
3595001

11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
12. Name and signature of laboratory inspector.
13. Recommendations on retesting and re-inspecting.

1.9 QUALITY ASSURANCE

- A. Minimum Quantity or Quality Levels:
1. The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements.
 2. Refer uncertainties to Architect for a decision before proceeding.
- B. Use of trade-specific terminology in referring to a trade or entity does not require that certain construction activities be performed by accredited or unionized individuals, or that requirements specified apply exclusively to specific trade(s).
- C. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce Work of specified quality.
- D. Correct conditions or workmanship not in conformance with specified standards or quality. Do so immediately after non-conformance item is discovered or within a reasonable time frame agreed upon with Construction Manager.
- E. Comply with manufacturers' instructions, including each step in sequence. Should manufacturers' instructions conflict with Contract Documents, request clarification from the Architect before proceeding.
- F. Comply with specified standards as minimum quality for the Work, except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.
- G. Perform Work by persons qualified to produce required and specified quality.
- H. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, or disfigurement.
- I. Upon delivery to the jobsite, materials and products shall be inspected for compliance with the Project Specifications.
1. Nonconforming materials, products, equipment, hardware, tools and/or safety devices shall be removed immediately from the general work area and stored within a secured area approved by the Owner as "NON CONFORMING MATERIALS AREA" to ensure that defective or nonconforming materials are not incorporated into or used on the project
 2. Materials or products shall not be removed from the designated area until they are deemed by the Architect to be in compliance, or until they are modified or fixed to

meet the project specifications, or until they are removed from the jobsite for the purposes of disposal or shipment back to the manufacturer.

1.10 CONTRACTORS TESTING AGENCY

- A. Qualifications: At Contractor's expense, provide an independent testing laboratory nationally recognized according to 29 CFR 1910.7 and accredited according to NIST's National Voluntary Laboratory Accreditation Program (NVLAP,) or other independent agency with the experience and capability to conduct testing and inspecting indicated, documented according to ASTM E329; with additional qualifications specified in individual Sections; and, where required, that is acceptable to authorities having jurisdiction.
- B. Testing Agency shall cooperate with Architect, Construction Manager, Owner's Project Inspector, and Contractor in performance of duties.
- C. Testing Agency shall provide qualified personnel to perform required tests and inspections.
- D. Testing Agency shall not be authorized to release, revoke, alter, or increase the Contract Document requirements, approve or accept any portion of the Work, or perform any duties of Contractor.

1.11 TESTS AND INSPECTIONS

- A. Preconstruction Testing: Where preconstruction testing is specified to verify performance requirements, comply with the following as applicable:
 - 1. Contractor Responsibilities:
 - a. Provide test specimens representative of proposed products and construction.
 - b. Submit specimens in a timely manner with sufficient time for testing and analyzing results to prevent delaying the Work.
 - c. Provide sizes and configurations of test assemblies, mockups, and laboratory mockups to adequately demonstrate capability of products to comply with performance requirements.
 - d. Build site-assembled test assemblies and mockups using installers who will perform same tasks for Project.
 - e. Build laboratory mockups at testing facility using personnel, products, and methods of construction indicated for the completed Work.
 - f. When testing is complete, remove test specimens, assemblies, and mockups; do not reuse products on Project unless approved by Architect in writing.
- B. Tests and Inspections indicated in individual Specification Sections shall be conducted by a qualified Testing Agency. The responsibilities of the Testing Agency shall be as follows:

FIELD QUALITY CONTROL PROCEDURES
SECTION 01 4516
3595001

1. Verifying that manufacturer maintains detailed fabrication and quality-control procedures and reviews the completeness and adequacy of those procedures to perform the Work.
 2. Notifying Architect, Construction Manager, Owner's Project Inspector, and Contractor promptly of irregularities and deficiencies observed in the Work during performance of its services.
 3. Submit a certified written report of each test, inspection, and similar quality-control service to Architect, Construction Manager, and Owner's Project Inspector with copy to Contractor and to DSA.
 4. Submit a final report of tests and inspections at Substantial Completion which includes a list of unresolved deficiencies.
 5. Interpret tests and inspections and stating in each report whether tested and inspected work complies with or deviates from the Contract Documents.
 6. Retest and reinspect corrected work.
- C. Monitoring and Documentation: Contractor shall maintain testing and inspection reports including log of approved and rejected results as specified in Part 3.
1. Include work Architect has indicated as nonconforming or defective.
 2. Indicate corrective actions taken to bring nonconforming work into compliance with requirements.
 3. Comply with requirements of the California Division of the State Architect (DSA).

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 NOTIFICATIONS

- A. Contractor shall provide the following notifications;
1. Owner's Project Inspector writing:
 - a. 24 hours in advance of starting new Work
 - b. 24 hours in advance of each test or inspection
 2. 48 hours' prior notice, minimum, to the Testing Agency for required tests and inspections.

3.2 TEST AND INSPECTION FIELD BINDER

- A. Contractor shall maintain in the Field Office a Test and Inspection Field Binder that includes a hard copy of the following documents:
1. Approved Quality Control Plan.
 2. Specification Sections that apply to the respective portions of work.
 3. RFI's, CCD's or other approved document that changes the work.

4. Manufacturer's Installation Instructions (MII).
5. Specific details of the Work as requested by the Inspector.
6. Test and Inspection Log.

3.3 TEST AND INSPECTION LOG

- A. Prepare and maintain a record of tests and inspections using an electronic spreadsheet.
- B. Include the following information:
 1. Date test or inspection was conducted.
 2. Description of the Work tested or inspected.
 3. List pertinent detail/sheet number.
 4. List pertinent Specification Section.
 5. Attach manufacturer's installation inspections if applicable.
 6. List and attach RFI's, ASI's or CCD's affecting the Work.
 7. Date Inspector verified work is acceptable.
- C. Final record for each test and inspection shall be submitted on Contractors letterhead and include the name of the responsible person to verify Work was in accordance with the approved Contract Documents.

3.4 MANUFACTURERS' FIELD SERVICES

- A. When specified in respective Specification Sections, Contractor shall require supplier or manufacturer to provide qualified personnel to observe field conditions, conditions of surfaces and installation, quality of workmanship, start-up of equipment, testing, adjusting and balancing of equipment as applicable, and to make appropriate recommendations. Contractor is responsible for proper notification of manufacturer's representative before installation of applicable work and for obtaining necessary inspection certificate stating that installation was observed and approved.
- B. Product Performance Verification: The supplier of products specified based on performance criteria shall, at the request of the Agency, inspect the installed product and certify conformance of the product to specified criteria under the installed conditions.
- C. Manufacturer's representative shall submit written report to the Architect listing observations and recommendations.

3.5 TOLERANCES - GENERAL

- A. Monitor tolerance control of installed products or portions to produce acceptable Work. Do not permit tolerances to accumulate.
- B. Comply with manufacturers' tolerances. Should manufacturers' tolerances conflict with Contract Documents, request clarification from Architect before proceeding.
- C. Adjust products to appropriate dimensions; position before securing products in place.

FIELD QUALITY CONTROL PROCEDURES
SECTION 01 4516
3595001

3.6 DIMENSIONING AND TOLERANCES FOR ACCESSIBILITY

- A. While it is recognized that construction practices generally permit a level of reasonable dimensional tolerance, the installation of items subject to compliance with the Americans with Disabilities Act Accessibility Guidelines and Chapter 11B of the California Building Code, typically does not allow such tolerances. Therefore, these dimensions are to be considered absolute and will be strictly enforced. Items found to be out of tolerance may require modification and/or replacement at Contractor's expense.

3.7 REPAIR AND PROTECTION

- A. On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.
 - 1. Provide materials and comply with installation requirements specified in other Specification Sections or matching existing substrates and finishes.
 - 2. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible. Comply with the Contract Document requirements for cutting and patching in Section 01 7329, Cutting and Patching.
- B. Protect construction exposed by or for quality-control service activities.
- C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

END OF SECTION

p:\sacramento\3595 tracy unified school district\001-000_villalovoz es new shade structures\08 specifications\06 spec\04 final\freiler - shade struct\01 4516_field quality control procedures.docx
Last Updated: August 28, 2020

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Requirements for Testing Laboratory.
 - 2. Contractor's responsibilities for facilitation of Testing and Inspections.

1.2 RELATED SECTIONS AND DOCUMENTS

- A. Geologic Hazards & Soils Report.
- B. DSA 103 - Structural Test & Inspections List.
- C. Section 13 3423, Relocatable Buildings.
- D. Division 23, Mechanical Work - Testing, adjusting, and balancing of systems.
- E. Section 31 0000, Earthwork.
- F. Individual Specification Sections: Inspections and tests required, and standards for testing.

1.3 REFERENCES

- A. California Administrative Code (CAC), edition as noted on the drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Building Code (CBC), edition as noted on the drawings, as adopted by the California Division of the State Architect (DSA).

1.4 SELECTION AND PAYMENT

- A. Testing laboratory shall be approved by both the Architect and the Division of the State Architect.
- B. Owner will employ and pay for services of an independent testing laboratory to perform specified inspection and testing. Retesting costs for failed tests will be the Contractors responsibility and will be back-charged against the contract.
- C. Under provisions for Relocatable Building construction, Owner limits his exposure to in-plant inspection and testing costs. Refer to other Specification Sections related to such specific construction.
- D. Employment of testing laboratory shall in no way relieve Contractor of obligation to perform work in accordance with requirements of Contract Documents.

TESTING AND INSPECTION SERVICES

SECTION 01 4523

3595001

1.5 LABORATORY REPORTS

- A. After each inspection and test, promptly submit two copies of laboratory report to Owner, Architect, Contractor and DSA.
- B. Include:
 - 1. Date of issue,
 - 2. DSA Application and File numbers,
 - 3. Project title and number,
 - 4. Name of inspector,
 - 5. Date and time of sampling or inspection,
 - 6. Identification of product and Specification Section,
 - 7. Location in the Project,
 - 8. Type of inspection or test,
 - 9. Date of test,
 - 10. Results of test,
 - 11. Conformance with Contract Documents.
- C. When requested by Architect, provide interpretation of test results.

1.6 LIMITS ON TESTING LABORATORY AUTHORITY

- A. Laboratory may not release, revoke, alter or enlarge on requirements of Contract Documents.
- B. Laboratory may not approve or accept any portion of the work.
- C. Laboratory may not assume any duties of Contractor.
- D. Laboratory has no authority to stop the work.

1.7 CONTRACTOR RESPONSIBILITIES

- A. Deliver to laboratory at designated location, adequate samples of materials proposed to be used which require testing, along with proposed mix designs. Allow reasonable time for review and testing.
- B. Arrange for, and coordinate with, laboratory for all required testing and inspection. Provide adequate notice, in advance, for proper scheduling and processing of testing. The Inspector will not be responsible for scheduling or arranging for testing and inspection services.
- C. Cooperate with laboratory personnel, and provide access to the work and to manufacturer's facilities.
- D. Provide incidental labor and facilities to provide access to work to be tested, to obtain and handle samples at the site or at the source of products to be tested, to facilitate tests and inspections, storage and curing of test samples.

TESTING AND INSPECTION SERVICES

SECTION 01 4523

3595001

- E. Notify Architect, Inspector, Structural Engineer (when applicable) and laboratory 24 hours prior to expected time for operations requiring inspection and testing services.

END OF SECTION

*p:\sacramento\3595 tracy unified school district\001-000_villalovoz es new shade structures\08 specifications\06 spec\04 final\freiler
- shade struct\01 4523_testing and inspection services.docx
Last Updated: December 16, 2021*

TEMPORARY FACILITIES AND CONTROLS

PART 1 – GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions;
- B. Special Conditions;
- C. Site Standards; and
- D. Construction Waste Management and Disposal.

1.02 TEMPORARY UTILITIES:

A. Electric Power and Lighting:

- (1) Contractor will pay for power during the course of the Work. To the extent power is available in the building(s) or on the Site, Contractor may use the District's existing utilities by making prearranged payments to the District for the utilities used by Contractor and all Subcontractors. Contractor shall be responsible for providing temporary facilities required to deliver that power service from its existing location in the building(s) or on the Site to point of intended use.
- (2) Contractor shall verify characteristics of power available in building(s) or on the Site. Contractor shall take all actions required to make modifications where power of higher voltage or different phases of current are required. Contractor shall be fully responsible for providing that service and shall pay all costs required therefor.
- (3) Contractor shall furnish, wire for, install, and maintain temporary electrical lights wherever it is necessary to provide illumination for the proper performance and/or observation of the Work: a minimum of 20 foot-candles for rough work and 50 foot-candles for finish work.
- (4) Contractor shall be responsible for maintaining existing lighting levels in the project vicinity should temporary outages or service interruptions occur.

B. Water:

- (1) Contractor shall pay for water used during the course of the Work. Contractor shall coordinate and pay for installation or use of water meter in compliance with local water agency requirements. To the

extent water is then available in the building(s) or on the Site, Contractor may use the District's existing utilities by making prearranged payments to the District for the utilities used by Contractor and all Subcontractors. Contractor shall be responsible for providing temporary facilities required to deliver such utility service from its existing location in the building(s), on the Site, or other location approved by the local water agency, to point of intended use.

- (2) Contractor shall use backflow preventers on water lines at point of connection to District's water supply. Backflow preventers shall comply with requirements of Uniform Plumbing Code.
- (3) Contractor shall make potable water available for human consumption.

C. Sanitary Facilities:

- (1) Contractor shall provide sanitary temporary facilities in no fewer numbers than required by law and such additional facilities as may be directed by the Inspector for the use of all workers. The facilities shall be maintained in a sanitary condition at all times and shall be left at the Site until removal is directed by the Inspector or Contractor completes all other work at the Site.
- (2) Use of toilet facilities in the Work under construction shall not be permitted except by consent of the Inspector and the District.

D. Fire Protection:

- (1) Contractor shall provide and maintain fire extinguishers and other equipment for fire protection. Such equipment shall be designated for use for fire protection only and shall comply with all requirements of the California Fire, State Fire Marshall and/or its designee.
- (2) Where on-site welding and burning of steel is unavoidable, Contractor shall provide protection for adjacent surfaces.

E. Trash Removal:

- (1) Contractor shall provide trash removal on a timely basis. Under no circumstance shall Contractor use District trash service.

F. Field Office:

- (1) If Contractor chooses to provide a field office, it shall be an acceptable construction trailer that is well-lit and ventilated. The construction trailer shall be equipped with shelves, desks, filing cabinet, chairs, and such other items of equipment needed. Trailer and equipment are the property of the Contractor and must be removed from the Site upon completion of the Work.
- (2) Contractor shall provide any additional electric lighting and power required for the trailer. Contractor shall make adequate provisions for heating and cooling as required.

1.03 CONSTRUCTION AIDS:

- A. Plant and Equipment:
 - (1) Contractor shall furnish, operate, and maintain a complete plant for fabricating, handling, conveying, installing, and erecting materials and equipment; and for conveyances for transporting workers. Include elevators, hoists, debris chutes, and other equipment, tools, and appliances necessary for performance of the Work.
 - (2) Contractor shall maintain plant and equipment in safe and efficient operating condition. Damages due to defective plant and equipment, and uses made thereof, shall be repaired by Contractor at no expense to the District.
- B. None of the District's tools and equipment shall be used by Contractor for the performance of the Work.

1.04 BARRIERS AND ENCLOSURES:

- A. Contractor shall obtain the District's written permission for locations and types of temporary barriers and enclosures, including fire-rated materials proposed for use, prior to their installation.
- B. Contractor shall provide and maintain temporary enclosures to prevent public entry and to protect persons using other buildings and portions of the Site and/or Premises, the public, and workers. Contractor shall also protect the Work and existing facilities from the elements, and adjacent construction and improvements, persons, and trees and plants from damage and injury from demolition and construction operations.
- C. Contractor shall provide site access to existing facilities for persons using other buildings and portions of the Site, the public, and for deliveries and other services and activities.
- D. Tree and Plant Protection:
 - (1) Contractor shall preserve and protect existing trees and plants on the Premises that are not designated or required to be removed, and those adjacent to the Premises.
 - (2) Contractor shall provide barriers to a minimum height of 4'-0" around drip line of each tree and plant, around each group of trees and plants, as applicable, in the proximity of demolition and construction operations, or as denoted on the Plans.
 - (3) Contractor shall not park trucks, store materials, perform Work or cross over landscaped areas. Contractor shall not dispose of paint thinners, water from cleaning, plastering or concrete operations, or other deleterious materials in landscaped areas, storm drain systems, or sewers. Plant materials damaged as a result of the performance of the Work shall, at the option of the District and at Contractor's expense, either be replaced with new plant materials equal in size to

those damaged or by payment of an amount representing the value of the damaged materials as determined by the District.

- (4) Contractor shall remove soil that has been contaminated during the performance of the Work by oil, solvents, and other materials which could be harmful to trees and plants, and replace with good soil, at Contractor's expense.
- (5) Excavation around Trees:
 - (a) Excavation within drip lines of trees shall be done only where absolutely necessary and with written permission from the District.
 - (b) Where trenching for utilities is required within drip lines, tunneling under and around roots shall be by hand digging and shall be approved by the District. Main lateral roots and taproots shall not be cut. All roots 2 inches in diameter and larger shall be tunneled under and heavily wrapped with wet burlap so as to prevent scarring or excessive drying. Smaller roots that interfere with installation of new work may be cut with prior approval by the District. Roots must first be cut with a Vermeer, or equivalent, root cutter prior to any trenching.
 - (c) Where excavation for new construction is required within drip line of trees, hand excavation shall be employed to minimize damage to root system. Roots shall be relocated in backfill areas wherever possible. If encountered immediately adjacent to location of new construction, roots shall be cut approximately 6 inches back from new construction.
 - (d) Approved excavations shall be carefully backfilled with the excavated materials approved for backfilling. Backfill shall conform to adjacent grades without dips, sunken areas, humps, or other surface irregularities. Do not use mechanical equipment to compact backfill. Tamp carefully using hand tools, refilling and tamping until Final Acceptance as necessary to offset settlement.
 - (e) Exposed roots shall not be allowed to dry out before permanent backfill is placed. Temporary earth cover shall be provided, or roots shall be wrapped with four layers of wet, untreated burlap and temporarily supported and protected from damage until permanently relocated and covered with backfill.
 - (f) Accidentally broken roots should be sawed cleanly 3 inches behind ragged end.

1.05 SECURITY:

The Contractor shall be responsible for project security for materials, tools, equipment, supplies, and completed and partially completed Work.

1.06 TEMPORARY CONTROLS:

A. Noise Control:

- (1) Contractor acknowledges that adjacent facilities may remain in operation during all or a portion of the Work period, and it shall take all reasonable precautions to minimize noise as required by applicable laws and the Contract Documents.
- (2) Notice of proposed noisy operations, including without limitation, operation of pneumatic demolition tools, concrete saws, and other equipment, shall be submitted to the District a minimum of forty-eight (48) hours in advance of their performance.

B. Noise and Vibration:

- (1) Equipment and impact tools shall have intake and exhaust mufflers.
- (2) Contractor shall cooperate with District to minimize and/or cease the use of noisy and vibratory equipment if that equipment becomes objectionable by its longevity.

C. Dust and Dirt:

- (1) Contractor shall conduct demolition and construction operations to minimize the generation of dust and dirt, and prevent dust and dirt from interfering with the progress of the Work and from accumulating in the Work and adjacent areas including, without limitation, occupied facilities.
- (2) Contractor shall periodically water exterior demolition and construction areas to minimize the generation of dust and dirt.
- (3) Contractor shall ensure that all hauling equipment and trucks carrying loads of soil and debris shall have their loads sprayed with water or covered with tarpaulins, and as otherwise required by local and state ordinance.
- (4) Contractor shall prevent dust and dirt from accumulating on walks, roadways, parking areas, and planting, and from washing into sewer and storm drain lines.

D. Water:

- (1) Contractor shall not permit surface and subsurface water, and other liquids, to accumulate in or about the vicinity of the Premises. Should accumulation develop, Contractor shall control the water or other liquid, and suitably dispose of it by means of temporary pumps, piping, drainage lines, troughs, ditches, dams, or other methods.

E. Pollution:

- (1) No burning of refuse, debris, or other materials shall be permitted on or in the vicinity of the Premises.
- (2) Contractor shall comply with applicable regulatory requirements and anti-pollution ordinances during the conduct of the Work including, without limitation, demolition, construction, and disposal operations.

F. Lighting:

- (1) If portable lights are used after dark, all light must be located so as not to direct light into neighboring property.

1.07 PUBLICITY RELEASES:

- A. Contractor shall not release any information, story, photograph, plan, or drawing relating information about the Project to anyone, including press and other public communications medium, including, without limitation, on website(s) without the written permission of the District.

PART 2 – PRODUCTS Not used.

PART 3 – EXECUTION Not used.

END OF DOCUMENT

CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions;
- B. Special Conditions; and
- C. Temporary Facilities and Controls.

1.02 SECTION INCLUDES:

- A. Administrative and procedural requirements for the following:
 - (1) Salvaging non-hazardous construction waste.
 - (2) Recycling non-hazardous construction waste.
 - (3) Disposing of non-hazardous construction waste.

1.03 DEFINITIONS:

- A. Construction Waste: Building and site improvement materials and other solid waste resulting from construction, remodeling, renovation, or repair operations. Construction waste includes packaging.
- B. Demolition Waste: Building and site improvement materials resulting from demolition or selective demolition operations.
- C. Disposal: Removal off-site of demolition and construction waste and subsequent sale, recycling, reuse, or deposit in landfill or incinerator acceptable to authorities having jurisdiction.
- D. Recycle: Recovery of demolition or construction waste for subsequent processing in preparation for reuse.
- E. Salvage: Recovery of demolition or construction waste and subsequent sale or reuse in another facility.
- F. Salvage and Reuse: Recovery of demolition or construction waste and subsequent incorporation into the Work.

1.04 PERFORMANCE REQUIREMENTS:

- A. General: Develop waste management plan that results in end-of Project rates for salvage/recycling of sixty-five percent (65%) by weight (or by volume, but not a combination) of total waste generated by the Work.

1.05 SUBMITTALS:

- A. Waste Management Plan: Submit waste management plan within 30 days of date established for commencement of the Work.
- B. Waste Reduction Progress Reports: Concurrent with each Application for Payment, submit copies of report. Include the following information:
 - (1) Material category.
 - (2) Generation point of waste.
 - (3) Total quantity of waste in tons or cubic yards.
 - (4) Quantity of waste salvaged, both estimated and actual in tons or cubic yards.
 - (5) Quantity of waste recycled, both estimated and actual in tons or cubic yards.
 - (6) Total quantity of waste recovered (salvaged plus recycled) in tons or cubic yards.
 - (7) Total quantity of waste recovered (salvaged plus recycled) as a percentage of total waste.
- C. Waste Reduction Calculations: Before request for final payment, submit copies of calculated end-of-Project rates for salvage, recycling, and disposal as a percentage of total waste generated by the Work.
- D. Records of Donations: Indicate receipt and acceptance of salvageable waste donated to individuals and organizations. Indicate whether organization is tax exempt.
- E. Records of Sales: Indicate receipt and acceptance of salvageable waste sold to individuals and organizations. Indicate whether organization is tax exempt.
- F. Recycling and Processing Facility Records: Indicate receipt and acceptance of recyclable waste by recycling and processing facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.
- G. Landfill and Incinerator Disposal Records: Indicate receipt and acceptance of waste by landfills and incinerator facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.

- H. Qualification Data: For Waste Management Coordinator.
- I. Submittal procedures and quantities are specified in Document 01 33 00.

1.06 QUALITY ASSURANCE:

- A. Waste Management Coordinator Qualifications: LEED Accredited Professional by U.S. Green Building Council.
- B. Regulatory Requirements: Comply with hauling and disposal regulations of authorities having jurisdiction.
- C. Waste Management Conference: Conduct conference at Project site to comply with requirements. Review methods and procedures related to waste management including, but not limited to, the following:
 - (1) Review and discuss waste management plan including responsibilities of Waste Management Coordinator.
 - (2) Review requirements for documenting quantities of each type of waste and its disposition.
 - (3) Review and finalize procedures for materials separation and verify availability of containers and bins needed to avoid delays.
 - (4) Review procedures for periodic waste collection and transportation to recycling and disposal facilities.
 - (5) Review waste management requirements for each trade.

1.07 WASTE MANAGEMENT PLAN:

- A. General: Develop plan consisting of waste identification, waste reduction work plan, and cost/revenue analysis. Indicate quantities by weight or volume, but use same units of measurement throughout waste management plan.
- B. Waste Identification: Indicate anticipated types and quantities of site-clearing and construction waste generated by the Work. Include estimated quantities and assumptions for estimates.
- C. Waste Reduction Work Plan: List each type of waste and whether it will be salvaged, recycled, or disposed of in landfill or incinerator. Include points of waste generation, total quantity of each type of waste, quantity for each means of recovery, and handling and transportation procedures.
 - (1) Salvaged Materials for Reuse: For materials that will be salvaged and reused in this Project, describe methods for preparing salvaged materials before incorporation into the Work.

- (2) Salvaged Materials for Sale: For materials that will be sold to individuals and organizations, include list of their names, addresses, and telephone numbers.
- (3) Salvaged Materials for Donation: For materials that will be donated to individuals and organizations, include list of their names, addresses, and telephone numbers.
- (4) Recycled Materials: Include list of local receivers and processors and type of recycled materials each will accept. Include names, addresses, and telephone numbers.
- (5) Disposed Materials: Indicate how and where materials will be disposed of. Include name, address, and telephone number of each landfill and incinerator facility.
- (6) Handling and Transportation Procedures: Include method that will be used for separating recyclable waste including sizes of containers, container labeling, and designated location on Project site where materials separation will be located.

PART 2 - PRODUCTS Not Used.

PART 3 - EXECUTION

3.01 PLAN IMPLEMENTATION:

- A. General: Implement approved waste management plan. Provide handling, containers, storage, signage, transportation, and other items as required to implement waste management plan during the entire duration of the Contract.
 - (1) Comply with Document 01 50 00 for operation, termination, and removal requirements.
- B. Training: Train workers, subcontractors, and suppliers on proper waste management procedures, as appropriate for the Work occurring at Project site.
 - (1) Distribute waste management plan to everyone concerned within 3 days of submittal return.
 - (2) Distribute waste management plan to entities when they first begin work on site. Review plan procedures and locations established for salvage, recycling, and disposal.
- C. Site Access and Temporary Controls: Conduct waste management operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.

- (1) Designate and label specific areas of Project site necessary for separating materials that are to be salvaged, recycled, reused, donated, and sold.
- (2) Comply with Document 01 50 00 for controlling dust and dirt, environmental protection, and noise control.

3.02 RECYCLING CONSTRUCTION WASTE:

- A. General: Recycle paper and beverage containers used by on-site workers.
- B. Recycling Incentives: Revenues, savings, rebates, tax credits, and other incentives received for recycling waste materials shall accrue to the Contractor.
- C. Procedures: Separate recyclable waste from other waste materials, trash, and debris. Separate recyclable waste by type at Project site to the maximum extent practical.
 - (1) Provide appropriately marked containers or bins for controlling recyclable waste until they are removed from Project Site. Include list of acceptable and unacceptable materials at each container and bin.
 - (a) Inspect containers and bins for contamination and remove contaminated materials if found.
 - (2) Stockpile processed materials on site without intermixing with other materials. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
 - (3) Stockpile materials away from construction area. Do not store within drip line of remaining trees.
 - (4) Store components off the ground and protect from the weather.
 - (5) Remove recyclable waste off District property and transport to recycling receiver or processor.
- D. Packaging:
 - (1) Cardboard and Boxes: Break down packaging into flat sheets. Bundle and store in a dry location.
 - (2) Polystyrene Packaging: Separate and bag material.
 - (3) Pallets: As much as possible, require deliveries using pallets to remove pallets from Project Site. For pallets that remain on Site, break down pallets into component wood pieces and comply with requirements for recycling wood.
 - (4) Crates: Break down crates into component wood pieces and comply with requirements for recycling wood.

- E. Site-Clearing Wastes: Chip brush, branches, and trees on site.
- F. Wood Materials:
 - (1) Clean Cut-Offs of Lumber: Grind or chip into small pieces.
 - (2) Clean Sawdust: Bag sawdust that does not contain painted or treated wood.

3.03 DISPOSAL OF WASTE:

- A. General: Except for items or materials to be salvaged, recycled, or otherwise reused, remove waste materials from Project Site and legally dispose of them in a landfill or incinerator acceptable to authorities having jurisdiction.
 - (1) Except as otherwise specified, do not allow waste materials that are to be disposed of accumulate on site.
 - (2) Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
- B. Burning: Do not burn waste materials.
- C. Disposal: Transport waste materials off District property and legally dispose of them.

END OF DOCUMENT

FIELD OFFICES

PART 1 – GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions;
- B. Special Conditions; and
- C. Temporary Facilities and Controls.

1.02 SECTION INCLUDES:

- A. Requirements for Field Offices and Field Office Trailers.

1.03 SUMMARY:

- A. General: Contractor shall provide District's Field Office Trailer and contents, for District's use exclusively, during the term of the Contract.
- B. Property: Trailer, furniture, furnishings, equipment, and the like, supplied by the Contractor with the Office Trailer shall remain the property of the Contractor; District property items installed, delivered, and the like by District within the Office Trailer will remain District's property.
- C. Modifications: District reserves the right to modify the trailer or contents, or both, as may be deemed proper by District.
- D. Condition: Trailer and contents shall be clean, neat, substantially finished, in good, proper, and safe condition for use, operation, and the like; the trailer and contents shall not be required to be new.
- E. Installation Timing: Provide safe, fully furnished, functional, proper, complete, and finished trailer properly ready for entire use, within fourteen (14) calendar days of District's notification of the issuance of Notice to Proceed.

1.04 SUBMITTALS:

- A. General: Submit submittals to District in quantity, format, type, and the like, as specified herein.
- B. Office Trailer Data: One (1) copy of manufacturer's descriptive data, technical descriptions, regulatory compliance, industry standards, installation, removal, and maintenance instructions.

- C. Equipment Data: Two (2) copies of manufacturer data for each type of equipment, if directed by District.
- D. Furniture and Furnishings Data: Two (2) copies of manufacturer data for each type of equipment, if directed by District.
- E. Plans: One (1) reproducible copy of appropriately scaled plans of trailer layout. Plans shall include, but not be limited to: lighting; furniture; equipment; telephone and electrical outlets; and the like.
- F. Product Samples: One (1) complete and entire unit of each type, if directed by District.

1.05 QUALITY ASSURANCE

- A. Standards: In the event that provisions of codes, regulations, safety orders, Contract Documents, referenced manufacturer's specifications, manufacturer's instructions, industry standards, and the like, are in conflict, the more restrictive and higher quality shall govern.
- B. Installer: Installer or Installers engaged by Contractor must have a minimum of five (5) years of documented and properly authenticated successful experience of specialization in the installation of the items or systems, or both, specified herein.
- C. Manufacturer: Contractor shall obtain products from nationally and industry recognized Manufacturer with five (5) years minimum, of immediately recent, continuous, documented and properly authenticated successful experience of specialization in the manufacture of the product specified herein.
- D. State Personnel Training: Provide proper training for maintenance and operations, including emergency procedures, and the like, as directed by District.
- E. Units: Shall be sound and free of defects, and shall not include any damage or defect that will impair the safety, installation, performance, or the durability of the entire Office Trailer and appurtenant systems.

1.06 REGULATORY REQUIREMENTS

- A. General: Work shall be executed in accordance with applicable Codes, Regulations, Statutes, Enactments, Rulings, Laws, each authority having jurisdiction, and including, but not limited to, Regulatory Requirements specified herein.
- B. California Building Standards Code ("CBSC").
- C. California Code of Regulations, Title 25, Chapter 3, Sub Chapter 2, Article 3 ("CCR").
- D. Coach Insignia: Trailer shall display California Commercial Coach Insignia; such insignia shall be deemed to show that the trailer is in accordance with the Construction and Fire Safety requirements of CCR.

PART 2 – PRODUCTS

2.01 FIELD OFFICE TRAILER

- A. General: Provide entire Field Office Trailer of type, function, operation, capacity, size, complete with controls, safety devices, accessories, and the like, for proper and durable installation. Partitions, walls, ceiling, and other interior and exterior surfaces shall be appropriately finished, including, but not limited to, trim, painting, wall base, floor covering, suspended or similar ceiling, and the like; provide systems, components, units, nuts, bolts, screws, anchoring devices, fastening devices, washers, accessories, adhesives, sealants, and other items of type, grade, and class required for the particular use, not identified but required for a complete, weather-tight, appropriately operating, and finished installation.
- B. Manufacturers: General Electric Capital Modular Space; The Space Place, Inc.; or equal.
- C. Program: Provide a wheel-mounted trailer with stairs, landings, platforms, ramps, and the like, in good, proper, safe, clean, and properly finished condition; with proper heavy duty locks, and other proper and effective security at all doors, windows, and the like. Trailer shall be maintained in good, proper, safe, clean, and properly finished condition during the Contract.
 - (1) Nominal Trailer Size: Four hundred eighty (480) square feet, minimum.
 - (2) Stairs, Platform: Properly finished stairs, platforms, and ramps.
 - (3) Doors: Two (2), three (3) foot wide exterior doors with locksets; finished ramp, steps, and entry platform at each exterior door.
 - (4) Keys: Submit five (5) keys for each door, window, furniture unit, and the like. There shall be no other key copies or originals available; each key shall be identified for District; and shall be labeled, or tagged
 - (5) Lighting: Sixty-five (65) foot-candles illumination minimum at any point, at thirty (30) inches above finished floor throughout from fluorescent light source, exclusively, or as directed by District.
 - (6) Electrical Outlets: One (1) duplex outlet evenly spaced every twelve (12) linear horizontal feet of wall face, and electrical service ready for use.

2.02 FIELD OFFICE TRAILER ITEMS

- A. General: Provide the Field Office Trailer with the following arranged into two (2) workstations:
 - (1) Desks: Two (2) desks: thirty-six (36) inches by sixty (60) inches; steel, laminated plastic top; locking, one (1) or two (2) file drawers single pedestal; steel; provide five (5) keys to District.

- (2) Tables: Two (2) tables; thirty-six (36) inches by sixty (60) inches; twenty-nine (29) inches high; steel, laminated plastic top tables; one (1) at each desk.
 - (3) Chairs: Two (2) chairs: swivel; steel; with seat cushion and arms; one (1) at each desk.
 - (4) Waste Baskets: Two (2) waste baskets, one at each desk.
- B. Furniture and Equipment: Provide in the space located to effect efficient and logical use.
- (1) File cabinet: One (1); four (4) drawer; lateral; steel locking.
 - (2) Plan Table: One (1) plan table: thirty-six (36) inches deep by seventy-two (72) inches wide by forty-two (42) inches high; adjustable; wood or steel; with lockable plan and pencil drawers.
 - (3) Drafting Stool: One (1) drafting stool; swiveling; steel; padded; adjustable; with footrest and casters.
 - (4) Bookshelf: One (1) bookshelf: thirty-six (36) inches deep by seventy-two (72) inches wide by forty-two (42) inches high; adjustable; wood or steel; with lockable plan and pencil drawer.
 - (5) Plan Rack: One (1) wheel mounted plan rack.
 - (6) Waste Baskets: One (1) large waste basket.
 - (7) Coat/Hat Hanger: Wall mounted with minimum capacity for four (4) garments and ten (10) hats.
 - (8) Document Management System: Shall include an integrated high-volume printer, copier, and facsimile machine, including stand, base, and storage cabinet; and shall include the following features:
 - (a) Type: Laser, dry electrostatic transfer, plain paper, digital, multi-function imaging system.
 - (b) Network: Ethernet or Token Ring network ready, Plug-and-Play.
 - (c) Print, send/receive facsimile from any connected workstation.
 - (d) Resolution: Six hundred (600) dots per inch by six hundred (600) dots per inch, minimum.
 - (e) Print Speed: Twenty (20) pages per minute, minimum.
 - (f) Copies: Twenty (20) copies per minute, minimum.
 - (g) Document Handler: Forty (40) sheet, minimum

- (h) Collator: Forty (40) bin, minimum, with stapling.
- (i) Duplexing: Capable.
- (j) Paper Size: Capable of handling paper sizes to eleven (11) inches by seventeen (17) inches.
- (k) Paper Cassettes: One (1) each for eight and one half (8.5) inches by eleven (11) inches, eight and one half (8.5) inches by fourteen (14) inches, and eleven (11) inches by seventeen (17) inches paper sizes; minimum two hundred fifty (250) sheets per cassette.
- (l) Reduction/Enlargement: Capable of reduction to twenty-five percent (25%) and enlargement to two hundred percent (200%).
- (m) Facsimile Electronic Storage: Capable of storing minimum of fifty (50) speed dial numbers, group faxing and broadcast faxing.
- (n) Facsimile Scanning: Capable of scanning into memory a minimum of one hundred (100) pages with maximum scan time of three (3) seconds per page.
- (o) Halftone: Sixty-four (64) levels.
- (p) Redial: Automatic and Manual.
- (9) Maintenance: Contractor shall purchase service agreements for each unit of equipment for the duration of the project plus two (2) months, and shall maintain all equipment in proper working condition. Service agreements shall include provision for replacement of toner cartridges and other items required to effect proper unit use. Service agreements shall also provide for:
 - (a) Unlimited Service Calls.
 - (b) Same Day Response.
 - (c) All parts, labor, preventative maintenance and mileage.
 - (d) All chemicals, such as toner, fixing agent, and the like.
 - (e) System training and setup.
- (10) Portable Toilets: Two (2); each shall include a urinal; each unit shall be a properly enclosed chemical unit conforming to ANSI Z4.3.
 - (a) Location: As directed by District.
 - (b) Maintenance: Maintain each unit and surrounding areas in a clean, hygienic and orderly manner, at all time. Empty, clean,

and sanitize each unit each day at a location and time as directed by District.

- (c) Removal: Relocate, or remove from the site, each Portable Toilet. Upon such directive by District, the Contractor shall forthwith relocate or remove each Portable Toilet and submit the affected areas to a condition which existed prior to the installation of each Portable Toilet, within three (3) calendar days, or as directed by District in writing, at no cost to District.

2.03 UTILITY AND SERVICES

- A. Telephone Service: Contractor shall provide and interface the entire telephone service, and shall properly and timely pay for telephone service for District's non-long-distance use.
- B. Electrical Service: Provide all proper connections and continuously pay for service for the duration of the Work.

2.04 FINISHES

- A. General: Manufacturer standard finish system over surfaces properly cleaned, pretreated, and prepared to obtain proper bond; all visible surfaces shall be coated.
- B. Finish: Color as selected by District from manufacturer standard palette.

PART 3 – EXECUTION

3.01 INSTALLATION

- A. General: Properly prepare area and affected items to receive the Work. Set Work accurately in location, alignment, and elevation; rigidly, securely, and firmly anchor to appropriate structure; install plumb, straight, square, level, true, without racking, rigidly anchored to proper solid blocking, substrate, and the like; provide appropriate type and quantity of reinforcements, fasteners, adhesives, self-adhesive and other tapes; lubricants, coatings, accessories, and the like, as required for a complete, structurally rigid, stable, sound, and appropriately finished installation, in accordance with manufacturer's published instructions, and as indicated. The more restrictive and higher quality requirement shall govern. Moving parts shall be properly secured, without binding, looseness, noise, and the like.
- B. Installation: Install in accordance with 25 CCR 3.2.3 and as directed by District; jack up trailer and level both ways; mount on proper concrete piers with all load off wheels; provide required tie down and accessories per Section 4368 of referenced CCR, and as directed by District.
- C. Rejected Work: Work, materials, unit, items, systems, and the like, not accepted by District shall be deemed rejected, and shall forthwith be removed and replaced with proper and new Work, materials, unit, items, systems, and the like at no cost to District.

- D. Standard: Comply with manufacturer's published instructions, or with instructions as shown or indicated; the more restrictive and higher quality requirement shall govern.
- E. Location: As directed by District.
- F. Fire Resistance: Construct and install in accordance with UL requirements.
- G. Maintenance: Contractor shall maintain trailer and adjacent areas in a safe, clean and hygienic condition throughout the duration of the Work, and as directed by District. Properly repair or replace furniture or other items, as directed by District. Properly remove unsafe, damaged, or broken furniture, or similar items, and replace with safe and proper items. Contractor shall pay cost of all services, repair, and maintenance, or replacement of each item.
- H. Janitorial Service: Provide professional janitorial services, including, but not limited to, trash, waste paper baskets, fill paper dispensers; clean and dust all furniture, files, and the like; sweep and mop resilient and similar flooring; and vacuum carpeting and similar flooring.
 - (1) Frequency: Two (2) times per week, minimum.
- I. Removal: Properly remove the Office Trailer and contents from the Site upon completion of the Contract, or as directed by District in writing. Forthwith properly patch and repair affected areas; replace damaged items with new items. Carefully and properly inventory, clean, pack, store, and protect District property; submit District property to District at a date, time and location as directed by District.

END OF DOCUMENT

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Protection for existing trees.
 - 2. Repair and replacement of damaged trees.

1.2 RELATED REQUIREMENTS

- A. Section 32 8000, Irrigation.
- B. Section 32 9000, Landscaping.

1.3 REFERENCES AND STANDARDS

- A. American National Standard Institute (ANSI) A300 Pruning Standards.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Submittal Procedures:
 - 1. Action Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
 - 2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.

1.5 ACTION SUBMITTALS

- A. Fenced Tree Protection Area Plan: Submit plan outlining trees listed by number to be protected and their groupings. Trees shall be grouped in their own Fenced Tree Protection Areas as shown in Drawings.
- B. Schedule of Activities Inside Tree Protection Area: Submit in writing a schedule, including any and all activity inside Fenced Tree Protection Areas. This schedule to include but not limited to the dates fences are initially installed, altered and dates of fence replacement. Intent of these provisions is that the Tree Protection Zones (TPZ) are fenced for the entire duration with only exceptions of short intervals or specifically defined construction activity needs. Revise schedule as directed.
- C. Mediation Plan: Submit mediation plan to keep existing trees and planting irrigated during construction.

1.6 CLOSEOUT SUBMITTALS

- A. Maintenance Plan: For replaced trees.

TEMPORARY TREE PROTECTION
SECTION 01 5639
3595001

PART 2 - PRODUCTS

2.1 GENERAL

- A. Use materials as specified; any deviation from the Specifications must first be approved by the Owner's Representative in writing.

2.2 MATERIALS

- A. Trunk Protection constructed of:
 - 1. 20-foot long 2x6 wood boards or length needed to protect the trunk if tree trunk is shorter than 20 feet in height.
 - 2. Metal wire. Gauge strong enough to tie the boards around the trunk of the tree.
- B. Tree Protection Zone Fencing:
 - 1. 6-foot-tall metal chain link construction fencing.
- C. Bark Mulch: Untreated, shredded cedar.

PART 3 - EXECUTION

3.1 GENERAL REQUIREMENTS FOR TREES BE RETAINED

- A. Maintain pre-existing moisture levels.
- B. Maintain areas inside the fenced tree protection area including lawn mowing, leaf removal, operation and repair of irrigation.
- C. Protect root systems from flooding, erosion, excessive watering and drying resulting from dewatering or other operations:
- D. Operations not Allowed:
 - 1. Run off or spillage of damaging materials in vicinity of root systems.
 - 2. Rinsing of tools or equipment under trees.
 - 3. Storage of materials, stockpile soil, park or drive vehicles within drip lines.
 - 4. Cutting, breaking skin or bark, or bruising roots or branches.
 - 5. Fires under and adjacent trees.
 - 6. Discharge exhaust under foliage.
 - 7. Securing cable, chain, or rope to trees.
 - 8. Change of grade within drip line of trees without Landscape Architect's approval.
 - 9. The use of lime.

3.2 TREE TRUNK PROTECTION

- A. Conform to requirements for trees to be retained, in accordance with article GENERAL REQUIREMENTS FOR TREES TO BE RETAINED.
- B. Install boards vertically around tree and bind together with wire to protect the bark 360 degrees around the entire tree prior to start of any demolition and construction. Boards are not to dig into bark.
- C. Major scaffold limbs may require plastic fencing to be wrapped around them for protection.

3.3 TREE DRIPLINE PROTECTION

- A. The Tree Protection Zone (TPZ) is a restricted area around the base of the tree with a radius of one foot (1') for every inch of tree trunk diameter or ten feet, which ever is greater, enclosed by 6' tall chain link fence unless otherwise directed.
- B. Signage designating the protection zone and penalties for violations shall be secured in prominent location on each protection fence.

3.4 TREE PROTECTION

- A. Duration: Tree protection shall be erected before demolition, grading, or any construction begins and remain in place until final inspection of the project.
- B. Conform to requirements for trees and plants to be retained, in accordance with article GENERAL REQUIREMENTS FOR TREES TO BE RETAINED.
- C. Construction shall not commence until approval of the Fenced Tree Protection Area Plan and Schedule of Activities Inside Tree Protection Area have been obtained from the Architect.
- D. Vehicle movement within the TPZ will only be allowed for construction equipment.
 - 1. Within dripline, apply 10-inch layer of mulch over geotextile fabric.
- E. Perform trenching operations within the TPZ of the tree so that:
 - 1. Digging shall be by hand using narrow trenching shovel.
 - 2. No roots larger than 2" diameter are cut and utilities are routed around or below them.
 - 3. Roots smaller than 2" diameter are cut with sharp tools, saws, loppers; not torn, chopped or broken.
- F. Where roots are exposed:
 - 1. Do not allow the roots to dry out.
 - 2. On the same day the excavation is made, provide temporary backfill to original grade at tree roots,

TEMPORARY TREE PROTECTION
SECTION 01 5639
3595001

- 3. Or cover roots with 4 layers of wet untreated burlap, made wet each day, including weekends.
- G. Roots larger than 3" in diameter are not to be cut without review and approval by an Arborist provided by Owner.

3.5 REPAIR AND REPLACEMENT OF TREES

- A. Repair or replace damaged trees as required or directed.
- B. Repair tress damaged by operations:
 - 1. within 24 hours of damage,
 - 2. to satisfaction of Landscape Architect,
 - 3. to ANSI A300 Pruning Standards.
- C. Replace repaired trees where repair has not restored them to health or aesthetics:
 - 1. within 6 months of request to replace,
 - 2. to the satisfaction of Landscape Architect,
 - 3. with replacement trees of a size and variety matching those that were removed,
- D. Replaced trees shall be maintained in good health and aesthetics for the duration of the project from installation.
 - 1. Submit comprehensive maintenance plan for replacement trees, including but not limited to provisions for irrigation system independent of existing system.
- E. Where suitable replacement of trees is not available:
 - 1. Submit affidavit to Landscape Architect that they are not available.
 - 2. Provide compensation to Owner at the following rates:
 - a. \$2000 for each caliper inch of tree removed under 12 inches.
 - b. \$4000 for each caliper inch of tree removed 12 inches or greater.
 - c. Caliper of trees measured at 6 inches above grade.
 - d. Caliper defined here as thickness of diameter, measured in inches.

3.6 SOIL CONTAMINATION

- A. Remove soil that has been contaminated during the performance of the Work by oil, solvents, and other materials which could be harmful to trees and plants.

TEMPORARY TREE PROTECTION
SECTION 01 5639
3595001

1. Replace with good soil in conformance with Section 31 0000, Earthwork, at Contractor's expense.

END OF SECTION

*p:\sacramento\3595 tracy unified school district\001-000_villalovoz es new shade structures\08 specifications\06 spec\04 final\freiler
- shade struct\01 5639_temporary tree protection.docx
New File: January 6, 2022*

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Requirements for preparing Storm Water Pollution Prevention Plan.

1.2 SCOPE OF WORK

A. General: Provide all materials, equipment and labor necessary to furnish and install straw wattles or silt fence barriers at locations shown on the Drawings and as required during construction.

B. The Contractor shall as a minimum address:

1. Cut and fill operations.
2. Temporary stockpiles.
3. Vehicle and equipment storage, maintenance and fueling operations.
4. Concrete, plaster, mortar and paint disposal.
5. Dust control.
6. Tracking of dirt, mud on off-site streets.
7. Pipe flushing.

1.3 ADMINISTRATIVE REQUIREMENTS

A. Submittal Procedures:

B. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures

1.4 QUALITY ASSURANCE

A. General: Comply with governing codes and regulations.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Straw Wattles: New manufactured straw roles in compliance with state requirements for sediment control.

B. Silt Fences: New manufactured silt fence in compliance with state requirements for sediment control.

C. Filter Bag: As required by local jurisdiction.

**EROSION CONTROL
SECTION 01 5713.10
3595001**

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Straw Wattles: Install per the drawings and/or as required.
- B. Silt Fences: Install per the Drawings and/or as required. Silt Fences shall not be used around inlets.
- C. Filter Bags: Installed as required by manufacturer's requirements.

3.2 MAINTENANCE AND REMOVAL:

- A. General: Maintain and repair existing and new erosion control facilities throughout the construction period. Remove silt build up at straw wattles and/or silt fences as needed. Repair damage to earth slopes and banks. Erosion control measures shall be left in place until final paving and landscaping are complete.
- B. Monitoring: Provide monitoring of erosion control measures before and after storm events.
- C. Cleaning: Keep area clean of debris.
- D. Remove erosion control measures prior to placing finish landscaping.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: VOC restrictions for product categories listed below under Article "DEFINITIONS" and in compliance with the following.
 - 1. California Code of Regulations, Title 24, Part 11 California Green Building Standards Code.
 - 2. Local Agency Division of the State Architect.
 - 3. No Rating System is applicable.
- B. Products of each category that are installed in the project must comply; applicable laws and ordinances do not allow for partial compliance.
- C. Listing of a product in these Specifications shall not be construed as a solicitation or requirement to use any product or combination of products in violation of the requirements of South Coast Air Quality Management District Rule No.1168, as described in Rule 1168(g).
 - 1. If a listed product does not meet the requirements of this rule, request approval for use of an alternate product by the same or another manufacturer meeting the requirements of this rule.
 - 2. Do not use products which do not meet the requirements of this rule.

1.2 RELATED REQUIREMENTS

- A. Divisions 01 through 33 contain related requirements specific to the work of each of these Sections. Requirements may or may not include reference to this Section.
- B. Section 01 8113, Sustainable Design Requirements, for CAL-Green general requirements and procedures.

1.3 REFERENCES

- A. California Green Building Standards Code (CALGreen), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. Low-Emitting Materials Product List; California Collaborative for High Performance Schools (CHPS); current edition at www.chps.net/.
- C. CRI (GLCC) - Green Label Testing Program - Approved Product Categories for Carpet Cushion; Carpet and Rug Institute; current edition.
- D. CRI (GLP) - Green Label Plus Carpet Testing Program - Approved Products; Carpet and Rug Institute; current edition.
- E. GEI (SCH) - GREENGUARD "Children and Schools" Certified Products; GREENGUARD Environmental Institute; current listings at www.greenguard.org.

VOLATILE ORGANIC COMPOUND (VOC) RESTRICTIONS

SECTION 01 6116.10

3595001

- F. GreenSeal GS-36 - Commercial Adhesives; Green Seal, Inc.
- G. SCAQMD 1168 - South Coast Air Quality Management District Rule No.1168; current edition; www.aqmd.gov.
- H. SCS (CPD) - SCS Certified Products; Scientific Certification Systems; current listings at www.scs-certified.com.

1.4 DEFINITIONS

- A. VOC-Restricted Products: Products of each of the following categories when installed or applied on-site:
 - 1. Adhesives, sealants, and sealer coatings, regardless of specification Section or Division.
 - 2. Paints and coatings.
 - 3. Carpet and resilient flooring.
 - 4. Composite wood products; plywood, particleboard, wood fiberboard.
- B. Adhesives: Gunnable, trowelable, liquid-applied, and aerosol adhesives, whether specified or not; including flooring adhesives, resilient base adhesives, and pipe jointing adhesives.
- C. Sealants: Gunnable, trowelable, and liquid-applied joint sealants and sealant primers, whether specified or not; including firestopping sealants and duct joint sealers.

1.5 SUBMITTAL REQUIREMENTS

- A. Product Data: For each VOC-restricted product used in the project, submit product data showing compliance, except when another type of evidence of compliance is required.
- B. Verification of Compliance: Submit for each different product in each applicable category.
 - 1. Identify evidence submittals with the words "CALGreen VOC Compliance Report".
- C. Installer Certifications for Accessory Materials:
 - 1. Require each installer of any type of product, not just the products for which VOC restrictions are specified, to certify that either 1) no adhesives, joint sealants, paints, coatings, or composite wood or agrifiber products have been used in the installation of their products, or 2) that such products used comply with these requirements.
 - 2. Use the form following at the end of Part 3 in this Section for Installer certifications.

1.6 QUALITY ASSURANCE

- A. Manufacturer's Testing Agency Qualifications: Independent firm specializing in performing testing and inspections of the type specified in this Section.

PART 2 - PRODUCTS

2.1 MATERIALS

A. General:

1. Provide products conforming to local, State and Federal government requirements limiting the amount of volatile organic compounds contained in the product, for its intended application. If specified product exceeds current requirement, provide conforming product at no additional cost.
2. Provide only products having volatile organic compound (VOC) content not greater than required by South Coast Air Quality Management District Rule No.1168 and less where required by code.
3. Products are specified in multiple Sections throughout these Specifications.

B. Adhesives, Including Carpet and Cushion Adhesives: Comply with CALGreen Section 5.504 and Table 5.504.4.1.

1. Verification of Compliance: Acceptable types are:
 - a. Report of laboratory testing performed in accordance with requirements.
 - b. Published product data showing compliance with requirements.
 - c. Certification by manufacturer that product complies with requirements.
2. Aerosol Adhesives: Comply with Table 5.504.4.1 of CalGreen Section 5.504, and California Code of Regulations Title 17, Section 94507.
 - a. Verification of Compliance: Acceptable types are:
 - 1) Current GreenSeal Certification.
 - 2) Report of laboratory testing performed in accordance with GreenSeal GS-36 requirements.
 - 3) Published product data showing compliance with requirements.
3. Products used shall comply with the following limits.

Table 5.504.4.1 ADHESIVE VOC LIMIT	
Architectural Applications	Current VOC Limit
Indoor Carpet Adhesives	50
Carpet Pad Adhesives	50
Outdoor Carpet Adhesives	150
Wood Flooring Adhesive	100
Rubber Floor Adhesives	60
Subfloor Adhesives	50
Ceramic Tile Adhesives	65
VCT and Asphalt Tile Adhesives	50
Dry Wall and Panel Adhesives	50
Cove Base Adhesives	50
Multipurpose Construction Adhesives	70
Structural Glazing Adhesives	100

VOLATILE ORGANIC COMPOUND (VOC) RESTRICTIONS**SECTION 01 6116.10****3595001**

Table 5.504.4.1 ADHESIVE VOC LIMIT	
Single Ply Roof Membrane Adhesives	250
Other adhesives not specifically listed	250
VOC Limits and Effective Dates**	
Specialty Applications	Current VOC Limit
PVC Welding	510
CPVC Welding	490
ABS Welding	325
Plastic Cement Welding	250
Adhesive Primer for Plastic	550
Contact Adhesive	80
Special Purpose Contact Adhesive	250
Structural Wood Member Adhesive	140
Top and Trim Adhesive	250
** The specified limits remain in effect unless revised limits are listed in the current governing edition of CalGreen.	
For adhesives, adhesive bonding primers, or any other primer not regulated by the above two Tables and applied to the following substrates, the following limits shall apply:	
Substrate Specific Applications	Current VOC Limit
Metal to Metal	30
Plastic Foams	50
Porous Material (except wood)	50
Wood	30
Fiberglass 80	80
Note: If an adhesive is used to bond dissimilar substrates together the adhesive with the highest VOC content shall be allowed.	

C. Joint Sealants: Comply with CALGreen Section 5.504 and Table 5.504.4.2.

1. Verification of Compliance: Acceptable types are:
 - a. Report of laboratory testing performed in accordance with requirements.
 - b. Published product data showing compliance with requirements.
 - c. Certification by manufacturer that product complies with requirements.
2. Products used shall comply with the following limits.

Table 5.504.4.2 SEALANT VOC LIMIT	
Less Water and Less Exempt Compounds in Grams per Liter	
Sealant	Current VOC Limit
Architectural	250
Marine Deck	760
Non-Membrane Roof	300
Roadway	250
Single-Ply Roof Membrane	450

VOLATILE ORGANIC COMPOUND (VOC) RESTRICTIONS**SECTION 01 6116.10****3595001**

Table 5.504.4.2 SEALANT VOC LIMIT	
Less Water and Less Exempt Compounds in Grams per Liter	
Other	420
Sealant Primers	Current VOC Limit
Architectural	
Non-Porous	250
Porous	775
Modified Bituminous	500
Marine Deck	760
Other	750
For low-solid adhesives or sealants the VOC limit is expressed in grams per liter of material; for all other adhesives and sealants, VOC limits are expressed as grams of VOC per liter of adhesive or sealant less water and less exempt compounds.	

- D. Paints and Coatings: Comply with CALGreen Section 5.504 and Table 5.504.4.3 based on the California Air Resources Board, Architectural Coatings Suggested Control Measure.
1. Determination of VOC Content: Testing and calculation in accordance with 40 CFR 59, Subpart D (EPA Method 24), exclusive of colorants added to a tint base and water added at Project site; or other method acceptable to authorities having jurisdiction.
 - a. Verification of Compliance: Acceptable types are:
 - 1) Report of laboratory testing performed in accordance with requirements.
 - 2) Published product data showing compliance with requirements.
 - 3) Certification by manufacturer that product complies with requirements.
 2. Provide coatings that comply with the most stringent requirements specified in the following:
 - a. 40 CFR 59, Subpart D--National Volatile Organic Compound Emission Standards for Architectural Coatings.
 - b. South Coast Air Quality Management District Rule No.1168.
 3. Aerosol Paints and Coatings: Comply with CALGreen 5.504.4.3.1 and, for projects in the jurisdiction of BAAQMD, comply with VOC by weight of product limits of regulation 8, Rule 49.
 4. Products used shall comply with the following limits.

Table 5.504.4.3 VOC CONTENT LIMITS FOR ARCHITECTURAL COATINGS	
(See Notes 2 & 3 below)	
Grams of VOC per Liter of Coating, less water and less exempt compounds	
Coating Category	Current VOC Limit 1/1/2012
Flat Coatings	50

VOLATILE ORGANIC COMPOUND (VOC) RESTRICTIONS
SECTION 01 6116.10
3595001

Table 5.504.4.3 VOC CONTENT LIMITS FOR ARCHITECTURAL COATINGS (See Notes 2 & 3 below)	
Grams of VOC per Liter of Coating, less water and less exempt compounds	
Coating Category	Current VOC Limit 1/1/2012
Non-Flat Coatings	100
Non-Flat High Gloss Coatings	150
Specialty Coatings	
Aluminum Roof Coatings	400
Basement Specialty Coatings	400
Bituminous Roof Coatings	50
Bituminous Roof Primers	350
Bond Breakers	350
Concrete Curing Compounds	350
Concrete / Masonry Sealers	100
Driveway Sealers	50
Dry Fog Coatings	150
Faux Finishing Coatings	350
Fire Resistive Coatings	350
Floor Coatings	100
Form-Release Compounds	250
Graphic Arts Coatings (Sign Paints)	500
High-Temperature Coatings	420
Industrial Maintenance Coatings	250
Low Solids Coatings (See Note 1 below)	120
Magnesite Cement Coatings	450
Mastic Texture Coatings	100
Metallic Pigmented Coatings	500
Multicolor Coatings	250
Pretreatment Wash Primers	420
Primers, Sealers and Undercoaters	100
Reactive Penetrating Sealers	350
Recycled Coatings	250
Roof Coatings	50
Rust Preventative Coatings	250
Shellacs:	
Clear	730
Opaque	550
Specialty Primers, Sealers and Undercoaters	100
Stains	250
Stone Consolidants	450
Swimming Pool Coatings	340
Traffic Marking Coatings	100
Waterproofing Membranes	250
Wood Coatings	275
Wood Preservatives	350

VOLATILE ORGANIC COMPOUND (VOC) RESTRICTIONS
SECTION 01 6116.10
3595001

Table 5.504.4.3 VOC CONTENT LIMITS FOR ARCHITECTURAL COATINGS (See Notes 2 & 3 below)	
Grams of VOC per Liter of Coating, less water and less exempt compounds	
Coating Category	Current VOC Limit 1/1/2012
Zinc Rich Primers	340
Note 1: Grams of VOC per liter of coating including water and including exempt compounds	
Note 2: Not Applicable	
Note 3: Values in this table are derived from those specified by the California Air Resources Board, Architectural Coatings Suggested Control Measure, February 1, 2008. More information is available from the Air Resources Board.	

5. Restricted Components: In addition to the specified VOC limits, paints and coatings shall not contain any of the following:
- a. Acrolein.
 - b. Acrylonitrile.
 - c. Antimony.
 - d. Benzene.
 - e. Butyl benzyl phthalate.
 - f. Cadmium.
 - g. Di (2-ethylhexyl) phthalate.
 - h. Di-n-butyl phthalate.
 - i. Di-n-octyl phthalate.
 - j. 1,2-dichlorobenzene.
 - k. Diethyl phthalate.
 - l. Dimethyl phthalate.
 - m. Ethylbenzene.
 - n. Formaldehyde.
 - o. Hexavalent chromium.
 - p. Isophorone.
 - q. Lead.
 - r. Mercury.
 - s. Methyl ethyl ketone.
 - t. Methyl isobutyl ketone.
 - u. Methylene chloride.
 - v. Naphthalene.
 - w. Toluene (methylbenzene).
 - x. 1,1,1-trichloroethane.
 - y. Vinyl chloride.

VOLATILE ORGANIC COMPOUND (VOC) RESTRICTIONS
SECTION 01 6116.10
3595001

PART 3 - EXECUTION

3.1 FIELD QUALITY CONTROL

- A. Owner reserves the right to reject non-compliant products, whether installed or not, and require their removal and replacement with compliant products at no extra cost to Owner.
- B. Additional costs to restore indoor air quality, including fines by authorities, due to installation of non-compliant products shall be borne by Contractor.

3.2 CERTIFICATION FORM

- A. Use of this Form:
 - 1. Because installers are allowed and directed to choose accessory materials suitable for the applicable installation, there is a possibility that such accessory materials might contain VOC content in excess of that permitted, especially where such materials have not been explicitly specified.
 - 2. Contractor is required to obtain and submit this Form from each installer of work on this project.
 - 3. For each product category listed, circle the correct words in brackets: either [HAS] or [HAS NOT].
 - 4. If these accessory materials have been used, attach to this form product data and MSDS sheet for each such product.

(The Remainder of this Page is Intentionally Left Blank)

ACCESSORY MATERIAL VOC CONTENT CERTIFICATION FORM

IDENTIFICATION:

Project Name: _____

Project No.: _____

Architect: _____

PRODUCT CERTIFICATION: I certify that the installation work of my firm on this project:

1. [HAS] [HAS NOT] required the use of any ADHESIVES.
2. [HAS] [HAS NOT] required the use of any JOINT SEALANTS.
3. [HAS] [HAS NOT] required the use of any PAINTS OR COATINGS.
4. [HAS] [HAS NOT] required the use of any COMPOSITE WOOD or AGRIFIBER PRODUCTS.

Product data and MSDS sheets are attached.

CERTIFIED BY (Installer/Manufacturer/Supplier Firm):

Firm Name: _____

Print Name: _____

Signature: _____

Title: _____ (officer of company)

Date: _____

VOLATILE ORGANIC COMPOUND (VOC) RESTRICTIONS
SECTION 01 6116.10
3595001

END OF SECTION

*p:\sacramento\3595 tracy unified school district\001-000_villalovoz es new shade structures\08 specifications\06 spec\04 final\freiler
- shade struct\01 6116.10_volatile organic compound (voc) restrictions.docx
Last Updated: January 18, 2022*

PRODUCT DELIVERY, STORAGE AND HANDLING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Site Access, Conditions and Requirements;
- B. Special Conditions.

1.02 PRODUCTS

- A. Products are as defined in the General Conditions.
- B. Contractor shall not use and/or reuse materials and/or equipment removed from existing Premises, except as specifically permitted by the Contract Documents.
- C. Contractor shall provide interchangeable components of the same manufacturer, for similar components.

1.03 TRANSPORTATION AND HANDLING

- A. Contractor shall transport and handle Products in accordance with manufacturer's instructions.
- B. Contractor shall promptly inspect shipments to confirm that Products comply with requirements, quantities are correct, and products are undamaged.
- C. Contractor shall provide equipment and personnel to handle Products by methods to prevent soiling, disfigurement, or damage.

1.04 STORAGE AND PROTECTION

- A. Contractor shall store and protect Products in accordance with manufacturer's instructions, with seals and labels intact and legible. Contractor shall store sensitive products in weather-tight, climate controlled enclosures.
- B. For exterior storage of fabricated Products, Contractor shall place on sloped supports, above ground.
- C. Contractor shall provide off-site storage and protection when Site does not permit on-site storage or protection.

- D. Contractor shall cover products subject to deterioration with impervious sheet covering and provide ventilation to avoid condensation.
- E. Contractor shall store loose granular materials on solid flat surfaces in a well-drained area and prevent mixing with foreign matter.
- F. Contractor shall provide equipment and personnel to store Products by methods to prevent soiling, disfigurement, or damage.
- G. Contractor shall arrange storage of Products to permit access for inspection and periodically inspect to assure Products are undamaged and are maintained under specified conditions.

PART 2 – PRODUCTS Not Used.

PART 3 - EXECUTION Not Used.

END OF DOCUMENT

FIELD ENGINEERING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Site Investigation, and Soils Investigation Report;
- B. Special Conditions;
- C. Site-Visit Certification.

1.02 REQUIREMENTS INCLUDED:

- A. Contractor shall provide and pay for field engineering services by a California-registered engineer, required for the project, including, without limitations:
 - (1) Survey work required in execution of the Project.
 - (2) Civil or other professional engineering services specified, or required to execute Contractor's construction methods.

1.03 QUALIFICATIONS OF SURVEYOR OR ENGINEERS:

Contractor shall only use a qualified licensed engineer or registered land surveyor, to whom District makes no objection.

1.04 SURVEY REFERENCE POINTS:

- A. Existing basic horizontal and vertical control points for the Project are those designated on the Drawings.
- B. Contractor shall locate and protect control points prior to starting Site Work and preserve all permanent reference points during construction. In addition Contractor shall:
 - (1) Make no changes or relocation without prior written notice to District and Architect.
 - (2) Report to District and Architect when any reference point is lost or destroyed, or requires relocation because of necessary changes in grades or locations.
 - (3) Require surveyor to replace Project control points based on original survey control that may be lost or destroyed.

1.05 RECORDS:

Contractor shall maintain a complete, accurate log of all control and survey work as it progresses.

1.06 SUBMITTALS:

- A. Contractor shall submit name and address of Surveyor and Professional Engineer to District and Architect prior to its/their work on the Project.
- B. On request of District and Architect, Contractor shall submit documentation to verify accuracy of field engineering work, at no additional cost to the District.
- C. Contractor shall submit a certificate signed by registered engineer or surveyor certifying that elevations and locations of improvements are in conformance or nonconformance with Contract Documents.

PART 2 – PRODUCTS Not Used.**PART 3 - EXECUTION****3.01 COMPLIANCE WITH LAWS:**

Contractor is responsible for meeting all applicable codes, OSHA, safety and shoring requirements.

3.02 NONCONFORMING WORK:

Contractor is responsible for any re-surveying required by correction of nonconforming work.

END OF DOCUMENT

CUTTING AND PATCHING

PART 1 – GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Inspector, Inspections, and Tests, Integration of Work, Nonconforming Work, and Correction of Work, and Uncovering Work;
- B. Special Conditions;
- C. Imported Materials Certification.

1.02 CUTTING AND PATCHING:

- A. Contractor shall be responsible for all cutting, fitting, and patching, including associated excavation and backfill, required to complete the Work or to:
 - (1) Make several parts fit together properly.
 - (2) Uncover portions of Work to provide for installation of ill-timed Work.
 - (3) Remove and replace defective Work.
 - (4) Remove and replace Work not conforming to requirements of Contract Documents.
 - (5) Remove Samples of installed Work as specified for testing.
 - (6) Provide routine penetrations of non-structural surfaces for installation of piping and electrical conduit.
 - (7) Attaching new materials to existing remodeling areas – including painting (or other finishes) to match existing conditions.
- B. In addition to Contract requirements, upon written instructions from the District, Contractor shall uncover Work to provide for observations of covered Work in accordance with the Contract Documents; remove samples of installed materials for testing as directed by District; and remove Work to provide for alteration of existing Work.
- C. Contractor shall not cut or alter Work, or any part of it, in such a way that endangers or compromises the integrity of the Work, the Project, or work of others.

1.03 SUBMITTALS:

- A. Prior to any cutting or alterations that may affect the structural safety of Project, or work of others, and well in advance of executing such cutting or alterations, Contractor shall submit written notice to District pursuant to the applicable notice provisions of the Contract Documents, requesting consent to proceed with the cutting or alteration, including the following:
 - (1) The work of the District or other trades.
 - (2) Structural value or integrity of any element of Project.
 - (3) Integrity or effectiveness of weather-exposed or weather-resistant elements or systems.
 - (4) Efficiency, operational life, maintenance or safety of operational elements.
 - (5) Visual qualities of sight-exposed elements.
- B. Contractor's Request shall also include:
 - (1) Identification of Project.
 - (2) Description of affected Work.
 - (3) Necessity for cutting, alteration, or excavations.
 - (4) Effects of Work on District, other trades, or structural or weatherproof integrity of Project.
 - (5) Description of proposed Work:
 - (a) Scope of cutting, patching, alteration, or excavation.
 - (b) Trades that will execute Work.
 - (c) Products proposed to be used.
 - (d) Extent of refinishing to be done.
 - (6) Alternates to cutting and patching.
 - (7) Cost proposal, when applicable.
 - (8) The scheduled date the Contractor intends to perform the Work and the duration of time to complete the Work.
 - (9) Written permission of District or other District contractor(s) whose work will be affected.

1.04 QUALITY ASSURANCE:

- A. Contractor shall ensure that cutting, fitting, and patching shall achieve security, strength, weather protection, appearance for aesthetic match, efficiency, operational life, maintenance, safety of operational elements, and the continuity of existing fire ratings.
- B. Contractor shall ensure that cutting, fitting, and patching shall successfully duplicate undisturbed adjacent profiles, materials, textures, finishes, colors, and that materials shall match existing construction. Where there is dispute as to whether duplication is successful or has been achieved to a reasonable degree, the District's decision shall be final.

1.05 PAYMENT FOR COSTS:

- A. Cost caused by ill-timed or defective Work or Work not conforming to Contract Documents, including costs for additional services of the District, its consultants, including but not limited to the Construction Manager, the Architect, the Project Inspector(s), Engineers, and Agents, will be paid by Contractor and/or deducted from the Contract by the District.
- B. District shall only pay for cost of Work if it is part of the original Contract Price or if a change has been made to the contract in compliance with the provisions of the General Conditions. Cost of Work performed upon instructions from the District, other than defective or nonconforming Work, will be paid by District on approval of written Change Order. Contractor shall provide written cost proposals prior to proceeding with cutting and patching.

PART 2 - PRODUCTS

2.01 MATERIALS:

- A. Contractor shall provide for replacement and restoration of Work removed. Contractor shall comply with the Contract Documents and with the Industry Standard(s), for the type of Work, and the Specification requirements for each specific product involved. If not specified, Contractor shall first recommend a product of a manufacturer or appropriate trade association for approval by the District.
- B. Materials to be cut and patched include those damaged by the performance of the Work.

PART 3 – EXECUTION

3.01 INSPECTION:

- A. Contractor shall inspect existing conditions of the Site and the Work, including elements subject to movement or damage during cutting and patching, excavating and backfilling. After uncovering Work, Contractor shall inspect conditions affecting installation of new products.

- B. Contractor shall report unsatisfactory or questionable conditions in writing to District as indicated in the General Conditions and shall proceed with Work as indicated in the General Conditions by District.

3.02 PREPARATION:

- A. Contractor shall provide shoring, bracing and supports as required to maintain structural integrity for all portions of the Project, including all requirements of the Project.
- B. Contractor shall provide devices and methods to protect other portions of Project from damage.
- C. Contractor shall, provide all necessary protection from weather and extremes of temperature and humidity for the Project, including without limitation, any work that may be exposed by cutting and patching Work. Contractor shall keep excavations free from water.

3.03 ERECTION, INSTALLATION AND APPLICATION:

- A. With respect to performance, Contractor shall:
 - (1) Execute fitting and adjustment of products to provide finished installation to comply with and match specified tolerances and finishes.
 - (2) Execute cutting and demolition by methods that will prevent damage to other Work, and provide proper surfaces to receive installation of repairs and new Work.
 - (3) Execute cutting, demolition excavating, and backfilling by methods that will prevent damage to other Work and damage from settlement.
- B. Contractor shall employ original installer or fabricator to perform cutting and patching for:
 - (1) Sight-exposed finished surfaces.
- C. Contractor shall execute fitting and adjustment of products to provide a finished installation to comply with specified products, functions, tolerances, and finishes as shown or specified in the Contract Documents including, without limitation, the Drawings and Specifications.
- D. Contractor shall fit Work airtight to pipes, sleeves, conduit, and other penetrations through surfaces. Contractor shall conform to all Code requirements for penetrations or the Drawings and Specifications, whichever calls for a higher quality or more thorough requirement. Contractor shall maintain integrity of both rated and non-rated fire walls, ceilings, floors, etc.
- E. Contractor shall restore Work which has been cut or removed. Contractor shall install new products to provide completed Work in accordance with requirements of the Contract Documents and as required to match surrounding areas and surfaces.

- F. Contractor shall refinish all continuous surfaces to nearest intersection as necessary to match the existing finish to any new finish.

END OF DOCUMENT

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes: Requirements and procedures for ensuring optimal diversion of construction waste materials generated by the Work from landfill disposal within the limits of the Construction Schedule and Contract Sum.
 - 1. The Work of this Contract requires that a minimum of **[65%]** by weight of the construction and demolition materials generated in the Work is diverted from landfill disposal through a combination of re-use and recycling activities.
 - 2. CAL-Green: Alternate waste reduction methods developed in cooperation with local agencies if diversion or recycle facilities capable of compliance with CAL-Green requirements do not exist within the haul boundary of the jobsite (California Code of Regulations, Title 24, Part 11, 5.408).
 - 3. **[LEED projects: Requirements for submittal of LEED documentation in compliance with Materials and Resources Credit 2.1 and Materials and Resources Credit 2.2, Construction Waste Management.]**
 - 4. Requirements for submittal of Contractor's Construction Waste and Recycling Plan prior to the commencement of the Work.
 - 5. Contractor's quantitative reports for construction waste materials as a condition of approval of progress payments submitted to the **[EDIT: Architect or Construction Manager]**

1.2 RELATED REQUIREMENTS

- A. Section 01 3516, Alteration Project Procedures.
- B. Section 01 5000, Temporary Facilities & Controls.
- C. Section 01 7329, Cutting and Patching.
- D. Section 01 8113, Sustainable Design Requirements, for CAL-Green general requirements and procedures.
- E. Section 02 2600, Hazardous Material Abatement (Various Materials).
- F. Section 02 2623, Asbestos Assessment.
- G. Section 02 2626, Lead Assessment.
- H. Section 02 2629, Hazardous Materials Assessment - PCB Ballast & Fluorescent Lamps.
- I. Section 02 4116, Building Demolition.
- J. Section 02 4119, Selective Demolition.
- K. Section 31 1000, Site Clearing.

CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL
SECTION 01 7419
3595001

1.3 REFERENCES AND STANDARDS

- A. California Green Building Standards Code (CALGreen), edition as noted on the drawings, as adopted by the California Division of the State Architect (DSA).

1.4 DEFINITIONS

- A. Class III Landfill: A landfill that accepts non-hazardous resources such as household, commercial, and industrial waste, resulting from construction, remodeling, repair, and demolition operations. A Class III landfill must have a solid waste facilities permit from the California Integrated Waste Management Board (CIWMB) and is regulated by the Enforcement Agency (EA).
- B. Construction and Demolition Debris: Building materials and solid waste resulting from construction, remodeling, repair, cleanup, or demolition operations that are not hazardous as defined in California Code of Regulations, Title 22, Section 66261.3 et seq. This term includes, but is not limited to, asphalt concrete, Portland cement concrete, brick, lumber, gypsum wallboard, cardboard and other associated packaging, roofing material, ceramic tile, carpeting, plastic pipe, and steel. The debris may be commingled with rock, soil, tree stumps, and other vegetative matter resulting from land clearing and landscaping for construction or land development projects.
- C. C&D Recycling Center: A facility that receives only construction and demolition debris material that has been separated for reuse prior to receipt, in which the residual (disposed) amount of waste in the material is less than 10% of the amount separated for reuse by weight.
- D. Disposal: Final deposition of construction and demolition or inert debris into land, including stockpiling onto land of construction and demolition debris that has not been sorted for further processing or resale, if such stockpiling is for a period of time greater than 30 days; and construction and demolition debris that has been sorted for further processing or resale, if such stockpiling is for a period of time greater than one year, or stockpiling onto land of inert debris that is for a period of time greater than one year.
- E. Enforcement Agency (EA): Enforcement agency is the authority having jurisdiction within the Project location.
- F. Inert Disposal Facility or Inert Waste Landfill: A disposal facility that accepts only inert waste such as soil and rock, fully cured asphalt paving, uncontaminated concrete (including fiberglass or steel reinforcing rods embedded in the concrete), brick, glass, and ceramics, for land disposal.
- G. Mixed Debris: Loads that include commingled recyclable and non-recyclable materials generated at the construction site.
- H. Mixed Debris Recycling Facility: A processing facility that accepts loads of commingled construction and demolition debris for the purpose of recovering re-usable and recyclable materials and disposing the non-recyclable residual materials.

CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL
SECTION 01 7419
3595001

- I. Recycling: The process of sorting, cleansing, treating and reconstituting materials for the purpose of using the altered form in the manufacture of a new product. Recycling does not include burning, incinerating or thermally destroying solid waste.
- J. Reuse. The use, in the same or similar form as it was produced, of a material which might otherwise be discarded.
- K. Separated for Reuse. Materials, including commingled recyclables, that have been separated or kept separate from the solid waste stream for the purpose of additional sorting or processing those materials for reuse or recycling in order to return them to the economic mainstream in the form of raw material for new, reused, or reconstituted products which meet the quality standards necessary to be used in the marketplace, and includes materials that have been "source separated".
- L. Solid Waste: All putrescible and nonputrescible solid, semisolid, and liquid wastes, including garbage, trash, refuse, paper, rubbish, ashes, industrial wastes, demolition and construction wastes, abandoned vehicles and parts thereof, discarded home and industrial appliances, dewatered, treated, or chemically fixed sewage sludge which is not hazardous waste, manure, vegetable or animal solid and semisolid wastes, and other discarded solid and semisolid wastes. "Solid waste" does not include hazardous waste, radioactive waste, or medical waste as defined or regulated by State law.
- M. Source-Separated: Materials, including commingled recyclables, that have been separated or kept separate from the solid waste stream at the point of generation, for the purpose of additional sorting or processing of those materials for reuse or recycling in order to return them to the economic mainstream in the form of raw materials for new, reused, or reconstituted products which meet the quality standards necessary to be used in the marketplace.
- N. Waste Hauler: A company that possesses a valid permit from the local waste management authority having jurisdiction to collect and transport solid wastes from individuals or businesses for the purpose of recycling or disposal.

1.5 ADMINISTRATIVE REQUIREMENTS

- A. Submittal Procedures:
 - 1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
 - 2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
 - 3. Sustainable Design Submittals shall comply with the additional requirements of Section 01 8113, Sustainable Design Requirements.

1.6 ACTION SUBMITTALS

- A. Contractor's Construction Waste and Recycling Plan:
 - 1. Review Contract Documents and estimate the types and quantities of materials under the Work that are anticipated to be feasible for on-site processing, source separation for re-use or recycling. Indicate the procedures that will be implemented

CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL
SECTION 01 7419
3595001

- in this program to effect jobsite source separation, such as, identifying a convenient location where dumpsters would be located, putting signage to identify materials to be placed in dumpsters, etc.
2. Prior to commencing the Work, submit Contractor's Construction Waste and Recycling Plan. Submit in format provided with this specification section. The Plan must include, but is not limited to the following:
 - a. Contractor's name and project identification information;
 - b. Procedures to be used;
 - c. Materials to be re-used and recycled;
 - d. Estimated quantities of materials;
 - e. Names and locations of re-use and recycling facilities/sites;
 - f. Tonnage calculations that demonstrate that Contractor will re-use and recycle a minimum of **[65%]** by weight of the construction waste materials generated by the Work.
 3. Contractor's Construction Waste and Recycling Plan must be approved by the Architect prior to the start of Work.
 4. Contractor's Construction Waste and Recycling Plan will not otherwise relieve the Contractor of responsibility for adequate and continuing control of pollutants and other environmental protection measures

1.7 INFORMATIONAL SUBMITTALS

- A. Contractor's Reuse, Recycling, and Disposal Report:
 1. Submit Contractor's Reuse, Recycling, and Disposal Report on the form provided with this specification section with each Application & Certificate for Payment. Failure to submit the form and its supporting documentation will render the Application & Certificate for Payment incomplete and delay progress payments. If applicable, include manifests, weight tickets, receipts, and invoices specifically identifying the Project for re-used and recycled materials:
 - a. Reuse of building materials or salvage items on site (i.e. crushed base or red clay brick).
 - b. Salvaging building materials or salvage items at an offsite salvage or reuse center (i.e. lighting, fixtures).
 - c. Recycling source separated materials on site (i.e. crushing asphalt/concrete for base course, or grinding for mulch).
 - d. Recycling source separated material at an offsite recycling center (i.e. scrap metal or green materials).
 - e. Use of material as Alternative Daily Cover (ADC) at landfills.
 - f. Delivery of soils or mixed inerts to an inert landfill for disposal (inert fill).
 - g. Disposal at a landfill or transfer station (where no recycling takes place).
 - h. Other (describe).
 2. Contractor's Reuse, Recycling, and Disposal Report must quantify all materials generated in the Work, disposed in Class III landfills, or diverted from disposal through recycling. Indicate zero (0) if there is no quantity to report for a type of material. As indicated on the form:

CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL
SECTION 01 7419
3595001

- a. Report disposal or recycling either in tons or in cubic yards. If scales are available at disposal or recycling facility, report in tons; otherwise, report in cubic yards. Report in units for salvage items when no tonnage or cubic yard measurement is feasible.
 - b. Indicate locations to which materials are delivered for reuse, salvage, recycling, accepted as daily cover, inert backfill, or disposal in landfills or transfer stations.
 - c. Provide legible copies of weight tickets, receipts, or invoices that specifically identify the project generating the material. Said documents must be from recyclers and/or disposal site operators that can legally accept the materials for the purpose of re-use, recycling, or disposal.
 - 1) Indicate project title, project number, progress payment number, name of the company completing the Contractor's Report and compiling backup documentation, the printed name, signature, and daytime phone number of the person completing the form, the beginning and ending dates of the period covered on the Contractor's Report, and the date that the Contractor's Report is completed.
3. Demonstrate compliance with California Code of Regulations, Title 24, Part 11 California Green Building Standards Code, "CAL-Green" 5.408.2, to the satisfaction of the enforcing agency.
- a. Landfill **[and Incinerator]** Disposal Records: Indicate receipt and acceptance of waste by landfills **[and incinerator]** facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.
 - b. Recycling and Processing Facility Records: Indicate receipt and acceptance of recyclable waste by recycling and processing facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.
- B. **[For LEED Projects only]** LEED Letter Template: Materials and Resources Credit **[2.1]**
[2.2] Construction Waste Management
1. Complete and sign LEED Letter Template in format provided under the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED) program. Prepare Letter Template on company letterhead.
 - a. Certify that the project has completed a waste management plan and diverted construction, demolition, and land clearing waste to uses other than landfill.
 - b. Provide quantities of diverted materials and means of diversion in the table provided in the LEED Letter Template.
 - c. Indicate how and where waste was diverted.
 - d. Indicate quantities of waste diverted in tons or cubic yards.
 - e. Letter Template will calculate: Total quantity of diverted waste, total quantity of waste, and the percentage of waste diverted.
 - f. For projects where 50% of waste is diverted, one LEED credit will be achieved; where 75% is diverted, two LEED credits will be achieved.
 - g. Include name, organization, role in project, provide signature and date complete

CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL
SECTION 01 7419
3595001

PART 2 - PRODUCTS-NOT USED

PART 3 - EXECUTION

3.1 WASTE MANAGEMENT PLAN

- A. Implement procedures for disposal of materials, as specified in Contractor's Construction Waste and Recycling Plan, which are not diverted for re-use, salvage or recycling.
 - 1. Identify materials to be diverted from disposal by efficient usage, recycling, reuse on the project, or salvage for future use or sale.
 - 2. Determine if materials will be sorted on-site or mixed.
 - 3. Identify diversion facilities where material collected will be taken.
 - 4. Specify that quantities of diverted material will be calculated by weight or volume, but not both.

3.2 SALVAGE, RE-USE, RECYCLING AND PROCEDURES

- A. Re-use, Salvage, and Recycling Facilities: As specified in Contractor's Construction Waste and Recycling Plan.
- B. Develop and implement procedures to re-use, salvage, and recycle new construction and excavation materials, based on the Contract Documents, the Contractor's Construction Waste and Recycling Plan, estimated quantities of available materials, and availability of recycling facilities. Procedures may include on-site recycling, source separated recycling, and/or mixed debris recycling efforts.
 - 1. Identify materials that are feasible for salvage, determine requirements for site storage, and transportation of materials to a salvage facility.
 - 2. Source separate new construction, excavation and demolition materials including, but not limited to the following types.
 - a. Asphalt.
 - b. Concrete, concrete block, slump stone (decorative concrete block), and rocks.
 - c. Drywall.
 - d. Green materials (i.e. tree trimmings and land clearing debris).
 - e. Metal (ferrous and non-ferrous).
 - f. Miscellaneous Construction Debris.
 - g. Paper or cardboard.
 - h. Red Clay Brick.
 - i. Reuse or Salvage Materials
 - j. Soils.
 - k. Wire and Cable.
 - l. Wood.
 - m. Other (describe)

CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL
SECTION 01 7419
3595001

3. Miscellaneous Construction Debris: Develop and implement a program to transport loads of mixed (commingled) new construction materials that cannot be feasibly source separated to a mixed materials recycling facility

3.3 DISPOSAL OPERATIONS AND WASTE HAULING

- A. Legally transport and dispose of materials that cannot be delivered to a source separated or mixed recycling facility to a transfer station or disposal facility that can legally accept the materials for the purpose of disposal.
- B. Use a permitted waste hauler or Contractor's trucking services and personnel. To confirm valid permitted status of waste haulers, contact the local solid waste authority having jurisdiction.
- C. Become familiar with the conditions for acceptance of new construction, excavation and demolition materials at recycling facilities, prior to delivering materials.
- D. Deliver to facilities that can legally accept new construction, excavation and demolition materials for purpose of re-use, recycling, composting, or disposal.
- E. Do not burn, bury or otherwise dispose of solid waste on the project job-site.

3.4 RE-USE AND DONATION OPTIONS

- A. Implement a re-use program to the greatest extent feasible. Options may include:
 1. California Materials Exchange (CAL-MAX) Program is sponsored by the California Integrated Waste Management Board. CAL-MAX is a free service provided by the California Integrated Waste Management Board, designed to help businesses find markets for materials that traditionally would be discarded. The premise of the CAL-MAX Program is that material discarded by one business may be a resource for another business. To obtain a current Materials Listings Catalog, call CAL-MAX/California Integrated Waste Management Board at (916) 255-2369 or send a FAX to (916) 255-2200. The CALMAX Catalog is available through the Internet Site at <http://www.ciwmb/ca.gov/calmax>.

3.5 REVENUE

- A. Revenues or other savings obtained from recycled, re-used, or salvaged materials shall accrue to Contractor unless otherwise noted in the Contract Documents

END OF SECTION

p:\sacramento\3595 tracy unified school district\001-000_villalovoz es new shade structures\08 specifications\06 spec\04 final\freiler - shade struct\01 7419_construction waste management and disposal.docx
Last Updated: December 16, 2021

SECTION 01 7419A
CONTRACTOR'S CONSTRUCTION WASTE AND RECYCLING PLAN
(Submit After Award of Contract and Prior to Start of Work)

Project Title:		
Contract or Work Order No.:		
Contractor's Name:		
Street Address:		
City:	State:	Zip:
Phone: ()	Fax: ()	
E-Mail Address:		
Prepared by: (Print Name)		

Date Submitted:		
Project Period:	From:	TO:

Reuse, Recycling or Disposal Processes To Be Used

Describe the types of recycling processes or disposal activities that will be used for material generated in the project. Indicate the type of process or activity by number, types of materials, and estimated quantities that will be recycled or disposed in the sections below:

- 01 - Reuse of building materials or salvage items on site (i.e. crushed base or red clay brick)
- 02 - Salvaging building materials or salvage items at an off site salvage or re-use center (i.e. lighting, fixtures)
- 03 - Recycling source separated materials on site (i.e. crushing asphalt/concrete for reuse or grinding for mulch)
- 04 - Recycling source separated materials at an off site recycling center (i.e. scrap metal or green matls)
- 05 - Recycling commingled loads of C&D matls at an off site mixed debris recycling center or transfer station
- 06 - Recycling material as Alternative Daily Cover at landfills
- 07 - Delivery of soils or mixed inerts to an inert landfill for disposal (inert fill).
- 08 - Disposal at a landfill or transfer station.
- 09 - Other (please describe) _____

Types of Material To Be Generated

Use these codes to indicate the types of material that will be generated on the project

A = Asphalt	C = Concrete	M = Metals	I = Mixed Inert	G = Green Matls
D = Drywall	P/C=Paper/Cardboard	W/C = Wire/Cable	S= Soils (Non Hazardous)	
M/C = Miscellaneous Construction Debris	R = Reuse/Salvage	W = Wood	O = Other (describe)	

Facilities Used: Provide Name of Facility and Location (City)

Total Truck Loads: Provide Number of Trucks Hauled from Site During Reporting Period

Total Quantities: If scales are available at sites, report in tons. If not, quantify by cubic yards. For salvage/reuse items, quantify by estimated weight (or units).

SECTION I - RE-USED/RECYCLED MATERIALS

Include all recycling activities for source separated or mixed material recycling centers where recycling will occur.

Type of Material	Type of Activity	Facility to be Used/Location	Total Truck Loads	Total Quantities		
(ex.) M	04	ABC Metals, Los Angeles	24	Tons	Cubic YD	Other Wt.
a. Total Diversion			0	0	0	0

SECTION 01 7419A
CONTRACTOR'S CONSTRUCTION WASTE AND RECYCLING PLAN
Continued

SECTION II - DISPOSED MATERIALS						
<i>Include all disposal activities for landfills, transfer stations, or inert landfills where no recycling will occur.</i>						
Type of Material	Type of Activity	Facility to be Used/Location	Total Truck Loads	Total Quantities		
				Tons	Cubic YD	Other Wt.
(ex.) D	08	DEF Landfill, Los Angeles	2	35		
b. Total Disposal				0	0	0

SECTION III - TOTAL MATERIALS GENERATED						
<i>This section calculates the total materials to be generated during the project period (Reuse/Recycle + Disposal = Generation)</i>						
				Tons	Cubic YD	Other Wt.
a. Total Reused/Recycled				0	0	0
b. Total Disposed				0	0	0
c. Total Generated				0	0	0

SECTION IV - CONTRACTOR'S LANDFILL DIVERSION RATE CALCULATION						
<i>Add totals from Section I + Section II</i>						
	Tons	Cubic Yards	Other Wt.			
a. Materials Re-Used and Recycled	0					
b. Materials Disposed	0					
c. Total Materials Generated (a. + b. = c.)	0	0	0			
d. Landfill Diversion Rate (Tons Only)*	#DIV/0!					

* Use tons only to calculate recycling percentages: Tons Reused/Recycled/Tons Generated = % Recycled

Contractor's Comments (Provide any additional information pertinent to planned reuse, recycling, or disposal activities):

Notes:

1. Suggested Conversion Factors: From Cubic Yards to Tons (Use when scales are not available)

Asphalt: .61 (ex. 1000 CY Asphalt = 610 tons. Applies to broken chunks of asphalt)

Concrete: .93 (ex. 1000 CY Concrete = 930 tons. Applies to broken chunks of concrete)

Ferrous Metals: .22 (ex. 1000 CY Ferrous Metal = 220 tons)

Non-Ferrous Metals: .10 (ex. 1000 CY Non-Ferrous Metals = 100 tons)

Drywall Scrap: .20

Wood Scrap: .16

SECTION 01 7419B
CONTRACTOR'S REUSE, RECYCLING, AND DISPOSAL REPORT
(Submit With Each Progress Payment)

Project Title:		
Contract or Work Order No.:		
Contractor's Name:		
Street Address:		
City:	State:	Zip:
Phone: ()	Fax: ()	
E-Mail Address:		
Prepared by: (Print Name)		

Date Submitted:		
Period Covered:	From:	To:

Reuse, Recycling or Disposal Processes Used

Describe the types of recycling processes or disposal activities used for material generated in the project. Indicate the type of process or activity by number, types of materials, and quantities that were recycled or disposed in the sections below:

01 - Reuse of building materials or salvage items on site (i.e. crushed base or red clay brick)
02 - Salvaging building materials or salvage items at an off site salvage or re-use center (i.e. lighting, fixtures)
03 - Recycling source separated materials on site (i.e. crushing asphalt/concrete for reuse or grinding for mulch)
04 - Recycling source separated materials at an off site recycling center (i.e. scrap metal or green matls)
05 - Recycling commingled loads of C&D matls at an off site mixed debris recycling center or transfer station
06 - Recycling material as Alternative Daily Cover at landfills
07 - Delivery of soils or mixed inerts to an inert landfill for disposal (inert fill).
08 - Disposal at a landfill or transfer station.
09 - Other (please describe) _____

Types of Material Generated

Use these codes to indicate the types of material that were generated on the project

A = Asphalt	C = Concrete	M = Metals	I = Mixed Inert	G = Green Matls
D = Drywall	P/C=Paper/Cardboard	W/C = Wire/Cable	S= Soils (Non Hazardous)	
M/C = Miscellaneous Construction Debris	R = Reuse/Salvage	W = Wood	O = Other (describe)	

Facilities Used: Provide Name of Facility and Location (City)

Total Truck Loads: Provide Number of Trucks Hauled from Site During Reporting Period

Total Quantities: If scales are available at sites, report in tons. If not, quantify by cubic yards. For salvage/reuse items, quantify by estimated weight (or units).

SECTION I - RE-USED/RECYCLED MATERIALS

Include all recycling activities for source separated or mixed material recycling centers where recycling occurred.

Type of Material	Type of Activity	Facilities Used/Location	Total Truck Loads	Total Quantities		
(ex.) M	04	ABC Metals, Los Angeles	24	Tons	Cubic YD	Other Wt.
a. Total Diversion			0	0	0	0

SECTION 01 7419B
CONTRACTOR'S REUSE, RECYCLING, AND DISPOSAL REPORT
Continued

SECTION II - DISPOSED MATERIALS						
<i>Include all disposal activities for landfills, transfer stations, or inert landfills where no recycling occurred.</i>						
Type of Material	Type of Activity	Facilities Used/Location	Total Truck Loads	Total Quantities		
				Tons	Cubic YD	Other Wt.
(ex.) D	08	DEF Landfill, Los Angeles	2	35		
b. Total Disposal				0	0	0

SECTION III - TOTAL MATERIALS GENERATED						
<i>This section calculates the total materials generated during the project period (Reuse/Recycle + Disposal = Generation)</i>						
				Tons	Cubic YD	Other Wt.
a. Total Reused/Recycled				0	0	0
b. Total Disposed				0	0	0
c. Total Generated				0	0	0

SECTION IV - CONTRACTOR'S LANDFILL DIVERSION RATE CALCULATION						
<i>Add totals from Section I + Section II</i>						
	Tons	Cubic Yards	Other Wt.			
a. Materials Re-Used and Recycled	0					
b. Materials Disposed	0					
c. Total Materials Generated (a. + b. = c.)	0	0	0			
d. Landfill Diversion Rate (Tons Only)*	#DIV/0!					

* Use tons only to calculate recycling percentages: Tons Reused/Recycled/Tons Generated = % Recycled

Contractor's Comments (<i>Provide any additional information pertinent to planned reuse, recycling, or disposal activities</i>):						

Notes:

- Suggested Conversion Factors: From Cubic Yards to Tons (Use when scales are not available)
Asphalt: .61 (ex. 1000 CY Asphalt = 610 tons. Applies to broken chunks of asphalt)
Concrete: .93 (ex. 1000 CY Concrete = 930 tons. Applies to broken chunks of concrete)
Ferrous Metals: .22 (ex. 1000 CY Ferrous Metal = 220 tons)
Non-Ferrous Metals: .10 (ex. 1000 CY Non-Ferrous Metals = 100 tons)
Drywall Scrap: .20
Wood Scrap: .16

ALTERATION PROJECT PROCEDURES

PART 1 – GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Integration of Work, Purchase of Materials and Equipment, Uncovering of Work and Non-conforming Work and Correction of Work and Trenches;
- B. Special Conditions.

PART 2 - PRODUCTS

2.01 PRODUCTS FOR PATCHING AND EXTENDING WORK:

- A. New Materials: As specified in the Contract Documents including, without limitation, in the Specifications, Contractor shall match existing products, conditions, and work for patching and extending work.
- B. Type and Quality of Existing Products: Contractor shall determine by inspection, by testing products where necessary, by referring to existing conditions and to the Work as a standard.

PART 3 - EXECUTION

3.01 EXAMINATION:

- A. Contractor shall verify that demolition is complete and that areas are ready for installation of new Work.
- B. By beginning restoration Work, Contractor acknowledges and accepts the existing conditions.

3.02 PREPARATION:

- A. Contractor shall cut, move, or remove items as necessary for access to alterations and renovation Work. Contractor shall replace and restore these at completion.
- B. Contractor shall remove unsuitable material not as salvage unless otherwise indicated in the Contract Documents. Unsuitable material may include, without limitation, rotted wood, corroded metals, and deteriorated masonry and concrete. Contractor shall replace materials as specified for finished Work.

- C. Contractor shall remove debris and abandoned items from all areas of the Site and from concealed spaces.
- D. Contractor shall prepare surface and remove surface finishes to provide for proper installation of new Work and finishes.

3.03 INSTALLATION:

- A. Contractor shall coordinate Work of all alternations and renovations to expedite completion and to accommodate District occupancy.
- B. Designated Areas and Finishes: Contractor shall complete all installations in all respects, including operational, and electrical work.
- C. Contractor shall remove, cut, and patch Work in a manner to minimize damage and to provide a means of restoring Products and finishes to original or specified condition.
- D. Contractor shall refinish visible existing surfaces to remain to specified condition for each material, with a neat and square or straight transition to adjacent finishes.
- E. Contractor shall install products as specified in the Contract Documents, including without limitation, the Specifications.

3.04 TRANSITIONS:

- A. Where new Work abuts or aligns with existing, Contractor shall perform a smooth and even transition. Patched Work must match existing adjacent work in texture and appearance.
- B. When finished surfaces are cut so that a smooth transition with new Work is not possible, Contractor shall terminate existing surface along a straight line at a natural line of division and make a recommendation for resolution to the District and the Architect for review and approval.

3.05 ADJUSTMENTS:

- A. Where a change of plane of 1/4 inch or more occurs, Contractor shall submit a recommendation for providing a smooth transition to the District and the Architect for review and approval.
- B. Contractor shall fit Work at penetrations of surfaces.

3.06 REPAIR OF DAMAGED SURFACES:

- A. Contractor shall patch or replace portions of existing surfaces, which are damaged, lifted, discolored, or showing other imperfections, in the area where the Work is performed.
- B. Contractor shall repair substrate prior to patching finish.

3.07 CULTIVATED AREAS AND OTHER SURFACE IMPROVEMENTS:

- A. Cultivated or planted areas and other surface improvements which are damaged by actions of the Contractor shall be restored by Contractor to their original condition or better, where indicated.
- B. Contractor shall protect and replace, if damaged, all existing guard posts, barricades, and fences.
- C. Contractor shall give special attention to avoid damaging or killing trees, bushes and/or shrubs on the Premises and/or identified in the Contract Documents, including without limitation, the Drawings.

3.08 FINISHES:

- A. Contractor shall finish surfaces as specified in the Contract Documents, including without limitations, the provisions of all Divisions of the Specifications.
- B. Contractor shall finish patches to produce uniform finish and texture over entire area. When finish cannot be matched, Contractor shall refinish entire surface to nearest intersections.

3.09 CLEANING:

- A. Contractor shall continually clean the Site and the Premises as indicated in the Contract Documents, including without limitation, the provisions in the General Conditions and the Specifications regarding cleaning.

END OF DOCUMENT

CONTRACT CLOSEOUT AND FINAL CLEANING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Completion of Work;
- B. Special Conditions;
- C. Temporary Facilities and Controls.

1.02 CLOSEOUT PROCEDURES

Contractor shall comply with all closeout provisions as indicated in the General Conditions.

1.03 FINAL CLEANING

- A. Contractor shall execute final cleaning prior to final inspection.
- B. Contractor shall clean interior and exterior glass and all surfaces exposed to view; remove temporary labels, tape, stains, and foreign substances, polish transparent and glossy surfaces, wax and polish new vinyl floor surfaces, vacuum carpeted and soft surfaces.
- C. Contractor shall clean equipment and fixtures to a sanitary condition.
- D. Contractor shall replace filters of operating equipment.
- E. Contractor shall clean debris from roofs, gutters, down spouts, and drainage systems.
- F. Contractor shall clean Site, sweep paved areas, and rake clean landscaped surfaces.
- G. Contractor shall remove waste and surplus materials, rubbish, and construction facilities from the Site and surrounding areas.

1.04 ADJUSTING

Contractor shall adjust operating products and equipment to ensure smooth and unhindered operation.

1.05 RECORD DOCUMENTS AND SHOP DRAWINGS

- A. Contractor shall legibly mark each item to record actual construction, including:
 - (1) Measured depths of foundation in relation to finish floor datum.
 - (2) Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permit surface improvements.
 - (3) Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.
 - (4) Field changes of dimension and detail.
 - (5) Details not on original Contract Drawings
 - (6) Changes made by modification(s).
 - (7) References to related Shop Drawings and modifications.
- B. Contractor will provide one set of Record Drawings to District.
- C. Contractor shall submit all required documents to District and/or Architect prior to or with its final Application for Payment.

1.06 INSTRUCTION OF DISTRICT PERSONNEL

- A. Before final inspection, at agreed upon times, Contractor shall instruct District's designated personnel in operation, adjustment, and maintenance of products, equipment, and systems.
- B. For equipment requiring seasonal operation, Contractor shall perform instructions for other seasons within six months or by the change of season.
- C. Contractor shall use operation and maintenance manuals as basis for instruction. Contractor shall review contents of manual with personnel in detail to explain all aspects of operation and maintenance.
- D. Contractor shall prepare and insert additional data in Operation and Maintenance Manual when the need for such data becomes apparent during instruction.
- E. Contractor shall review contents of manual with personnel in detail to explain all aspects of operation and maintenance.

1.07 SPARE PARTS AND MAINTENANCE MATERIALS

- A. Contractor shall provide products, spare parts, maintenance, and extra materials in quantities specified in the Specifications and in Manufacturer's recommendations.

- B. Contractor shall provide District with all required Operation and Maintenance Data at one time. Partial or piecemeal submissions of Operation and Maintenance Data will not be accepted.

PART 2 – PRODUCTS Not Used.

PART 3 – EXECUTION Not Used.

END OF DOCUMENT

OPERATION AND MAINTENANCE DATA

PART 1 – GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Completion of the Work;
- B. Special Conditions.

1.02 QUALITY ASSURANCE:

Contractor shall prepare instructions and data by personnel experienced in maintenance and operation of described products.

1.03 FORMAT:

- A. Contractor shall prepare data in the form of an instructional manual entitled "OPERATIONS AND MAINTENANCE MANUAL & INSTRUCTIONS" ("Manual").
- B. Binders: Contractor shall use commercial quality, 8-1/2 by 11 inch, three-side rings, with durable plastic covers; two inch maximum ring size. When multiple binders are used, Contractor shall correlate data into related consistent groupings.
- C. Cover: Contractor shall identify each binder with typed or printed title "OPERATION AND MAINTENANCE MANUAL & INSTRUCTIONS"; and shall list title of Project and identify subject matter of contents.
- D. Contractor shall arrange content by systems process flow under section numbers and sequence of Table of Contents of the Contract Documents.
- E. Contractor shall provide tabbed fly leaf for each separate product and system, with typed description of product and major component parts of equipment.
- F. Text: The content shall include Manufacturer's printed data, or typewritten data on 24 pound paper.
- G. Drawings: Contractor shall provide with reinforced punched binder tab and shall bind in with text; folding larger drawings to size of text pages.

1.04 CONTENTS, EACH VOLUME:

- A. Table of Contents: Contractor shall provide title of Project; names, addresses, and telephone numbers of the Architect, any engineers, subconsultants, Subcontractor(s), and Contractor with name of responsible parties; and schedule of products and systems, indexed to content of the volume.

- B. For Each Product or System: Contractor shall list names, addresses, and telephone numbers of Subcontractor(s) and suppliers, including local source of supplies and replacement parts.
- C. Product Data: Contractor shall mark each sheet to clearly identify specific products and component parts, and data applicable to installation. Delete inapplicable information.
- D. Drawings: Contractor shall supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams. Contractor shall not use Project Record Documents as maintenance drawings.
- E. Text: Contractor shall include any and all information as required to supplement product data. Contractor shall provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions.
- F. Warranties and Bonds: Contractor shall bind in one copy of each.

1.05 MANUAL FOR MATERIALS AND FINISHES:

- A. Building Products, Applied Materials, and Finishes: Contractor shall include product data, with catalog number, size, composition, and color and texture designations. Contractor shall provide information for re-ordering custom manufactured products.
- B. Instructions for Care and Maintenance: Contractor shall include Manufacturer's recommendations for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.
- C. Moisture Protection and Weather Exposed Products: Contractor shall include product data listing applicable reference standards, chemical composition, and details of installation. Contractor shall provide recommendations for inspections, maintenance, and repair.
- D. Additional Requirements: Contractor shall include all additional requirements as specified in the Specifications.
- E. Contractor shall provide a listing in Table of Contents for design data, with tabbed fly sheet and space for insertion of data.

1.06 MANUAL FOR EQUIPMENT AND SYSTEMS:

- A. Each Item of Equipment and Each System: Contractor shall include description of unit or system, and component parts and identify function, normal operating characteristics, and limiting conditions. Contractor shall include performance curves, with engineering data and tests, and complete nomenclature, and commercial number of replaceable parts.
- B. Panelboard Circuit Directories: Contractor shall provide electrical service characteristics, controls, and communications.

- C. Contractor shall include color coded wiring diagrams as installed.
- D. Operating Procedures: Contractor shall include start-up, break-in, and routine normal operating instructions and sequences. Contractor shall include regulation, control, stopping, shut-down, and emergency instructions. Contractor shall include summer, winter, and any special operating instructions.
- E. Maintenance Requirements: Contractor shall include routine procedures and guide for trouble-shooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.
- F. Contractor shall provide servicing and lubrication schedule, and list of lubricants required.
- G. Contractor shall include manufacturer's printed operation and maintenance instructions.
- H. Contractor shall include sequence of operation by controls manufacturer.
- I. Contractor shall provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.
- J. Contractor shall provide control diagrams by controls manufacturer as installed.
- K. Contractor shall provide Contractor's coordination drawings, with color coded piping diagrams as installed.
- L. Contractor shall provide charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams.
- M. Contractor shall provide list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.
- N. Additional Requirements: Contractor shall include all additional requirements as specified in Specification(s).
- O. Contractor shall provide a listing in Table of Contents for design data, with tabbed fly sheet and space for insertion of data.

1.07 SUBMITTAL:

- A. Contractor shall submit to the District for review two (2) copies of preliminary draft or proposed formats and outlines of the contents of the Manual within thirty (30) days of Contractor's start of Work.
- B. For equipment, or component parts of equipment put into service during construction and to be operated by District, Contractor shall submit draft content for that portion of the Manual within ten (10) days after acceptance of that equipment or component.

- C. Contractor shall submit two (2) copies of a complete Manual in final form prior to final Application for Payment. Copy will be returned with Architect/Engineer comments. Contractor must revise the content of the Manual as required by District prior to District's approval of Contractor's final Application for Payment.
- D. Contractor must submit two (2) copies of revised Manual in final form within ten (10) days after final inspection.

PART 2 – PRODUCTS Not Used.

PART 3 – EXECUTION Not Used.

END OF DOCUMENT

WARRANTIES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Warranty/Guarantee Information;
- B. Special Conditions.

1.02 FORMAT

- A. Binders: Contractor shall use commercial quality, 8-1/2 by 11 inch, three-side rings, with durable plastic covers; two inch maximum ring size.
- B. Cover: Contractor shall identify each binder with typed or printed title "WARRANTIES" and shall list title of Project.
- C. Table of Contents: Contractor shall provide title of Project; name, address, and telephone number of Contractor and equipment supplier; and name of responsible principal. Contractor shall identify each item with the number and title of the specific Specification, document, provision, or section in which the name of the product or work item is specified.
- D. Contractor shall separate each warranty with index tab sheets keyed to the Table of Contents listing, providing full information and using separate typed sheets as necessary. Contractor shall list each applicable and/or responsible Subcontractor(s), supplier(s), and/or manufacturer(s), with name, address, and telephone number of each responsible principal(s).

1.03 PREPARATION:

- A. Contractor shall obtain warranties, executed in duplicate by each applicable and/or responsible subcontractor(s), supplier(s), and manufacturer(s), within ten (10) days after completion of the applicable item or work. Except for items put into use with District's permission, Contractor shall leave date of beginning of time of warranty blank until the date of completion is determined.
- B. Contractor shall verify that documents are in proper form, contain full information, and are notarized, when required.
- C. Contractor shall co-execute submittals when required.
- D. Contractor shall retain warranties until time specified for submittal.

1.04 TIME OF SUBMITTALS:

- A. For equipment or component parts of equipment put into service during construction with District's permission, Contractor shall submit a draft warranty for that equipment or component within ten (10) days after acceptance of that equipment or component.
- B. Contractor shall submit for District approval all warranties and related documents within ten (10) days after date of completion. Contractor must revise the warranties as required by the District prior to District's approval of Contractor's final Application for Payment.
- C. For items of work delayed beyond date of completion, Contractor shall provide an updated submittal within ten (10) days after acceptance, listing the date of acceptance as start of warranty period.

PART 2 - PRODUCTS Not Used.

PART 3 – EXECUTION Not Used.

END OF DOCUMENT

(Letterhead of Contractor)

STANDARD GUARANTEE / WARRANTY

for

Project Name

Contract No.

We hereby warrant that the Work we have provided under the above reference Contract has been completed in accordance with the Drawings, Specifications, and other Contract Documents.

Under the terms of this warranty, we agree to repair or replace any or all of our work, together with any other adjacent work which may be displaced or damaged by so doing, which may prove to be either patently defective in its workmanship or latently defective in its workmanship or materials within the period of 24 months from the date of filing of the Notice of Completion of the above named Project by the Board of Trustees of the School District, and we also agree to repair any and all damages resulting from such defects, without any expense whatsoever to said Board of Trustees, ordinary wear and tear and unusual abuse or neglect excepted.

In the event of our failure to comply with above-mentioned guarantee conditions within ten (10) day after being notified in writing by the Owner, we collectively and separately do hereby authorize the Owner to have said defective work and damages repaired or replaced and made good at our expense and will honor and pay the costs and charges therefore upon demand.

SIGNED (Contractor) _____

(Address)

(Printed Name of Authorized Representative)

Signature

(License Number)

(Date of Signing)

COUNTERSIGNED (Owner) _____

(Printed Name of Authorized Representative)

Signature

Date of Filing or Notice of Completion: _____

(Letterhead of Company)

SUBCONTRACTOR STANDARD GUARANTEE / WARRANTY

We hereby warrant that

which we have provided in _____

for _____

has been completed in accordance with Specification Section _____ and requirements of the Contract Documents.

Under the terms of this warranty, we agree to repair or replace any or all of our work, together with any other adjacent work which may be displaced or damaged by so doing, which may prove to be either patently defective in its workmanship or latently defective in its workmanship or materials within a period of 24 months from date of filing the Notice of Completion of the above-named Project by the Board of Trustees of the School District without any expense whatsoever to said Board of Trustees, ordinary wear and tear and unusual abuse or neglect excepted.

In the event of our failure to comply with above-mentioned guarantee conditions within ten (10) day after being notified in writing by the Owner, we collectively and separately do hereby authorize the Owner to have said defective work and damages repaired or replaced and made good at our expense and will honor and pay the costs and charges therefore upon demand.

SIGNED (Subcontractor)

(Signature)

(Company Name)

(Address)

(License Number) _____ (Date of Signing)

COUNTERSIGNED (General Contractor)

(Signature)

(Company Name)

(Address)

(License Number) _____ (Date of Signing)

(Letterhead of Company)

SPECIAL EXTENDED WRITTEN GUARANTEE / WARRANTY

We hereby warrant that _____

which we have provided in _____
Name of Project

for _____
District

has been completed in accordance with Specification Section _____ and requirements of the Contract Documents.

Under the terms of this warranty, we agree to repair or replace any or all of our work, together with any other adjacent work which may be displaced or damaged by so doing, which may prove to be either patently defective in its workmanship or latently defective in its workmanship or materials within a period of _____ year(s) from date of filing the Notice of Completion of the above-named Project by the Board of Trustees of the School District without any expense whatsoever to said Board of Trustees, ordinary wear and tear and unusual abuse or neglect excepted. We also agree to repair any and all damages resulting from such defects.

In the event of our failure to comply with above-mentioned conditions within a reasonable time but in no case longer than ten (10) calendar days after being notified in writing by the Owner, we collectively and separately do hereby authorize the Owner to have said defective work and damages repaired or replaced and made good at our expense and will honor and pay the costs and charges therefore upon demand.

SIGNED (Subcontractor)

(Name)

(Address)

(License Number)

(Date of Signing)

COUNTERSIGNED (General Contractor)

(Name)

(Address)

(License Number)

(Date of Signing)

RECORD DOCUMENTS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Documents on Work;
- B. Special Conditions.

PART 2 - RECORD DRAWINGS

2.01 GENERAL:

- A. As indicated in the Contract Documents, the District will provide Contractor with one set of reproducible, full size original Contract Drawings (mylars).
- B. Contractor shall maintain at each Project Site one set of marked-up plans and shall transfer all changes and information to those marked-up plans, as often as required in the Contract Documents, but in no case less than once each month. Contractor shall submit to the Project Inspector one set of reproducible vellums of the Project Record Drawings ("As-Built") showing all changes incorporated into the Work since the preceding monthly submittal. The As-Built shall be available at the Project Site. The Contractor shall submit reproducible vellums at the conclusion of the Project following review of the blue line prints.
- C. Label and date each Record Drawing "RECORD DOCUMENT" in legibly printed letters.
- D. All deviations in construction, including but not limited to pipe and conduit locations and deviations caused by without limitation Change Orders, Construction Claim Directives, RFI's, and Addenda, shall be accurately and legibly recorded by Contractor.
- E. Locations and changes shall be done by Contractor in a neat and legible manner and, where applicable, indicated by drawing a "cloud" around the changed or additional information.

2.02 RECORD DRAWING INFORMATION:

- A. Contractor shall record the following information:
 - (1) Locations of Work buried under or outside each building, including, without limitation, all utilities, plumbing and electrical lines, and conduits.

- (2) Actual numbering of each electrical circuit to match panel schedule.
- (3) Locations of significant Work concealed inside each building whose general locations are changed from those shown on the Contract Drawings.
- (4) Locations of all items, not necessarily concealed, which vary from the Contract Documents.
- (5) Installed location of all cathodic protection anodes.
- (6) Deviations from the sizes, locations, and other features of installations shown in the Contract Documents.
- (7) Locations of underground work, points of connection with existing utilities, changes in direction, valves, manholes, catch basins, capped stubouts, invert elevations, etc.
- (8) Sufficient information to locate Work concealed in each building with reasonable ease and accuracy.

In some instances, this information may be recorded by dimension. In other instances, it may be recorded in relation to the spaces in the building near which it was installed.

- B. Contractor shall provide additional drawings as necessary for clarification.
- C. Contractor shall provide reproducible record drawings, made from final Shop Drawings marked "No Exceptions Taken" or "Approved as Noted."
- D. After review and approval of the marked-up specifications by the Project Inspector, Contractor shall provide electronic copies of the drawings (in PDF format) with one file with all of the sheets and one set of individual sheet files at the conclusion of the Project.

PART 3 - RECORD SPECIFICATIONS

3.01 GENERAL:

- A. Contractor shall mark each section legibly to record manufacturer, trade name, catalog number, and supplier of each Product and item of equipment actually installed.
- B. After review and approval of the marked-up specifications by the Project Inspector, Contractor shall provide one electronic copy of the specifications (in PDF format) at the conclusion of the Project.

PART 4 - MAINTENANCE OF RECORD DOCUMENTS

4.01 GENERAL

- A. Contractor shall store Record Documents apart from documents used for construction as follows:

- (1) Provide files and racks for storage of Record Documents.
- (2) Maintain Record Documents in a clean, dry, legible condition and in good order.

B. Contractor shall not use Record Documents for construction purposes.

PART 5 – PRODUCTS Not Used.

END OF DOCUMENT

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes general requirements and procedures for compliance with California Code of Regulations, Title 24, Part 11 California Green Building Standards Code, "CAL-Green".

- 1. Chapter 5- Non-Residential Mandatory Measures.

1.2 RELATED REQUIREMENTS

- A. Pertinent sections specifying erosion control.
- B. Section 01 6116, Volatile Organic Compound (VOC) Restrictions.
- C. Section 01 7419, Construction Waste Management and Disposal.
- D. Section 01 7700, Closeout Procedures.

1.3 DEFINITIONS

- A. CAL-Green Definitions: Certain terms are defined by CAL-Green in Chapter 5 of the code. Words and terms used in this section shall have the meanings shown therein.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Respond to questions and requests from Architect and the jurisdiction having authority regarding CAL-Green credits that are the responsibility of the Contractor, that depend on product selection or product qualities, or that depend on Contractor's procedures. Document responses as informational submittals.

1.5 SUBMITTALS

- A. CAL-GREEN Submittals: Submit CAL-GREEN submittals required by code and in other Specification Sections.
 - 1. CAL-GREEN submittals are in addition to other submittals. If submitted item is identical to that submitted to comply with other requirements, submit duplicate copies as a separate submittal to verify compliance with indicated CAL-GREEN requirements.
 - 2. Acceptable verification submittals are specified in the related sections.

SUSTAINABLE DESIGN REQUIREMENTS
SECTION 01 8113.10
3595001

PART 2 - PRODUCTS

2.1 REQUIREMENTS - GENERAL

- A. Provide products and procedures necessary to confirm CAL-GREEN compliance required in this Section. Although other Sections may specify some CAL-GREEN requirements, the Contractor shall determine additional materials, techniques, means, methods and procedures necessary to comply with CAL-GREEN requirements.

2.2 STORM WATER POLLUTION PREVENTION PLAN

- A. Section 5.106.1: Comply with requirements of this code section, local ordinances, General Conditions, Special Provisions, and related sections specifying erosion control.

2.3 OUTDOOR WATER USE

- A. Section 5.304.3.1: Irrigation Controllers: Comply with requirements of this code section, local ordinances and Section 32 8000.

2.4 CONSTRUCTION WASTE REDUCTION

- A. Section 5.408 Construction Waste Management, Diversion and Recycling: Comply with requirements of this code section, local ordinances and Section 01 7419.

2.5 BUILDING MAINTENANCE AND OPERATION

- A. Section 5.410.2.5. Documentation and Training: Provide Operations Training as required by these code sections and as specified in Section 01 7700 and Systems Manual as specified in Section 01 7700.

2.6 POLLUTANT CONTROL

- A. Section 5.504.3 Indoor Air Quality: Comply with requirements of this code section, local ordinances and Section 01 3543.
 - 1. During storage, rough installation and until final start-up of HVAC equipment, securely cover all ducts and air distribution component openings with plastic, tape, sheet metal or other methods acceptable to enforcing agency to reduce dust or debris collected in the system.
- B. Section 5.504.4 Finish Material Pollutant Control: All Finish materials shall comply with requirements of this code section, local ordinances and Section 01 6116.

PART 3 - EXECUTION

3.1 GENERAL

- A. Comply with Section 01 7419, Construction Waste Management and Disposal.

SUSTAINABLE DESIGN REQUIREMENTS
SECTION 01 8113.10
3595001

- B. Comply with execution requirements of related sections and applicable local codes and ordinances.

END OF SECTION

*p:\sacramento\3595 tracy unified school district\001-000_villalovoz es new shade structures\08 specifications\06 spec\04 final\freiler
- shade struct\01 8113.10_sustainable design requirements (cal-green).docx
Last Updated: April 8, 2019*

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Code required signage.
 - 2. Exterior building identification and other non-code signage.

1.2 RELATED REQUIREMENTS

EDIT THE FOLLOWING CROSS REFERENCES AND ONLY INCLUDE THOSE USED ON THE PROJECT

- A. Section 01 6116, Volatile Organic Compound (VOC) Restrictions; for VOC limits pertaining to adhesives, sealants, fillers, primers, and coatings.
- B. Section 01 8113, Sustainable Design Requirements, for CAL-Green **[and Collaborative for High Performance Schools (CHPS)]** general requirements and procedures.
- C. Division 23, Mechanical.
- D. Division 26, Electrical.
- E. Signage requirements included on the Drawings.

1.3 REFERENCES AND STANDARDS

- A. California Building Code, edition as noted on the drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CAL Green), edition as noted on drawings, as adopted by the California Division of the State Architect (DSA).
- C. Title 19, CCR, Article 33.01(i).
- D. American National Standards Institute (ANSI):
 - 1. A-117.1: Accessible and Usable Buildings and Facilities.
- E. ASTM International (ASTM):
 - 1. A53/A53M: Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
 - 2. A153/A153M: Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.

SIGNAGE
SECTION 10 1400
Project Number

1.4 ADMINISTRATIVE REQUIREMENTS

A. Submittal Procedures:

1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
3. Sustainable Design Submittals shall comply with the additional requirement of Section 01 8113, Sustainable Design Requirements.

B. Coordination:

1. Prior to production of shop drawings and samples, coordinate a pre-submittal conference with Architect to confirm submittal requirements, schedule, and sign review process.
2. For signs supported by or anchored to permanent construction, advise installers of anchorage devices about specific requirements for placement of anchorage devices and similar items to be used for attaching signs. Provide template for placement of sign-anchorage devices **[and electrical service]** embedded in permanent construction by other installers.

1.5 ACTION SUBMITTALS

A. Shop Drawings:

1. Scaled drawings and signage schedule for each sign indicating materials, lettering layout, and colors.

THE FOLLOWING IS REQUIRED ONLY FOR EVACUATION MAPS, EDUCATIONAL SIGNS, DIRECTORY MAPS, AND SIMILAR SIGNAGE.

- a. Digital artwork files prepared by the Architect for the Contractor's use shall be a single layer. Manipulations of the files required for subsequent use by the Contractor, such as spreads, and traps for silkscreen negatives, building plans for Emergency Evacuation Maps, or conversion to outline or EPS, shall be the responsibility of the Contractor unless explicitly agreed otherwise by the Architect.

THE FOLLOWING SUBPARAGRAPH IS REQUIRED ONLY FOR SPECIALIZED / CUSTOM SIGNS.

2. Large-scale drawing and details of custom logo and lettering. Include mounting details.
 - a. Include plans, elevations, and large-scale sections of typical members and other components.
 - b. Show mounting methods, grounds, mounting heights, layout, spacing, reinforcement, accessories, and installation details.

SIGNAGE
SECTION 10 1400
Project Number

3. Font Style. 18 point graphical example of alphabet and numerical numbers 0 through 9 of signage font style, upper and lower case letters, punctuation, 18 point scale, and black text on white paper.
- B. Product Data: Submit list and complete descriptive data of all products proposed for use. Include manufacturer's specifications, published warranty or guarantee, installation instructions, and maintenance instructions.
- C. Samples:
 1. Submit three samples of specified signage fonts to be used for visual and tactile characters including braille below the raised characters.
 2. Color Verification: Provide physical sample of each available color from the manufacturer. Include color system name and serial number, code and name as applicable.
 3. Control Samples. Samples shall be prepared on same base material to be used in fabrication. Submit one sample of each sign type. Signage types are indicated in Construction Document details. Interior signs shall be full size.
 4. Dimensional Letters: One full-size representative samples of each dimensional letter type required, showing letter style, color, and material finish and method of attachment.
 5. Symbol of Accessibility and Pictograms. Full scale sample of pictograms and symbol of accessibility to be used on sign panels and graphics.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For installer.
- B. Sustainable Design:
 1. General:
 - a. Submit information necessary to establish and document compliance with the California Green Building Standards Code.
 - b. Sustainable design submittals are in addition to other submittals.
 2. The following information shall be provided:
 - a. Adhesives and Sealants: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.
- C. Sample of manufacturer's warranty.
- D. Signage Schedule and Alphanumeric Nomenclature. As a component of shop drawings and informational submittals, verify with Architect the sign nomenclature; room names and numbers; wording of way-finding, directional and informational signage; text; and orientation of wayfinding pictorial graphics.

1.7 CLOSEOUT SUBMITTALS

- A. Warranty/Guarantee: Submit executed warranty and Subcontractor's guarantee.

SIGNAGE
SECTION 10 1400
Project Number

- B. Maintenance data for signs and sign types including maintenance manuals.

1.8 QUALITY ASSURANCE

- A. Contractor shall assure that the vendor shall be responsible for the quality of materials and workmanship of any firm acting as the vendor's subcontractor.
- B. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.
- C. Use materials and products of one manufacturer whenever possible.
- D. Materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.
- E. The adhesion of inlaid letters and symbols will be tested. See Article WARRANTY.
- F. Mockups:

THE PRE-INSTALLATION REQUIREMENTS IN THE FIRST SUBPARAGRAPH BELOW ARE TYPICALLY NOT PROVIDED BY GC AND MAY BE OMITTED. CONFIRM WITH PROJECT MANAGER IF IT IS TO BE INCLUDED AND ENFORCED BY RGA.

- 1. Prior to installation, install pre-installation paper mockup signs for review at locations designated by Architect. The job-site review is to confirm compliance with the information included on the Drawings, typical installation conditions, and determine installation locations for non-typical conditions.
- 2. Prior to installation, provide a taping pattern for sign plaques[, and pin-mounting or stud patterns for individual letter signs components].

1.9 DELIVERY, STORAGE AND HANDLING

- A. Deliver undamaged products to job in manufacturer's sealed containers and/or original bundles with tags and labels intact.
- B. Store materials in protected, dry conditions off of ground and in areas so as to not interfere with the progress of the work.
- C. Transport, store and handle in strict accord with the manufacturer's written recommendations.

1.10 FIELD MEASUREMENTS

- A. Make and be responsible for all field dimensions necessary for proper fitting and completion of work. Report discrepancies to Architect before proceeding.

1.11 WARRANTY

- A. Manufacturer: In addition to the Contractor's and Subcontractor's Guarantee, furnish Owner with manufacturer's available fully executed written warranty for signage against

all defects in materials and workmanship, including without limitation against yellowing, cracking, crazing, and other visible and performance defects for a period of 5 years.

1. Text, pictograms or symbols that can be removed from the sign face utilizing a sharp object or other conventional methods will be considered a manufacturing defect.

PART 2 - PRODUCTS

2.1 DESIGN AND PERFORMANCE CRITERIA

A. Regulatory Standards:

1. Except as otherwise specified or shown, signage shall conform to the following:
 - a. ANSI A-117.1 and the Americans with Disabilities Act (ADA).
 - b. ATBCB Design Guidelines for Signage in relation to the Americans with Disabilities Act.
 - c. California Code of Regulations, Titles 19 and 24.
 - 1) Contracted Grade 2 Braille shall be used whenever Braille symbols are specifically required. Refer to CBC Section 11B-703.3.
 - 2) All signage shall conform to CBC Section 11B-703.
 - d. Uniform Sign Code.
2. When there is a conflict between the CBC and ADA, comply with the most stringent.

B. Design Criteria: Refer to Chapter 11B of the California Building Code.

1. Raised Characters: Section 11B-703.2.
 - a. Depth: Section 11B-703.2.1.
 - b. Case: Section 11B-703.2.2.
 - c. Style: Section 11B-703.2.3.
 - d. Character Proportions: Section 11B-703.2.4.
 - e. Character Height: Section 11B-703.2.5.
 - f. Stroke Thickness: Section 11B-703.2.6.
 - g. Character Spacing: Section 11B-703.2.7.
 - h. Line Spacing: Section 11B-703.2.8.
 - i. Installation Height and Location: Section 11B-703.4.
2. Braille: Section 11B-703.3.
 - a. Contracted (Grade 2) Braille with rounded or domed dots shall be used wherever Braille is required.
 - 1) Braille dimensions in accordance with Table 11B-703.3.1.
3. Visual Characters: Section 11B-703.5.
 - a. Character Proportions: Section 11B-703.5.4.
 - b. Stroke Thickness: Section 11B-703.5.7.

SIGNAGE
SECTION 10 1400
Project Number

- c. Character Spacing: Section 11B-703.5.8.
 - d. Line Spacing: Section 11B-703.5.9.
- 4. Pictograms: Section 11B-703.6.
 - a. Pictogram Field: 11B-703.6.1.
 - 1) Characters and Braille shall not be located in the pictogram field.
 - b. Finish and Contrast: Section 11B-703.6.2.
 - 1) Pictograms and their field shall have a non-glare finish. Pictograms shall contrast with their field with either a light pictogram on a dark field or a dark pictogram on a light field.
 - c. Text Descriptors: Section 11B-703.6.3.
 - 1) Locate text descriptors directly below the pictogram field.
 - 2) Text shall be raised characters with braille directly below.
- 5. International Symbol of Accessibility: Section 11B-703.7.2.1.
- 6. Toilet Room Door Symbols: Section 11B-703.7.2.6.
- 7. Tactile Exit Signs: Tactile exit signage to comply with 1013.4 and 11B-703.4.

C. Sustainable Design:

- 1. VOC emissions for field-applied adhesives, sealants, and sealant primers must comply with limits specified in Section 01 6116.

2.2 PLASTIC SIGNS - TACTILE

A. Materials, Unless Otherwise Noted:

- 1. Manufacturer and Product: "Inlaid Tactile Sign" by Accent Signage Systems, Inc. Minneapolis, MN, 800-215-9437 as specified and the basis of design; Ellis & Ellis Sign Systems, Sacramento, CA, 916-924-1936; ASI-Modulex, Los Altos, CA, 650-940-1354; Weidner Architectural Signage, Sacramento, CA; or equal.
 - a. Sign Face: Two 1/8-inch plies with eased edges; New Hermes "Gravo-Tac," or equal.
 - 1) Total Thickness: 1/4 inch.
 - 2) Painted signs will not be accepted.
 - b. Tactile Text: Provide tactile text and "Raster" Braille at plastic tactile signage.
 - 1) Tactile text shall be inlaid into sign face 1/32-inch and raised 1/32- inch minimum above sign face surface.
 - 2) Inlaid text shall be 1-ply, 1/16-inch thick material; "Gravo-Tac" Exterior or equal.
 - 3) Provide text and graphics precisely formed, uniformly opaque to comply with relevant ADA regulations and requirements indicated for size, style, spacing, content, position and colors.
 - 4) Symbols where specified shall be International Style.
 - 5) Braille shall be Contracted (Grade 2) Braille.

SIGNAGE
SECTION 10 1400
Project Number

- a) Dots shall be 0.10-inch on centers in each cell, 0.30-inch on center between corresponding dots in adjacent cells, and 0.395-inch minimum to 0.400-inch maximum on center between corresponding dots in cell directly below.
- b) Dots shall be raised a minimum of 0.025-inch and a maximum of 0.037-inch above the background, and a base diameter of 0.059-inch minimum and 0.063-inch maximum.
- c) Dots with straight sides and flat tops are not acceptable.

IF IT IS NOT A REQUIREMENT THAT SIGNS HAVE LIGHT LETTERS ON A DARK BACKGROUND, YOU MAY OMIT THE TEXT IN PARENTHESIS.

IF YOU HAVE ANY SIGNS THAT OCCUR ON WALLS WITH DARK ACCENT COLORS, YOU SHOULD COORDINATE THESE SIGNS TO HAVE DARK LETTERS ON A LIGHT BACKGROUND.

- c. Colors: High contrast, non-glare, integral colors for graphics.
 - 1) Integral materials shall be U.V. stabilized.
 - 2) Characters, symbols and pictograms shall be in high contrast (light color) with background (dark) color and must conform to the CBC and the ADA Standards.

B. Fabrication:

- 1. Panel Appearance: Manufacturer's standard, high contrast, semi-matte colors.
- 2. Surface Texture: Matte Non-glare.
- 3. Character Style, Size and Layout Position:
 - a. Characters shall be 1-inch high, unless otherwise indicated.
 - b. The stroke of the uppercase letter "I" shall be 15 percent maximum of the height of the character.
 - c. The width of the uppercase letter "O" shall be 60 percent minimum and 110 percent maximum of the height of the uppercase letter "I".
 - d. Character style to be Sans Serif, uppercase, accompanied by Braille directly below text at all locations where raised characters are required.
 - e. Spacing between baselines of separate lines of raised characters with a message shall be 135 percent minimum and 170 percent maximum of the raised character height.
- 4. Text Schedule: Confirm text, symbols and numbering with the Architect and Owner.
- 5. Sign Size: As indicated on the Drawings or, if not shown, as reasonably required to accommodate text, symbols and Braille.
 - a. Where signs are installed on window glazing, fabricate a blank sign back to match in size and shape to sign.
 - b. Sign backs shall cover back side of sign from view through window on opposite side of sign.

SIGNAGE
SECTION 10 1400
Project Number

- c. Signs that are mounted back-to-back on glazing are to be matching in size; the smaller sign is to be increased in size as reasonably required to match the larger sign.
- 6. Sign Shape: As indicated on the Drawings.
 - a. Corners: Radiused, unless otherwise shown.
- 7. Inlaid Letter Adhesion Process: Inlaid material shall be adhered into 1/32-inch deep routed sign face utilizing the heat and pressure bonded/chemically welded process as developed by Accent Signage Systems for the specified "Inlaid Tactile Sign."
 - a. Sign manufacturers for the specified "Inlaid Tactile Sign" shall be familiar with and utilize the exact same manufacturing process developed by Accent Signage Systems.
 - b. Manufacturer must utilize the same and required equipment, products and techniques necessary to produce authentic "Inlaid Tactile Signs" as developed by Accent Signage Systems.
 - c. Other adhesive products and methods, including applied adhesive tapes will not be accepted.

REVIEW ALL THE VARIOUS SIGN TYPES BELOW AND DETERMINE IF AND WHERE YOU NEED THE SIGN. YOU MUST IDENTIFY AND SHOW THE LOCATION OF THE SIGN IN THE DRAWINGS; OTHERWISE YOU WILL NOT GET IT. DELETE SIGNS FROM THE SPECIFICATION THAT YOU DO NOT NEED

- C. Sign Types: Provide braille translation directly below the raised characters.
 - 1. Room Identification Sign: Provide as shown on the Drawings.
 - a. Provide name and room number at each door indicated.
 - b. Names and numbers to be reviewed and approved by Architect and Owner prior to fabrication.
 - c. Allow an average of 4-numbers and 14-letters for each sign.
 - d. Sign to be provided adjacent to doors as shown.
 - 2. Toilet Room Identification Sign: In addition to the specified Door Symbol, provide a Toilet Room Identification Sign at the strike side of every toilet room door.
 - a. Sign shall include an International Symbol of Accessibility, pictogram, and raised characters, specifying the room name with Braille translation below pictogram.
 - 3. Tactile Exit Sign:
 - a. Provide with text in raised characters to read: "EXIT".
 - 4. Tactile Exit Route Sign:
 - a. Text to Read: "EXIT ROUTE."
 - 5. Tactile Floor Designation Sign:
 - a. Text to Read: "FLOOR XXX."
 - b. Include raised five pointed star preceding the text at the exit discharge level.

- c. The outside diameter of the star to be same as height of the raised characters.
- 6. Tactile Stair Sign:
 - a. Text to Read: "EXIT STAIR DOWN."

THE FOLLOWING SIGN TYPES SHALL BE DESIGNATED WITH A SHEET NOTE, PROCEEDED BY THE KEYNOTE "SIGNAGE: PLASTIC SIGN, TACTILE" IN DIVISION 10]

- 7. Tactile Area for Rescue Assistance Sign:
 - a. Text: 5/8-inch high raised characters to read "AREA OF RESCUE ASSISTANCE" with International Symbol of Accessibility.
- 8. Tactile This is Not an Exit Sign:
 - a. Text: 5/8-inch high raised characters to read "THIS IS NOT AN EXIT."

2.3 PLASTIC SIGNS - NON-TACTILE

A. Materials, Unless Otherwise Noted:

Manufacturer and Product: Acrylic panel sign as manufactured and distributed by Ellis & Ellis Sign Systems, 916-924-1936, as specified and the basis of design, or equal.

- 1. Sign Face: 1/4-inch, matt finish, non-glare acrylic with subsurface vinyl and paint. Painted faces will not be accepted.

IF IT IS NOT A REQUIREMENT THAT SIGNS HAVE LIGHT LETTERS ON A DARK BACKGROUND, YOU MAY OMIT THE TEXT IN PARENTHESIS.

IF YOU HAVE ANY SIGNS THAT OCCUR ON WALLS WITH DARK ACCENT COLORS, YOU SHOULD COORDINATE THESE SIGNS TO HAVE DARK LETTERS ON A LIGHT BACKGROUND.

- 2. Colors: Colors shall match specified Tactile Signs and as selected by Architect and Owner.
 - a. Integral materials shall be U.V. stabilized.
 - b. Graphics and text shall be in high contrast (light color) with background (dark) color.

B. Fabrication:

1-INCH HIGH CHARACTERS ARE BASED ON 5'-10" MAXIMUM TO TOP OF TEXT A.F.F, AND A MAXIMUM VIEWING DISTANCE OF 9 FEET PER CBC, TABLE 11B-703.5.5. TEXT ABOVE 5'-10" MUST BE 2" HIGH MIN., AND ABOVE 10'-0" TEXT MUST BE 3" HIGH MIN.

- 1. Sign Thickness: 1/4-inch.
- 2. Character Style, Size and Layout Position:
 - a. Characters shall be a minimum of 1-inch high, unless otherwise indicated.
 - b. The stroke thickness of the uppercase letter "I" shall be 10 percent minimum and 20 percent maximum of the height of the character.

SIGNAGE
SECTION 10 1400
Project Number

- c. The width of the uppercase letter "O" shall be 60 percent minimum and 110 percent maximum of the height of the uppercase letter "I".
 - d. Letter style to be Sans Serif, uppercase.
 - e. Space characters 10 percent minimum and 35 percent maximum of height of characters, measured between two closest points of adjacent characters, excluding word spaces.
 - f. Spacing between baselines of separate lines of characters within a message shall be 135 percent minimum and 170 percent maximum of character height.
3. Text Schedule: Confirm text, symbols and numbering Architect and Owner using the shop drawing/submittal process.
4. Sign Size: As indicated on the Drawings or, if not shown, as reasonably required to accommodate text and symbols.
- a. Where signs are installed on window glazing, fabricate a blank sign back to match in size and shape to sign.
 - b. Sign backs will cover back side of sign from view through window on opposite side of sign.
5. Sign Shape: As indicated on the Drawings or, as reasonably required to accommodate the specified text and size at lettering.
- a. Corners: 1/4-inch radius, unless otherwise shown.

REVIEW ALL THE VARIOUS SIGN TYPES BELOW AND DETERMINE IF AND WHERE YOU NEED THE SIGN. YOU MUST IDENTIFY AND SHOW THE LOCATION OF THE SIGN IN THE DRAWINGS. DELETE SIGNS FROM THE SPECIFICATION THAT YOU DO NOT NEED.

C. Sign Types:

1. Toilet Room Door Symbol: Provide one of the following symbols as appropriate to the toilet room type. Toilet Room Door Symbols shall have a color contrast that is distinctly different from the color of the door. Characters, as shown, to be flush with face of symbol. The entire background color must contrast with door. A thin contrasting border around the symbol, with remainder of sign background in a non-contrasting color is not allowed.
- a. Girls: 12-inch diameter circle, with eased edges.
 - b. Boys: Equilateral triangle with sides 12-inches long, with eased edges.
 - c. Women: 12-inch diameter circle, with eased edges.
 - d. Men: Equilateral triangle with sides 12-inches long, with eased edges.
 - e. Unisex or Staff: equilateral triangle of contrasting color and super imposed on and geometrically inscribed within the face of 12-inch diameter circle, which is a contrasting color to the door. The vertices of the triangle symbol shall be located 1/4-inch maximum from the edge of the circle with the vertex pointing upward. Both the circle and triangle to have eased edges.
2. Occupancy Signs (Capacity Sign): Quantity of occupants shall be as indicated on the Drawings or as provided by Architect. Text to read as follows:

NUMBER OF OCCUPANTS INFORMATION IS PROVIDED IN A SHEET NOTE ON THE INTERIOR ELEVATIONS OF THE DRAWINGS ALONG WITH THE KEYNOTE WHICH DESCRIBES THE SIGN TYPE. SIGN IS SHOWN ON THE INTERIOR ELEVATIONS AND LOCATED BY DIMENSION, AT 5'-10" MAX. TO TOP OF TEXT.

- a. Maximum Number - General: "The number of people permitted in this room shall not exceed _____ by order of the Division of the State Architect."
- b. Rooms Used for Assembly and Dining: "The number of people permitted in this room shall not exceed _____ for Assembly and _____ for Dining by order of the Division of the State Architect."
- c. Rooms with Operable or Folding Partitions: "While partition is in the open position the number of people permitted in this room shall not exceed _____ by order of the Division of State Architect."
3. Disabled Accessible Entrance Signs: 6-inches high x 6-inches wide with International Symbol of Accessibility.
4. Assistive Listening System Sign: Provide as indicated on the Drawings.
5. Elevator Emergency Sign: Sign as approved by the State Fire Marshal, text with 5/8-inch high characters to read: "IN CASE OF FIRE DO NOT USE ELEVATOR. USE EXIT STAIRS."
 - a. Location: As shown or, if not shown, as approved by Architect.
6. Roof Access Sign:
 - a. Text: "ROOF ACCESS."
 - b. Provide at doors leading to a roof access ladder or stair.

THE FOLLOWING SIGN TYPES SHALL BE DESIGNATED WITH A SHEET NOTE, PRECEDED BY THE KEYNOTE "SIGNAGE: PLASTIC SIGN, NON-TACTILE" IN DIVISION 10, LOCATED AT 5'-10" AFF MAX. TO TOP OF TEXT.

7. Chemical Storage Sign:
 - a. Text: "CHEMICAL STORAGE."
8. Warning Signs:
 - a. Provide at roof access ladder to roof with science laboratory fume hood exhaust fans.
 - b. Text: 5/8-inch high characters to read "TOXIC FUMES ARE PRESENT ON ROOF. TURN OFF CIRCUIT BREAKERS TO FUME HOOD FANS BEFORE ACCESSING ROOF."
9. Gas Line Identification Sign:
 - a. Text: "CAUTION: GAS PIPE CONCEALED IN WALL."
 - b. Provide where gas lines are concealed in walls.
10. Floor Live Load Capacity Sign:
 - a. Text: "125 PSF MAXIMUM LIVE LOAD DESIGN FOR STAGE FLOOR."
 - b. Height of Letters: 1-1/2 inches.
 - c. Provide at Stage, where approved by Architect.
11. Ceiling Live Load Capacity Sign:
 - a. Text: "50 PSF MAXIMUM LIVE LOAD DESIGN FOR STAGE CEILING."

SIGNAGE
SECTION 10 1400
Project Number

- b. Height of Letters: 1-1/2 inches.
- c. Provide at Stage, where approved by Architect.

2.4 METAL SIGNS

A. Letter Style:

- 1. The stroke thickness of the uppercase letter "I" shall be 10 percent minimum and 20 percent maximum of the height of the character.
- 2. The width of the uppercase letter "O" shall be 60 percent minimum and 110 percent maximum of the height of the uppercase letter "I".
- 3. Letter style to be Sans Serif, uppercase.

B. Metal Reflectorized Signs:

- 1. Blue reflective vinyl background with white copy or symbol on 0.080 aluminum unless noted otherwise:
 - a. Disabled Accessible Parking Stall:
 - 1) International Symbol of Accessibility with text below to read "MINIMUM FINE \$250".
 - 2) Pole mounted.
 - b. Van Accessible Parking Stall:
 - 1) Same as Standard Accessible Parking Stall sign with text below to read "VAN ACCESSIBLE".
 - 2) Pole mounted.
- 2. Parking Lot Entrance: Text as shown on the Drawings, on dark blue background.
- 3. On-site Stop Sign: Red reflectorized vinyl background with white copy and border. Pole mounted; in compliance with State of California Business, Transportation and Housing Agency, Department of Transportation 1990 Uniform Sign Chart.

THE FOLLOWING SIGN TYPES SHALL BE DESIGNATED WITH A SHEET NOTE, PROCEEDED BY THE KEYNOTE "SIGNAGE: METAL REFLECTORIZED" IN DIVISION 10]

- 4. Directional Signs:
 - a. Colors: As selected by Architect and Owner.
 - b. Copy and locations as noted on Drawings.
 - c. Pole mounted.
- 5. Traffic Control Signs (On-site and Off-site): Signs shall comply with State of California Business, Transportation and Housing Agency, Department of Transportation 1990 Uniform Sign Chart, California Sign Chart and local ordinances. Colors as selected by Architect.

C. Metal Painted Signs: Baked enamel on steel.

- 1. Gate Sign: 4-inch high lettering in all caps to read: "EXIT".
 - a. Provide at exit gate(s) as shown.

- b. Colors: As selected by Architect.

2.5 BUILDING SIGNS

A. Cast Aluminum:

1. Manufacturer: Gemini Incorporated of Cannon Falls, MN, or equal.
2. Size: 8-inch tall x 1-1/2-inch **[1-7/8-inch]** stroke x 3/4-inch deep letters minimum, unless otherwise indicated.
3. Mounting: Studs as standard with manufacturer.
4. Font: Helvetica regular.
5. Finish shall be baked enamel.
 - a. Color as selected by Architect.
 - b. Text as specified herein and as indicated in the Drawings.

- B. Provide one each at each building, unless otherwise indicated. Verify exact text prior to fabrication and installation. **[As a minimum, text shall read as follows:**

CONFIRM SIGN TEXT AND LETTER SIZE WITH OWNER.

PREFERED: SHOW SIGN LOCATIONS AND TEXT ON ELEVATIONS AND OMIT THE FOLLOWING SUBPARAGRAPHS.

1. **Multi-Purpose: "Multi-Purpose".**
2. **Gym: "XXXXX XXXXXXXXXX Gymnasium".**
3. **Classrooms: "Math-Science-Technology Building".**
4. **Library: "Resource Center".**
5. **Administration: "Administration".]**
6. **[Text as shown on the Drawings.]**

2.6 MONUMENT SIGNS

FONT TYPE AND SIZES LISTED BELOW ARE STANDARD. EDIT IF A DIFFERENT SIZE LETTER AND FONT ARE DESIRED]

- A. Recessed Letter Formwork: Computer numerical control (CNC), router-cut, 2-pound density, polystyrene foam letters as manufactured by SignLettersOnline.com, 800-216-8129, or equal.
1. Size: 9-inch tall x 2-inch stroke x 1-inch deep letters, unless otherwise indicated,
 2. Font: Helvetica regular.
 3. Letters shall come with spacing pattern for proper alignment and spacing.

[OR]

- B. Cast Aluminum:

SIGNAGE

SECTION 10 1400

Project Number

1. Manufacturer: Gemini Incorporated of Cannon Falls, MN, or equal.
2. Size: 9-inch tall x 1-5/8-inch **[2-inch]** stroke x 3/4-inch deep letters minimum, unless otherwise indicated.
3. Mounting: Studs as standard with manufacturer.
4. Font: Helvetica regular.
5. Finish shall be baked enamel.
 - a. Color as selected by Architect.
 - b. Text as specified herein and as indicated on Drawings.

EDIT THE FOLLOWING FOR SIGN TEXT

6. Monument Sign Text: [**“School Name”, all caps.**] [**As shown on the Drawings.**]

BE SURE THAT CAST-IN-PLACE CONCRETE SIGN IS DETAILED COMPLETELY. DETAILS MUST CORRECTLY INDICATE SIGN TEXT, FONT STYLE, LETTER SIZE, LETTER STROKE WIDTH AND SPACING.

2.7 DEDICATION PLAQUE

- A. Manufacturer: A.R.K Ramos, or equal.
- B. Size and Description: 24" x 30", No. 515 border, matte dark bronze background.
- C. Font: Helvetica medium.
- D. Finish: Satin polished faces and three coats lacquer finish; A.R.K. Ramos F07, or equal.
- E. Layout:

3" high: _____ (School Name)

1" high: _____ (School District)

Board of Trustees

(to be confirmed)

Superintendent: (to be confirmed)

Director of Facilities: _____ (to be confirmed)

Architect: Rainforth Grau Architects

Contractor: (to be confirmed

3" high: (Month/Year)

- F. Final Copy: Submit final text and layout rubbing to Architect for approval.
- G. Fastenings: As recommended by the manufacturer for the mounting surface as detailed.

2.8 FLOOR-LEVEL PATHWAY MARKINGS

VERIFY WITH CBC SECTION 1013.7 AND 1013.8 FOR FLOOR-LEVEL EXIT SIGNS AND PATH MARKINGS LOCATION REQUIREMENTS. REQUIREMENTS FOR THESE TYPES OF SIGNS AND MARKINGS ARE BASED ON THE BUILDING OCCUPANCY TYPE AND FIRE SPRINKLERS.

ILLUMINATED EXIT SIGNS AND ILLUMINATED FLOOR-LEVEL EXIT SIGNS AND MARKINGS ARE SPECIFIED UNDER DIVISION 26 – ELECTRICAL. COORDINATE WITH THE ELECTRICAL ENGINEER.

IF THE PATH MARKINGS ARE NOT REQUIRED, THEN THEY SHOULD BE DELETED FROM THIS SPECIFICATION.

- A. Acceptable Manufactures: Exit Path Markings by Active Safety, Murray, Utah, 800-657-6324 as specified and the basis of design, or equal.

THE FOLLOWING INFORMATION APPEARS TO BE OUTDATED. SINCE THESE PRODUCTS ARE RARELY, IF EVER, USED ANYMORE, WE OPTED NOT TO RESEARCH CURRENT PRODUCT INFORMATION AT THIS TIME. IF REQUIRED, YOU WILL NEED TO RESEARCH WHAT IS AVAILABLE FOR YOUR PROJECT AT THE TIME.

1. Pathway Markings: Green self-illuminating photoluminescent coating on PVC panel with optional arrows and in an aluminum J-mold frame; Series 11.000 PSL, polystyrene laminate.
 - a. Size: 1 7/8" width x 52" length x 1/8" depth.
 - b. System shall be non-electrical, non-radioactive, UL 924 and ICC listed.
2. Path Marker Door Kick Plate: Die-cut, stenciled brushed aluminum faceplate with photoluminescent coating on plastic liner; Series 2002 K1800.
 - a. Plate Dimensions: 10 inches high x full width of door.
 - b. Letters: 1 inch stroke x 6 inches high.
 - c. System shall be non-electrical, non-radioactive, UL 924 and ICC listed.
 - d. Install at exit door kick plates where door is in the route of or is the designated exit to the path markings.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Prior to installation, carefully inspect and verify that the installed work of other trades is complete to the point where this installation may properly commence.
- B. Verify that specified items may be installed in accordance with the approved design.

SIGNAGE
SECTION 10 1400
Project Number

- C. In the event of discrepancy, immediately notify Architect. Do not proceed in discrepant areas until discrepancies have been fully resolved.

3.2 INSTALLATION OF SIGNS

- A. General: Locations of signs must be in accordance with the Drawings and approved shop drawings.
- B. Plastic Signs:
 - 1. General:
 - a. Provide both mechanical fasteners and either adhesive or 2-sided adhesive tape as recommended by manufacturer for given mounting substrate.
 - b. Fasteners: Minimum 4-recessed flush head tamper-proof (vandal-resistant) screws per sign.
 - 2. Wood and Metal Framed Walls: Mechanical fasteners shall be of adequate length to penetrate exterior finishes and provide secure embedment into wall structure or sheathing.

ADD NOTE TO EXTERIOR (AND INTERIOR IF APPLICABLE) ELEVATIONS AT SIGN LOCATIONS, TO REQUIRE THAT THE CONTRACTOR GRIND THE SPLIT-FACE CMU SMOOTH
--

- 3. Masonry Walls:
 - a. At split-face concrete masonry (CMU) walls, Contractor shall be responsible for providing a "bushed-down," level, rectilinear, and smooth, area, 1/2-inch larger than sign all around for flush sign mounting.
 - b. Contractor shall not grind or prep CMU wall until signs are on site and exact sign size and location are verified and approved by Architect.
- 4. Glass:
 - a. Utilize mounting adhesive and silicone where signs are mounted to glass.
 - b. Provide vinyl window sign backer to match sign face size, mounted on opposite side of glass.
 - c. Signs mounted back-to-back are to be matching in size.
 - d. Do not pre-drill signs for mechanical fastening where sign is to be mounted to glass.
- C. Pole Mounted:
 - 1. General:
 - a. Mount signs using galvanized steel carriage bolt with hex nut and washer.
 - b. Touch up bolt head with paint to match background.
 - 2. Accessible Parking Stall Sign:
 - a. Provide one sign at each stall.
 - 3. Parking Lot Entry Sign and Stop Sign: Provide sign at location and height as indicated on the Drawings.

4. Pole: ASTM A53, Grade B, hot-dip galvanized in accordance with ASTM A153.
 - a. Diameter and Height: As shown on the Drawings.
 5. Foundations: Pole mounted signs shall be mounted in concrete footing as shown on the Drawings.
- D. Building Signs and Monument Signs:
1. Install using concealed anchors appropriate to substrate material and construction conditions.
 2. Individual letters shall be held off finishes 3/4 inch with spacers or as otherwise shown on the Drawings or approved shop drawings.
- E. Dedication Plaque:
1. Installation shall be in strict conformance with referenced standards, manufacturer's written directions, as shown in the Drawings, shop drawings, and as specified.
 2. Mounting: Concealed, in compliance with manufacturer's mounting instructions.
- F. Other Signs: Use mounting method that is permanent, vandal resistant, and has been approved by the Architect.

3.3 PROTECTION

- A. Protect work and materials of this Section and other Sections prior to and during installation, and protect the installed work and materials of all other trades.
- B. In the event of damage, immediately make all repairs and replacements necessary to the approval of the Architect and at no additional cost to the Owner.

3.4 ADJUSTING AND CLEANING

- A. Remove all dust, dirt, finger marks, etc. from signs and letters using cleaning methods as recommended by manufacturer.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Toilet accessories.
 - 2. **[Bath and shower accessories.]**
 - 3. **[Janitorial accessories.]**

1.2 RELATED REQUIREMENTS

- A. Section 05 4000, Cold-Formed Metal Framing, for blocking and backing.
- B. Section 06 1000, Rough Carpentry, for blocking and backing.
- C. Section 09 3000, Tiling.
- D. **[Section 10 2113, Plastic Toilet Compartments.]**
- E. **[Section 10 2113, Metal Toilet Compartments.]**
- F. **[Section 10 2113, Composite Toilet Compartments.]**
- G. Division 26, Electrical.

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the state Architect (DSA).
- B. California Green Building Standards Code (CAL Green), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Submittal Procedures:
 - 1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
 - 2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
- B. Coordination: Coordinate with other trades as required to ensure proper and adequate provision in framing and wall finish for the installation of the selected toilet accessories in the locations required including recessed items)

TOILET ACCESSORIES
SECTION 10 2813
PROJECT NUMBER

1.5 ACTION SUBMITTALS

- A. Shop Drawings: Submit showing parts, connections and anchorages, adjacent materials, fully dimensioned and noted.
- B. Product Data: Submit list of each required accessory and complete descriptive data of products proposed for use. Include manufacturer's specifications, published warranty, installation instructions, and maintenance instructions.

1.6 INFORMATIONAL SUBMITTALS

- A. Sample of manufacturer's warranty.

1.7 CLOSEOUT SUBMITTALS

- A. Warranty/Guarantee: Submit executed warranty and Subcontractor's guarantee.
- B. Keys for lockable accessories.
- C. Maintenance data and operating instructions.

1.8 QUALITY ASSURANCE

- A. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.
- B. Use materials and products of one manufacturer whenever possible.
- C. All materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.

1.9 DELIVERY, STORAGE AND HANDLING

- A. Deliver undamaged products to job in manufacturer's sealed containers and/or original bundles with tags and labels intact.
- B. Store materials in protected, dry conditions off of ground and in areas so as to not interfere with the progress of the Work.
- C. Transport, store and handle in strict accord with the manufacturer's written recommendations.

1.10 FIELD CONDITIONS

- A. Make and be responsible for field dimensions necessary for proper fitting and completion of Work. Report discrepancies to Architect before proceeding.
- B. Verify wall depths are adequate for each item prior to ordering. Notify Architect of conflicts or discrepancies.

1.11 WARRANTY

- A. Manufacturer: In addition to the Contractor's and Subcontractor's Guarantee, furnish Owner with manufacturer's fully executed written warranty for toilet accessories against defects in materials and workmanship, agreeing to replace and install toilet accessories at no additional cost to the Owner, within warranty period as follows:
1. Hand and Hair Dryer:
 - a. Motor Brushes: For a period of 3 years.
 - b. All Other Parts: For a period of 10 years.
 2. Glass Mirrors: For a period of 10 years.
 3. All Other Accessories: For a period of 3 years.

PART 2 - PRODUCTS

2.1 OWNER FURNISHED CONTRACTOR INSTALLED PRODUCTS

- A. The following products will be furnished by the Owner for installation by Contractor. Provide adequate blocking for attachment. Miscellaneous items are to be provided and installed by Contractor.

EDIT THE FOLLOWING

1. Soap Dispensers
2. Paper Towel Dispensers.
3. Toilet Tissue Dispensers.

2.2 DESIGN AND PERFORMANCE CRITERIA

- A. Conform to applicable requirements of ADA and CBC for accessibility. When in conflict, conform to the most stringent.

2.3 MANUFACTURERS

- A. Accessories: Bobrick Washroom Equipment Inc. or Bradley Corporation as specified and the basis of design, unless otherwise noted, or equal.
1. Manufactured accessories not specified shall require approval as a substitution to be considered equal. Refer to substitution requirements specified in Section 01 3300, Submittal Procedures.
 2. Although multiple manufacturers may be specified for a specific accessory, all accessories shall be the product of a single manufacturer, unless otherwise specified or approved.

ALL ACCESSORIES SHALL BE SUBMITTED TO AND APPROVED BY THE OWNER PRIOR TO FINALIZING THIS SECTION.

TOILET ACCESSORIES
SECTION 10 2813
PROJECT NUMBER

2.4 MANUFACTURED UNITS

- A. General:
 - 1. Locked Dispensing Units: Key alike for all accessories.
- B. Grab Bars: 18 gauge 1-1/2 inch outside diameter, type 304 stainless steel welded to 1/8 inch type 304 solid stainless steel wall plates; Bobrick Series B-6806, Bradley 812 Series, or equal.
 - 1. Configurations and Lengths: As shown.
 - 2. Grab bar shall withstand a 250 pound point load.
 - 3. Joints ground and polished.
 - 4. Finish on Exposed Surfaces: Satin.
 - 5. Fastening: Concealed, vandal resistant.
- C. Mirror, Glass: 1/4 inch thick No. 1 (mirror glazing) quality, clear polished float glass, with protective copper backing over silver coating and non-metallic elastic paint; Bobrick Series B-165, Bradley 781 Series, or equal.
 - 1. Edges shall be protected by friction-absorbing filler strips.
 - 2. Size, Unless Otherwise Shown:
 - a. Kindergarten and Elementary Toilet Rooms: 18 inches wide x 30 inches high.
 - b. Middle School/Junior High, High School, College and Staff Toilet Rooms: 18 inches wide x 36 inches high.
 - 3. Safety Backing: Full size, shock absorbing, water-resistant, non-abrasive, 3/16 inch thick polyethylene padding.
 - 4. Backs: Galvanized steel backing with formed edges, integral horizontal hanging brackets. Provide with theft-resistant concealed hangers.
 - 5. Frames: Stainless steel, 1/2 inch x 1/2 inch x 3/8 inch channel with bright polish finish.
 - a. Use theft-resistant screws in countersunk holes where screws are exposed.
 - b. Corners: Square and mitered, weld or mechanically fastened to tight hairline joint, or frame as one piece with rounded corners.
- D. Mirror, Stainless Steel: Vandal-resistant stainless steel, frameless mirror; type 430, minimum 20 gauge stainless steel with bright polished finish, and 1/4 inch return; Bobrick Model B-942, or Bradley Model SA05.
 - 1. Mounting: Tamper-resistant screws.
- E. Recessed Toilet Paper Dispenser at Disabled Accessible Locations: Multi-roll; Bobrick B-3888.
- F. Recessed Toilet Paper Dispenser at Disabled Accessible Locations - Kindergarten/Elementary: Dual-roll, with anti-theft spindle; Bobrick B-6977, Bradley 5124-52.

TOILET ACCESSORIES
SECTION 10 2813
PROJECT NUMBER

- G. Surface Mounted Toilet Paper Dispenser: 22 gauge, type-304 stainless steel, satin finish with vandal resistant tumbler lock; Bobrick B-272, Bradley 515.

[EDIT NOTE: IF THE LOOK OF THE "CONTURA SERIES" IS OF IMPORTANCE TO YOUR PROJECT, YOU SHOULD COMPARE THE LOOK OF THE BRADELY 5A40 BEFORE INCLUDING IT IN THE SPECIFICATION.]

- H. Surface-Mounted Toilet Seat Cover Dispenser: Bobrick "Contura Series" B-4221, Bradley 5A40-11.
- I. Mop and Broom Holder: Bobrick B-239 x 34 inches long; Bradley 9933.
1. Locations: One each at each Janitor and/or Storage Room.
- J. Liquid Soap Dispenser: Provide one at each lavatory.

EDIT THE FOLLOWING IF NOT BOTH USED ON PROJECT.

1. Recessed: Bobrick B-4063.
- a. Capacity: 50 fluid ounces.
2. Surface Mounted: Bobrick B-4112.
- a. Capacity: 40 fluid ounces.
- K. Recessed Powdered Soap Dispenser: Type-304 stainless steel, satin finish; Bobrick B-341.
1. Door shall have concealed stainless steel piano hinge and tumbler lock.
2. Capacity: 50 fluid ounces.
- L. Paper Towel Dispenser: Provide recessed paper towel dispenser except where an obstruction precludes recessing, or if otherwise noted.
1. Recessed: Bobrick B-359 with 130 "Towelmate."
2. Surface Mounted: Bobrick B-262 with 130 "Towelmate."
- M. Recessed Hand **[and Hair]** Dryer: UL listed, cast-iron with vitreous enamel finish; Bobrick "AirCraft" B-750.
1. Color: White.
2. Operation: Automatic sensor; Bobrick "AutoPilot."
3. Power: 115V AC, 20 Amp, 50/60 Hz, 2300 Watts.
- N. Sanitary Napkin / Tampon Dispenser: Coin operated. Provide recessed unit except where obstruction precludes recessing.
1. Recessed: Bobrick B-3706, Bradley 407.
2. Surface Mounted: Bobrick B-2706, Bradley 407-11.

TOILET ACCESSORIES
SECTION 10 2813
PROJECT NUMBER

SPECIFY THE FOLLOWING SANITARY / TAMPON DISPENSERS WHERE COIN FREE OPERATION IS REQUIRED PURSUANT TO ASSEMBLY BILL 10.

- O. Sanitary Napkin/Tampon Dispenser: Coin free operation. Provide semi-recessed unit except where obstruction precludes recessing.
 - 1. Semi-Recessed: Bobrick B-370634C.
 - 2. Surface-Mounted: Bobrick B-2706C.
- P. Sanitary Napkin Disposal:

SPECIFY PARTITION MOUNTED DISPOSAL IN STALLS THAT ARE 32" OR LESS IN WIDTH.

- 1. Partition Mounted for Two Toilet Compartments: Bobrick B-354, Bradley 4721-15.
 - 2. Surface Mounted for Single Compartment: Bobrick B-270, Bradley 4781-11.
- Q. Shower Seat: Folding type, solid phenolic with slots, stainless steel frame, lockable in upright position until released by pulling the top of the seat away from the wall; Bobrick B-5181.
- R. Shower Rod: Extra heavy duty, length as shown on the Drawings, with shower curtain and curtain hooks; Bobrick B-6047, Bradley 9531.
- S. Curtain Hooks: Bobrick B-204-1, Bradley 9536.
- T. Vinyl Shower Curtains: Bobrick B-204-2, Bradley 9537.
- U. Hook Strip: Vandal-resistant, stainless steel; Bobrick B-985, Bradley SA41.

SELECT ONE OF THE FOLLOWING TWO SHELF PRODUCTS, UNLESS BOTH WIDTHS ARE USED

- V. **[Shelf: Surface mounted stainless steel shelf, 5 inches wide x length shown on Drawings; Bobrick B-295, Bradley 755.]**
- W. **[Shelf: Surface mounted stainless steel shelf, 6 inches wide x length shown on Drawings. Bobrick B-296, Bradley 756.]**

2.5 FASTENINGS

- A. Toilet accessories shall be complete with required fastenings.
- B. Fastenings shall either harmonize with the item being fastened, or be of the concealed type.
- C. Exposed fastenings shall be theft and vandal-resistant.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Prior to installation of the Work of this Section, carefully inspect and verify that the installed Work of other trades is complete to the point where this installation may properly commence.
- B. Verify that specified items may be installed in accordance with the approved design.
- C. In the event of discrepancy, immediately notify the Architect. Do not proceed in discrepant areas until discrepancies have been fully resolved.
- D. **[Verify that wiring for hair [hand] dryers is in place.]**

3.2 PREPARATION

- A. The Contractor shall provide recesses, anchorage and back-up blocking in sizes and in locations as required for proper installation of accessories. Coordinate with other trades where necessary to make provisions for installation.
- B. Securely anchor items in place in locations and at mounting heights indicated. Where specific dimensions are not noted, installation shall be approved by the Architect.
- C. Securely fasten grab bar mounting plates to solid framing or blocking, in accordance with CBC.
- D. Provide cut-outs in toilet partitions for napkin disposal units as required.

3.3 INSTALLATION

- A. Install fixtures, accessories and items in accordance with manufacturers' printed instructions where shown or as approved by Architect.
- B. Mount surface-mounted accessories to solid backing or blocking.
- C. Install plumb and level, securely and rigidly anchored to substrate.
- D. Use concealed vandal-resistant fastenings wherever possible.
 - 1. Adhesive installation not permitted.
 - 2. Provide anchors, bolts and other necessary fasteners, and attach accessories securely to walls or toilet partitions as recommended by manufacturer for each item and each type of substrate condition.
- E. Grab bars: Solidly anchor grab bars to withstand minimum downward pull of 500 pounds between any 2 supports after installation.
- F. Verify type, location and attachment methods of items furnished by Owner to ensure proper preparation of substrate for solid attachment of accessories.
- G. Sealants: Comply with requirements of Section 07 9200, Joint Sealants.

TOILET ACCESSORIES
SECTION 10 2813
PROJECT NUMBER

1. Apply behind toilet accessories as necessary to ensure sanitary and watertight integrity of surfaces.
2. Conceal sealants.

3.4 CLEANING AND ADJUSTING

- A. Upon completion of installation, remove manufacturer's temporary labels, marks of identification.
- B. Thoroughly wash surfaces, remove foreign materials, polish surfaces.
- C. Leave entire accessories in neat, orderly, clean, acceptable condition as approved.
- D. Replace damaged parts, surfaces which are not free from imperfections.

3.5 PROTECTION

- A. Protect Work and materials of this Section prior to and during installation, and protect the installed Work and materials of other trades.
- B. In the event of damage, make repairs and replacements necessary to the approval of the Architect at no additional cost to the Owner.
- C. Exposed finish shall be free from scratches, dents, permanent discolorations and other defects in workmanship or material.

END OF SECTION

s:\master specifications\division 10 - specialties\10 2813_toilet accessories.docx
Last Updated: April 1, 2021

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Engineered fill materials.
 - 2. Imported engineered fill material.
 - 3. Landscape backfill material'
 - 4. Decomposed granite.
 - 5. Aggregate base.

1.2 RELATED REQUIREMENTS

- A. Section 01 5000, Temporary Facilities and Controls.
- B. Section 01 8113, Sustainable Design Requirements, for CAL-Green **[and Collaborative for High Performance Schools (CHPS)]** general requirements and procedures.
- C. Section 31 2333, Trenching and Backfilling.
- D. Section 32 1200, Asphalt Concrete Paving.
- E. Section 32 1600, Site Concrete.
- F. Section 33 0000, Utilities
- G. Section 33 4000, Storm Drainage Utilities.

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CAL Green), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- C. Local Jurisdiction: Any work within the street, highway or right-of-way shall be performed in accordance with the requirement of the governmental agencies having jurisdiction, and shall not begin until all of those governing authorities have been notified.
- D. ASTM International (ASTM):
 - 1. D698-00 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures, Using 5.5 lb (2.49 Kg) Rammer and 12 inch (304.8 mm) Drop.
 - 2. D1556-00 - Test Method for Density of Soil in Place by the Sand-Cone Method.
 - 3. D1557-02e2 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 10 lb. (4.54 Kg) Rammer and 18 inch (457 mm) Drop.

EARTHWORK
SECTION 31 0000
3595001

4. D3017-05 Test Methods for Moisture Content of Soils and Soil-Aggregate Mixture by Nuclear Methods (Shallow Depth).
5. D422-63(2007) e1 Test Method for Particle Size Analysis of Soil.
6. D4318-05 Test Method for Liquid Limit, Plastic Limit, and Plasticity Limit.

E. CALTRANS Standard Specifications Section 17.

F. CAL-OSHA, Title 8, Section 1590 (e).

1.4 ADMINISTRATION REQUIREMENTS

A. Submittal Procedures:

1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
3. Sustainable Design Submittals shall comply with the additional requirements of Section 01 8113, Sustainable Design Requirements.

B. Site Visitation: All bidders interfacing with existing conditions shall visit the site prior to bid to verify general conditions of improvements. Discrepancies must be reported prior to the bid for clarification.

1.5 ACTION SUBMITTALS

A. Provide supplier's descriptive literature for all products to demonstrate compliance with specified attributes.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Contractor / Installer.

1.7 CLOSEOUT SUBMITTALS

A. Guarantee: Submit subcontractor's guarantee.

1.8 QUALITY ASSURANCE

- A. Contractor / Installer shall have been in business for five (5) years providing/finishing similar size projects and complexity.
- B. Contractor shall be solely responsible for all subgrades built. Failures resulting from inadequate compaction or moisture content are the responsibility of the contractor. Contractor shall be solely responsible for any and all repairs.
- C. The representatives of the Owner's testing lab will not act as supervisor of construction, nor will they direct construction operations. Neither the presence of the Owner's testing lab representatives nor the testing by the Owner's testing lab shall excuse the contractors or subcontractors for defects discovered in their work during or following completion of

the project. Correcting of inadequate compaction or moisture content is the sole responsibility of the contractor.

- D. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.
- E. All materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.
- F. Tests (See Part 3, Article "Testing and Observation" for Compaction Testing).

1.9 DELIVERY, STORAGE AND HANDLING

- A. Transport, store and handle in strict accord with the local jurisdiction.

1.10 FIELD CONDITIONS

1.11 EXISTING SITE CONDITIONS

- A. Contractor shall acquaint himself with all site conditions. If unknown active utilities are encountered during work, notify Architect promptly for instructions. Failure to notify will make Contractor liable for damage to these utilities arising from Contractor's operations subsequent to discovery of such unknown active utilities.
- B. Existing civil, mechanical and electrical improvements are shown on respective site plans to the extent known. Should the Contractor encounter any deviation between actual conditions and those shown, he is to immediately notify the Architect before continuing work.

1.12 ON SITE UTILITY VERIFICATION AND REPAIR PROCEDURES

- A. Ground-breaking requirements:
 - 1. All underground work performed by a Contractor must be authorized by the District's Construction Manager or the Low Voltage Consultant prior to start of construction.
 - 2. The Contractor is to obtain and keep the original School's construction utility site plans on site during all excavation operations. Contractor can contact the District's Construction Manager, Facilities Manager, or the Low Voltage Consultant to procure the drawings.
- B. Underground Utility Locating:
 - 1. The contractor shall hire an Underground Utility Locating Service to locate existing underground utility pathways in areas effected by the scope of work for excavation.
 - 2. Contractor must use an underground utility locator service with a minimum of 3 years experience. The equipment operator must have demonstrated experience. Contact Norcal Underground Locating (800/986-6722) or Precision Locating (800/577-7324)

EARTHWORK
SECTION 31 0000
3595001

3. The Underground Utility Locator Service must have the use of equipment with the ability to locate by means of inductive clamping, induction, inductive metal detection, conductive coupling, or TransOnde (Radiodetection) to generate signals, passive locating (free scoping) for "hot" electric, and metal detector.
4. The Underground Utility Locator Service must be able to locate existing utilities at a depth of at least 72".
5. The Underground Utility Locator Service must be able to locate but are not limited to locating the following types of utility pathways:
 - a. All conduit pathways containing 110 volt or greater 50-60Hz electrical wire.
 - b. All conduit pathways containing an active cable TV system.
 - c. All conduit pathways containing wire or conductor in which a signal can be attached and generated without damaging or triggering the existing systems.
 - d. All empty conduit pathways or pipe in which a signal probe or sonde (miniature transmitter) can be inserted.
 - e. All conduit pathways containing non-conductive cables or wires in which a signal probe or sonde (miniature transmitter) can be inserted.
 - f. All plastic and other nonconductive water lines in which a TransOnde Radiodetection) or other "transmitter" can be applied to create a low frequency pressure wave (signal) without damaging or triggering the existing systems.
 - g. All copper or steel waterlines and plastic or steel gas lines.
6. All markings made by the Underground Utility Locator Service or other shall be clear and visible.
7. The contractor shall maintain all markings made by Underground Utility Locator Service or other throughout the entire length of the project.
8. The Underground Utility Locator Service shall provide the contractor with two sets of maps showing the location of utilities and average depth. They will be referenced to permanent buildings. Contractor will deliver one copy to the district at no additional charge.
9. Contractor is responsible to contact Underground Service Alert (U.S.A. 800/227-2600) and receive clearance prior to any excavation operations.
10. Contractor shall inform the (District's Construction Manager)(Architect)(Owner) no later than five (5) days prior to the date scheduled for the utility locator service to be on site.

1.13 PROTECTION

- A. Adequate protection measures shall be provided to protect workmen and passers-by on and off the site. Adjacent property shall be fully protected throughout the operations. Blasting will not be permitted. Prevent damage to adjoining improvements and properties both above and below grade. Restore such improvements to original condition should damage occur. Replace trees and shrubs outside building area disturbed by operations.
- B. In accordance with generally accepted construction practices, the Contractor shall be solely and completely responsible for working conditions at the job site, including safety

of all persons and property during performance of the work. This requirement shall apply continuously and shall not be limited to normal working hours.

- C. Any construction review of the Contractor's performance conducted by the Geotechnical Engineer is not intended to include review of the adequacy of the Contractor's safety measures, in, on, or near the construction site.
- D. Provide shoring, sheeting, sheet piles and or bracing to prevent caving, erosion or gullyng of sides of excavation.
- E. Surface Drainage: Provide for surface drainage during period of construction in manner to avoid creating nuisance to adjacent areas. The contractor shall make a reasonable effort on a daily basis to keep all excavations and the site free from water during entire progress of work, regardless of cause, source, or nature of water.
- F. Adjacent streets and sidewalks shall be kept free of mud, dirt or similar nuisances resulting from earthwork operations.
- G. The site and adjacent influenced areas shall be watered as required to suppress dust nuisance. Dust control measures shall be in accordance with the local jurisdiction.
- H. Trees: Carefully protect existing trees that are to remain. Provide temporary irrigation as necessary to maintain health of trees.

1.14 SEASONAL LIMITS

- A. No fill material shall be placed, spread or rolled during unfavorable weather conditions. When work is interrupted by rains, fill operations shall not be resumed until field tests indicate that moisture content and density of fill are satisfactory.
- B. Excessively wet fill material shall be bladed and aerated per Article "Subgrade Preparation".

1.15 TESTING

- A. General: Refer to Section 01 4523 - TESTING AND INSPECTION SERVICES, AND STRUCTURAL TESTS AND INSPECTIONS LIST, DSA-103.
- B. Geotechnical Engineer: Owner is retaining a Geotechnical Engineer to determine compliance of fill with Specifications, and to direct adjustments in fill operations. Costs of Geotechnical Engineer will be borne by Owner; except those costs incurred for re-tests or re-inspection will be paid by Owner and backcharged to Contractor.
 - 1. If Contractor elects to process or mine onsite materials for use as Suitable Fill, Aggregate Sub Base, Aggregate Base, Rock, Crushed Rock or sand the cost of all testing of this material shall be paid for by the Contractor.
 - 2. Testing of import fill for compliance with Department of Toxic Substance Control (DTSC) shall be paid for by the Contractor.

**EARTHWORK
SECTION 31 0000
3595001**

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Engineered Fill Materials: All fill shall be of approved local materials supplemented by imported fill if necessary. "Approved" local materials are defined as local soils tested and approved by Geotechnical Engineer free from debris, and concentrations of clay and organics; and contain rocks no larger than 3-inches in greatest dimension. The soil and rock should be thoroughly blended so that all rock is surrounded by soil. This may require mixing of the soil and rock with a dozer prior to placement and compaction. Clods, rocks, hard lumps or cobbles exceeding 3-inches in final size shall not be allowed in the upper 6 inches of any fill. Native clay or clayey soils will not be permitted within the upper 12 inches of building pad areas or paved areas.
- B. Imported Engineered Fill Material: Imported fill may be required to complete work. Proposed import fill material shall meet the above requirements; shall be similar to the native soils. Import fill shall meet the above requirements; shall have plasticity index of 20 or less; an Expansion Index of 15 or less; be free of particles greater than 3-inch (3") in largest dimension; be free of contaminants and have corrosion characteristics within the acceptable limits. All import fill material shall be tested and approved by Soils Engineer prior to transportation to the site. Proposed fill material shall comply with DTSC guidelines to include Phase 1 environmental site assessment and related tests. Refer to the October 2001 DTSC Information Advisory for clean imported fill material.
1. DTSC TESTING: Site work contractor is to coordinate testing with an analytical lab, hired by the owner, licensed by the State of California for the DTSC testing. The costs associated with testing will be paid by the contractor.
 2. DTSC testing shall include documentation as to the previous land use, location, and history. Soils shall be analyzed for all compounds of concern to ensure the imported soil is uncontaminated and acceptable. Testing shall be performed per the recommendations included in DTSC Imported Fill Advisory (http://www.dtsc.ca.gov/Schools/upload/SMP_FS_Cleanfill-Schools.pdf). Soils shall be tested prior to import to the project site.
 3. Lab shall determine geographically which tests and analysis comparison will be appropriate for the testing. (CAM 17 / Title 22); (RWQCB) Regional Water Quality Control Board; or (OEHHA) Office of Environmental Health Hazard Assessment.
 4. Frequency of testing shall be conducted in accordance with DTSC's Imported Fill Advisory as follows;

Fill Material Sample Schedule	
Area Of Individual Borrow Area	Sampling Requirements
2 Acres or less	Minimum of 4 samples
2 to 4 Acres	Minimum of 1 sample every ½ acre
4 to 10 Acres	Minimum of 8 samples

**EARTHWORK
SECTION 31 0000
3595001**

Greater than 10 Acres	Minimum of 8 locations with 4 subsamples per location
-----------------------	---

Volume of Borrow Area Stockpile	
Up to 1,000 Cubic Yards	1 sample per 250 cubic yards
1,000 to 5,000 Cubic Yards	4 samples for the first 1000 cubic yards + 1 sample per each additional 500 cubic yards
Greater than 5,000 Cubic Yards	12 samples for the first 5,000 cubic yards + 1 sample per each additional 1,000 cubic yards

5. Reports/ Documentation
 - a. Results of the testing analysis shall be sent to the Owner; Architect; Project Inspector, Project Civil Engineer, DTSC, and DSA. Letter shall reference DSA file and application numbers.
- C. Landscape Backfill Material:
 1. The top 3" of native topsoil stripped from the site may be used for landscape backfill material.
- D. Water: Furnish all required water for construction purposes, including compaction and dust control. Water shall be potable.
- E. Aggregate Base: Provide Class 2 3/4" Aggregate Base conforming to standard gradation as specified in Cal Trans Standard Specifications, Section 26,-1.02A.
- F. Decomposed Granite: Decomposed Granite shall be well graded mixture of fine to 1/8" particles in size with no clods. The material shall be free of vegetation, other soils, debris and rock. The material shall be redish-tan to tan in color.
- G. Decomposed Granite Solidifier: PolyPavement or equal.

PART 3 - EXECUTION

3.1 INSPECTION LAYOUT AND PREPARATION

- A. Prior to installation of the work of this Section, carefully inspect and verify by field measurements that installed work of all other trades is complete to the point were this installation may properly commence
- B. Layout all work, establish grades, locate existing underground utilities, set markers and stakes, setup and maintain barricades and protection facilities; all prior to beginning

**EARTHWORK
SECTION 31 0000
3595001**

actual earthwork operations. Layout and staking shall be done by a licensed Land Surveyor or Professional Civil Engineer.

- C. Verify that specified items may be installed in accordance with the approved design.
- D. In event of discrepancy, immediately notify Owner and the Architect. Do not proceed in discrepant areas until discrepancies have been fully resolved.

3.2 PERFORMANCE

A. GENERAL:

- 1. General: Do all grading, excavating and cutting necessary to conform finish grade and contours as shown. All cuts shall be made to true surface of subgrade.
- 2. Archaeological Artifacts: Should any artifacts of possible historic interest be encountered during earthwork operations, halt all work in area of discovery and immediately contact the Architect for notification of appropriate authorities.
- 3. Degree of Compaction: Percentage of maximum density, hereinafter specified as degree of compaction required, means density equivalent to that percentage of maximum dry density determined by ASTM D1557 Compaction Test method, and such expressed percentage thereof will be minimum acceptable compaction for specified work.
- 4. Moisture Content: Moisture content shall be as noted below and as called for on the plans. Moisture content shall be maintained until subgrade is covered by surfacing materials.

3.3 DEMOLITION, DISPOSAL AND DISPOSITION OF UNDESIRABLE MAN-MADE FEATURES

- A. All other obstructions, such as abandoned utility lines, septic tanks, concrete foundations, and the like shall be removed from site. Excavations resulting from these removal activities shall be cleaned of all loose materials, dish shaped, and widened as necessary to permit access for compaction equipment. Areas exposed by any required over-excavation should be scarified to a depth of 12", moisture-conditioned to near optimum moisture content, and recompacted to at least 95% of the maximum dry density.

3.4 TESTING AND OBSERVATION

- A. All grading and earthwork operations shall be observed by the Geotechnical Engineer or his representative, serving as the representative of the Owner.
- B. Field compaction tests shall be made by the Geotechnical Engineer or his representative. If moisture content and/or compaction are not satisfactory, Contractor will be required to change equipment or procedure or both, as required to obtain specified moisture or compaction. Notify Geotechnical Engineer at least 48 hours in advance of any filling operation.
- C. Earthwork shall not be performed without the notification or approval of the Geotechnical Engineer or his representative. The Contractor shall notify the Geotechnical Engineer at least two (2) working days prior to commencement of any aspect of the site earthwork.

- D. If the Contractor should fail to meet the compaction or design requirements embodied in this document and on the applicable plans, he shall make the necessary readjustments until all work is deemed satisfactory, as determined by the Geotechnical Engineer or Architect/Engineer.
- E. After each rain event Geotechnical Engineer shall test fill material for optimum moisture. Do not place any fill material until desired moisture is achieved.

3.5 CLEARING AND GRUBBING

- A. Prior to grading, remove all debris off-site. Remove trees and brush including the root systems. Holes resulting from tree and brush removal should be prepared and backfilled in accordance with paragraphs 3.7, 3.8, 3.9, and 3.10. This may require deepening and/or widening the holes to adequately remove disturbed soil and provide room for compaction equipment. Strip the surface of all organics. Strippings meeting the requirements of Section 32 9000 may be used in landscape areas only.

3.6 CUTTING

- A. Building pads that are located within a cut/fill transition area will have to be overexcavated to provide a semi-uniform fill beneath the building pad. The portions of building pads located in cut areas shall be overexcavated to provide no more than 1 foot difference in fill placed in the same building pad.
- B. Do all cutting necessary to bring finish grade to elevations shown on Drawings.
- C. When excavation through roots is necessary, cut roots by hand.
- D. Carefully excavate around existing utilities to avoid unnecessary damage. The contractor shall anticipate and perform hand work near existing utilities as shown on the survey, without additional claims or cost.

3.7 STRUCTURAL EXCAVATION

- A. General: Excavate to bear on firm material at contract depth shown on Structural Drawings.
- B. Footings: All footing excavations shall be of sufficient width for installation of formwork, unless earth will retain its position during concreting. All portions of footings above grade must be formed. In the event that footings are placed against earth, footing widths below grade shall be increased 2 inches from those shown on Drawings and positive protection shall be provided for top corners of trench.
- C. Unsuitable Ground: Any errors in structural excavation, soft ground, or clay soils found when excavating shall be reported to Architect. In no case shall work be built on any such soft or clayey unsuitable surface without direction from the Architect. Restore excavations to proper elevation with engineered fill material compacted to 95% of dry density.

**EARTHWORK
SECTION 31 0000
3595001**

3.8 SUBGRADE PREPARATION

- A. Grade compact and finish all subgrades within a tolerance of 0.10' of grades as indicated on Drawings and so as not to pool water. Subgrade within building pads and concrete walks shall be within 0.05' of grades indicated.
- B. After clearing, grubbing and cutting, subsurface shall be plowed or scarified to a depth of at least 12", until surface is free from ruts, hummocks or other uneven features. Moisture condition to 2% above optimum moisture content and recompact to at least 95% of the maximum dry density as determined by ASTM Test Method D1557. If the existing soils are at a water content higher than specified, the contractor shall provide multiple daily aerations by ripping, blading, and/or discing to dry the soils to a moisture content where the specified degree of compaction can be achieved. After seven consecutive working days of daily aerations, and the moisture content of the soil remains higher than specified, the contractor shall notify the architect. If the existing soils have a moisture content lower than specified, the contractor shall scarify, rip, water and blade existing soil to achieve specified moisture content. The contractor shall make proper allowance in schedule and methods to complete this work.
- C. After subgrade for fill within building pad area or within paved areas has been cleared, plowed and scarified, it shall be disked or bladed until uniform and free from large clods, brought to 2% above optimum moisture content and compacted to not less than 95% of maximum dry density, as determined by ASTM Test Method D1557, and such expressed percentage thereof will be minimum acceptable density for specified work.
- D. Subgrade in areas to receive landscaping shall be compacted to (85%).
- E. Where Contractor over-excavates building pads through error, resulting excavation shall be recompacted as engineered fill at Contractor's expense.

3.9 PLACING, SPREADING AND COMPACTING FILL MATERIAL IN BUILDING PAD AND PAVEMENT AREAS

- A. Selected fill material shall be placed in layers which, when compacted, shall not exceed 6 inches in compacted thickness. Each layer shall be spread evenly and thoroughly mixed to insure uniformity in moisture content.
- B. Selected fill material shall be moisture-conditioned to specified moisture content. Selected fill material shall be unfrozen. When moisture content of fill material is below that specified, add water until proper moisture content is achieved. When moisture content is above that specified, aerate by blading or other methods mentioned in 3.08 B until moisture content is satisfactory.
- C. After each layer has been placed, mixed and spread evenly, it shall be thoroughly compacted to a minimum of 90% as determined by the ASTM D1557 Compaction Test. Compact each layer over its entire area until desired density has been obtained.
- D. Recomposition of Fill in Trenches and Compaction of Fill Adjacent to Walls: Where trenches must be excavated, backfill with material excavated. Place in lifts that when compacted do not exceed 6", moisture conditioned to (optimum)(2% above optimum)

moisture content, and compact to a minimum of 90% relative compaction in building pad and paved areas, and to 90% relative compaction in landscape areas.

- E. Jetting of fill materials will not be allowed.

3.10 FINAL SUBGRADE COMPACTION

- A. Building Pads: Upper 12" of all final building pad subgrades (including future buildings) shall be uniformly compacted at specified moisture content to at least 90% of maximum dry density, as determined by ASTM D1557 Compaction Test, regardless of whether final subgrade elevation is attained by filling, excavation, or is left at existing grade. After acceptance of final compaction test, contractor shall maintain the required moisture content of subgrade until concrete flatwork is placed.
- B. Paved Areas: Upper 12" of all final subgrades supporting pavement sections and all other flatwork shall be brought to specified moisture content and shall be uniformly compacted to not less than 95% of maximum dry density, regardless of whether final subgrade elevation is attained by filling, excavation, or is left at existing grade. After acceptance of final compaction test, contractor shall maintain the required moisture content of subgrade until concrete flatwork is placed.
- C. Other Fill and Backfill: Upper 12" of all other final subgrades or finish grades shall be compacted to 90% of maximum dry density.
- D. Gravel Fill: Do not place compacted gravel fill until after underground work and foundations are in place. Compact gravel fill with vibratory plate or similar equipment to preclude settlement.

3.11 PLACING, SPREADING, AND COMPACTION OF LANDSCAPE BACKFILL MATERIALS

- A. All landscaped areas shall receive topsoil. After subgrade under landscape area has been scarified and brought to 85% maximum dry density, top soil shall be placed evenly to depth of 12" at 85% of maximum dry density.
- B. Project Inspector must verify that materials are uniformly spread to minimum depth specified.

3.12 SLOPE CONSTRUCTION

- A. Cut slopes shall be constructed to no steeper than 2:1(horizontal:vertical). Fill slopes shall be constructed to no steeper than 2:1 (horizontal:vertical). Prior to placement of fill on an existing slope the existing slope shall be benched. The benches shall be in a ratio of 2 horizontal to 1 vertical. The face of the fill slopes shall be compacted as the fill is placed, or the slope may be overbuilt and then cut back to the design grade. Compaction by track walking will not be allowed.

3.13 FINISH GRADING

- A. At completion of project, site shall be finished graded, as indicated on Drawings. Finish grades shall be "flat graded" to grades shown on the drawing. Mounding of finish grades

**EARTHWORK
SECTION 31 0000
3595001**

will not be allowed unless otherwise directed on the landscape drawings. Tolerances for finish grades in drainage swales shall be $\pm 0.05'$. Tie in new and existing finish grades. Leave all landscaped areas in finish condition for lawn seeding. Landscaped planters shall be graded uniformly from edge of planter to inlets. If sod is used for turf areas the finish grade on which it is placed shall be lowered to allow for sod thickness.

- B. All landscape areas shall be left free of rock or foreign material.
- C. All landscape areas shall be approved by Architect prior to any planting.

3.14 SURPLUS MATERIAL

- A. Excavated material not required for grading or backfill shall be removed from site at contractor's expense.

3.15 CLEANING

- A. Refer to Section 01 7700.
- B. Remove from fill all vegetation, wood, form lumber, casual lumber, and shavings, in contact with ground; buried wood will not be permitted in any fill.

END OF SECTION

*s:\master specifications\division 31 - earthwork\31 0000_earthwork.docx
Received from WCEI: June 7, 2018, Updated format: 9-3-21*

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Trench backfill materials.

1.2 RELATED REQUIREMENTS

- A. Section 01 5000, Temporary Facilities and Controls.
- B. Section 01 8113, Sustainable Design Requirements, for CAL-Green **[and Collaborative for High Performance Schools (CHPS)]** general requirements and procedures.
- C. Section 31 0000, Earthwork.
- D. Section 32 8000, Irrigation.
- E. Section 33 0000, Utilities
- F. Section 33 4000, Storm Drainage Utilities.

1.3 REREENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CAL Green), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- C. California Plumbing Code (CPC), edition as noted on the drawings.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Submittal Procedures:
 - 1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
 - 2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
 - 3. Sustainable Design Submittals shall comply with the additional requirements of Section 01 8113, Sustainable Design Requirements.
- B. Coordination:
 - 1. General Contractor shall coordinate work as herein specified, in accordance with drawings and as required to complete scope of work with all related trades.

TRENCHING AND BACKFILLING
SECTION 31 2333
3595001

1.5 ACTION SUBMITTALS

- A. Provide supplier's descriptive literature for all products to demonstrate compliance with specified attributes:

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For contractor / Installer.

1.7 CLOSEOUT SUBMITTALS

- A. Guarantee: Submit subcontractor's guarantee.

1.8 QUALITY ASSURANCE

- A. Contractor / Installer shall have been in business for five (5) years providing/finishing similar size projects and complexity.
- B. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.
- C. All materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.

1.9 DELIVERY, STORAGE AND HANDLING

- A. Transport, store and handle in strict accord with the local jurisdiction.

1.10 FIELD CONDITIONS

- A. Contractor shall acquaint himself with all existing site conditions. If unknown active utilities are encountered during work, notify Architect promptly for instructions. Failure to notify will make Contractor liable for damage to these utilities arising from Contractor's operations subsequent to discovery of such unknown active utilities.
- B. Trench dewatering may be necessary. Contractor shall provide any and all tools, equipment and labor necessary for trench dewatering no matter what the source. Dewatering shall be continuous until all site utilities are installed and backfilled.

1.11 PROTECTION

- A. Adequate protection measures shall be provided to protect workers and passers-by on and off the site. Adjacent property shall be fully protected throughout the operations. Blasting will not be permitted. Prevent damage to adjoining improvements and properties both above and below grade. Restore such improvements to original condition should damage occur. Replace trees and shrubs outside building area disturbed by operations. Repair all trenches in grass areas with new sod (seeding not permitted) and "stake-off" for protection.

TRENCHING AND BACKFILLING
SECTION 31 2333
3595001

- B. Contractor shall be solely and completely responsible for working conditions at the job site, including safety of all persons and property during performance of the work. This requirement shall apply continuously and shall not be limited to normal working hours.
- C. Any construction review of the Contractor's performance conducted by the Architect or Owner is not intended to include review of the adequacy of the Contractor's safety measures, in, on or near the construction site.
- D. Provide shoring, sheeting, sheet piles and or bracing to prevent caving, erosion or gulying of sides of excavation.
- E. Surface Drainage: Provide for surface drainage during period of construction in manner to avoid creating nuisance to adjacent areas. Keep all excavations free from water during entire progress of work, regardless of cause, source or nature of water.
- F. Adjacent streets and sidewalks shall be kept free of mud, dirt or similar nuisances resulting from earthwork operations.
- G. The site and adjacent influenced areas shall be watered as required to suppress dust nuisance.
- H. Trees: Carefully protect existing trees which are to remain.

1.12 TRENCH SAFETY PROVISIONS

- A. General Contractor shall be solely responsible for safety design, construction and coordination with agencies having jurisdiction. If such plan varies from shoring system standards established by Construction Safety Orders, plan shall be prepared by registered civil or structural engineer.
- B. Nothing herein shall be deemed to allow use of shoring, sloping or protective system less effective than that required by Construction Safety Orders of California State Division of Industrial Safety.
- C. When trenching through paved surface, provide steel trench plates to cover open trenches daily until trenches are backfilled.

1.13 SEASONAL LIMITS

- A. No backfill material shall be placed, spread or rolled during unfavorable weather conditions. When work is interrupted by heavy rains, full operations shall not be resumed until field tests indicate that moisture content and density of fill are satisfactory.
- B. Material above optimum moisture shall be processed per Section 31 0000, Part 3, Article "Subgrade Preparation".

1.14 TESTING

- A. General: Refer to Section 31 0000, Part 1, Article "Testing" and Part 3, Article "Testing and Observation".

TRENCHING AND BACKFILLING
SECTION 31 2333
3595001

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Backfill materials: Pipeline and conduit trench backfill as shown on the plans and as specified below.
 - 1. $\frac{3}{4}$ inch crush rock.
 - 2. Native Materials: Soil native to Project Site, free of wood, organics, and other deleterious substances. Rocks shall not be greater than 3-inches.
 - 3. Sand: Fine granular material, free of organic matter, mica, loam or clay.
 - 4. Lean Mix Concrete: 3 sacks of cement per yard plus sand.
 - 5. Class 2 aggregate base, $\frac{3}{4}$ " rock, per Caltrans Section 26-1.02B
 - 6. Controlled Density Fill: 3 sack slurry backfill.
- B. Water: Furnish all required water for construction purposes, including compaction and dust control. Water shall be potable.
- C. Provide other bedding and backfill materials as described and specified in Section 33 0000, Section 33 4000 and Divisions 22 and 26.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verification of Conditions:
 - 1. Examine areas and conditions under which work is to be performed.
 - 2. Identify conditions detrimental to proper or timely completion of work and coordinate with General Contractor to rectify.

3.2 INSTALLATION

- A. Perform work in accordance with pipe manufacturer's recommendations, as herein specified and in accordance with drawings.

3.3 TRENCHING

- A. Make all trenches open vertical construction with sufficient width to provide free working space at both sides of trench around installed item as required for caulking, joining, backfilling and compacting; not less than 12 inches wider than pipe or conduit diameter, unless otherwise noted.
- B. Carefully excavate around existing utilities to avoid unnecessary damage. The contractor shall anticipate and perform hand work near existing utilities as shown on the survey, without additional claims or cost.
- C. Trench straight and true to line and grade with bottom smooth and free of edges or rock points.

TRENCHING AND BACKFILLING
SECTION 31 2333
3595001

- D. Where depths are not shown on the plans, trench to sufficient depth to give minimum fill above top of installed item measured from finish grade above the utility as follows:
1. Sewer pipe: depth to vary
 2. Storm drain pipe: depth to vary
 3. Water pipe - Fire Supply: 36 inches
 4. Water pipe – Domestic Supply: 30 inches

3.4 BACKFILL

- A. Pipe Trench Backfill is divided into three zones:
1. Bedding: Layer of material directly under the pipe upon which the pipe is laid.
 2. Pipe Zone: Backfill from the top of the bedding to 6 inches (compacted) over the top of the pipe.
 3. Upper Zone: Backfill between top of Pipe Zone and to surface of subgrade.
- B. Bedding: Type of material and degree of compaction for bedding backfill shall be as defined in the Details and Specifications.
- C. Pipe Zone and Upper Zone Backfill:
1. Type of material and degree of compaction Pipe Zone and Upper Zone Backfill shall be as required by Drawings, Details, & Specifications.
 2. Upper Zone Backfill shall not be placed until conformance of Bedding and Pipe Zone Backfill with specified compaction test requirements has been confirmed.
 3. Backfill shall be brought up at substantially the same rate on both sides of the pipe and care shall be taken so that the pipe is not floated or displaced. Material shall not be dropped directly on pipe.
- D. Backfill Compaction:
1. Backfill shall be placed in layers which, when compacted shall not exceed 6 inches in thickness. Each layer shall be spread evenly and thoroughly mixed to insure uniformity. Do not backfill over, wet, frozen or soft subgrade surfaces. Employ a placement method that does not disturb or damage foundation walls, perimeter drainage, foundation damp-proofing, waterproofing or protective cover.
 2. When moisture content of fill material is below that required to achieve specified density, add water until proper moisture content is achieved. When moisture content is above that required, aerate by blading or other methods until specified moisture content is met; see Section 31 0000, Part 3, Article "Subgrade Preparation".
 3. After each layer has been placed, mixed and spread evenly, it shall be thoroughly compacted to 95% of maximum dry density while at specified moisture content. Compact each layer over its entire area until desired density has been obtained.
 4. Compaction: All backfill operations shall be observed by the Inspector of Record and/or Geotechnical Engineer. Field density tests shall be made to check compaction of fill material. If densities are not satisfactory, Contractor will be

TRENCHING AND BACKFILLING
SECTION 31 2333
3595001

required to change equipment or procedure or both, as required to obtain specified densities. Notify Inspector and Architect at least 24 hours in advance of any operation.

E. Backfill in Areas Previously Lime or Cement Treated

1. Where trenching occurs in areas that have been lime or cement treated, class 2 aggregate bases or approved controlled density backfill material shall be used for the top 12-inches minimum of the trench or thickness shall match the depth of treated material.

3.5 TRENCH AND SITE RESTORATION

- A. Finished surface of trenches shall be restored to a condition equal to, or better than the condition as existed prior to excavation work.

3.6 PROTECTION

- A. Protect existing surfaces, structures, and utilities from damage. Protect work by others from damage. In the event of damage, immediately repair or replace to satisfaction of Owner.
- B. Repair existing landscaped areas to as new condition. Replant trees, shrubs or groundcover with existing materials if not damaged or with new materials if required. Replace damaged lawn areas with sod, no seeding will be permitted.
- C. Replace damaged pavement with new compatible matching materials. Concrete walks to be removed to nearest expansion joint and entire panel replaced. Asphalt to be cut neatly and replaced with new materials.
- D. Any existing materials removed or damaged due to trenching to be returned to new condition.

3.7 SURPLUS MATERIAL

- A. Remove excess excavated material, unused materials, damaged or unsuitable materials from site.

3.8 CLEANING

- A. Refer to Section 01 7700.
- B. Contractor will keep the work areas in a clean and safe condition so his rubbish, waste, and debris do not interfere with the work of others throughout the project and at the completion of work.
- C. After completion of work in this section, remove all equipment, materials, and debris. Leave entire area in a neat, clean, acceptable condition.

TRENCHING AND BACKFILLING
SECTION 31 2333
3595001

END OF SECTION

s:\master specifications\division 31 - earthwork\31 2333_trenching and backfilling.docx
Received from WCEI: October 20, 2012; Updated 9-2-21

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Aggregate.
 - 2. Asphalt paving.
 - 3. Seal coat.
 - 4. Wood headers and stakes.
 - 5. Pavement marking.
 - 6. Precast concrete bumpers.

1.2 RELATED REQUIREMENTS

- A. Section 01 5000, Temporary Facilities and Controls.
- B. Section 01 6116, Volatile Organic Compound (VOC) Restrictions, for VOC limits pertaining to adhesives, sealants, fillers, primers, and coatings.
- C. Section 01 8113, Sustainable Design Requirements, for CAL-Green **[and Collaborative for High Performance Schools (CHPS)]** general requirements and procedures.
- D. Section 31 0000, Earthwork.
- E. Section 31 2333, Trenching and Backfilling.
- F. Section 32 8000, Irrigation.
- G. Section 33 0000, Utilities.
- H. Section 33 4000, Storm Drainage Utilities.

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CAL Green), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- C. Local Jurisdiction: Any work within the street, highway or right-of-way shall be performed in accordance with the requirement of the governmental agencies having jurisdiction, and shall not begin until all of those governing authorities have been notified.
- D. ASTM International (ASTM):

**ASPHALT CONCRETE PAVING
SECTION 32 1200
3595001**

1. D698-00 Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures, Using 5.5 lb (2.49 Kg) Rammer and 12 inch (304.8 mm) Drop.
2. D1556-00 Test Method for Density of Soil in Place by the Sand-Cone Method.
3. D1557-02 Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 10 lb. (4.54 Kg) Rammer and 18 inch (457 mm) Drop.
4. D6628-16 Standard Specification for Color of Pavement Marking Materials.
5. D3017-05 Test Methods for Moisture Content of Soils and Soil-Aggregate Mixture by Nuclear Methods (Shallow Depth).
6. D4318-05 Test Method for Liquid Limit, Plastic Limit, and Plasticity Limit.

E. CALTRANS Standard Specifications.

F. CAL-OSHA, Title 8, Section 1590 (e).

1.4 ADMINISTRATION REQUIREMENTS

A. Submittal Procedures:

1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
3. Sustainable Design Submittals shall comply with the additional requirements of Section 01 8113, Sustainable Design Requirements.

1.5 ACTION SUBMITTAS

A. Provide supplier's descriptive literature for all products to demonstrate compliance with specified attributes.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Contractor / Installer.

B. Sustainable Design:

1. General
 - a. Submit information necessary to establish and document compliance with the California Green Building Standards Code.
 - b. Sustainable design submittals are in addition to other submittals.
2. The following information shall be provided:
 - a. Adhesives and Sealants: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.
 - b. Paints and Coatings: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.

1.7 CLOSEOUT SUBMITTALS

- A. Guarantee: Submit subcontractor's guarantee.

1.8 QUALITY ASSURANCE

- A. Contractor / Installer shall have been in business for five (5) years providing/finishing similar size projects and complexity.
- B. Contractor shall be solely responsible for all subgrades built. Any repairs resulting from inadequate compaction is the responsibility of the contractor.
- C. The representatives of the Owner's testing lab will not act as supervisor of construction, nor will they direct construction operations. Neither the presence of the Owner's testing lab representatives nor the testing by the Owner's testing lab shall excuse the contractors or subcontractors for defects discovered in their work during or following completion of the project. Correcting inadequate compaction is the sole responsibility of the contractor.
- D. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.
- E. All materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.
- F. Contractor shall provide verification that asphalt mix temperature meets the requirements of this specification at time of application.
- G. Tests (See Part 1, Article "Testing").

1.9 DELIVERY, STORAGE AND HANDLING

- A. Transport, store and handle in strict accord with the local jurisdiction.

1.10 FIELD CONDITIONS

- A. Environmental Requirements:
 - 1. Base Course: Do not lay base course on muddy subgrade, during wet weather, or when atmospheric temperature is below 40 degrees F.
 - 2. Asphalt Surfacing: Do not apply asphaltic surfacing on wet base, during wet weather, or when atmospheric temperature is below 50 degrees F.

1.11 EXISTING SITE CONDITIONS

- A. Contractor shall acquaint himself with all site conditions. If unknown active utilities are encountered during work, notify Architect promptly for instructions. Failure to notify will make Contractor liable for damage to these utilities arising from Contractor's operations subsequent to discovery of such unknown active utilities.

1.12 PROTECTION

- A. Adequate protection measures shall be provided to protect workmen and passers-by on and off the site. Adjacent property shall be fully protected throughout the operations. Blasting will not be permitted. Prevent damage to adjoining improvements and properties both above and below grade. Restore such improvements to original condition should damage occur. Replace trees and shrubs outside building area disturbed by operations.
- B. In accordance with generally accepted construction practices, the Contractor shall be solely and completely responsible for working conditions at the job site, including safety of all persons and property during performance of the work. This requirement shall apply continuously and shall not be limited to normal working hours.
- C. Any construction review of the Contractor's performance conducted by the owner's representative is not intended to include review of the adequacy of the Contractor's safety measures, in, on, or near the construction site.
- D. Surface Drainage: Provide for surface drainage during period of construction in manner to avoid creating nuisance to adjacent areas. The contractor shall make a reasonable effort on a daily basis to keep all excavations and the site free from water during entire progress of work, regardless of cause, source, or nature of water.
- E. Adjacent streets and sidewalks shall be kept free of mud, dirt or similar nuisances resulting from earthwork operations.
- F. The site and adjacent influenced areas shall be watered as required to suppress dust nuisance. Dust control measures shall be in accordance with the local jurisdiction.

1.13 SEASONAL LIMITS

- A. No fill material shall be placed, spread or rolled during unfavorable weather conditions. When work is interrupted by rains, fill operations shall not be resumed until field tests indicate that moisture content and density of fill are satisfactory.

1.14 TESTING

- A. General: Refer to Section 01 4523 – TESTING & INSPECTION SERVICES AND STRUCTURAL TESTS AND INSPECTIONS LIST, DSA-103.
- B. Geotechnical Engineer: Owner is retaining a Geotechnical Engineer to determine compliance of fill with Specifications, and to direct adjustments in fill operations. Costs of Geotechnical Engineer will be borne by Owner; except those costs incurred for re-tests or re-inspection will be paid by Owner and backcharged to Contractor.

PART 2 - PRODUCTS

2.1 DESIGN AND PERFORMANCE CRITERIA

- A. Sustainable Design:

**ASPHALT CONCRETE PAVING
SECTION 32 1200
3595001**

1. VOC emissions for field-applied adhesives, sealants, and sealant primers must comply with limits specified in Section 01 6116.
2. VOC emissions for field-applied paints and coatings must comply with limits specified in Section 01 6116.

2.2 MATERIALS

- A. Sterilant: Soil sterilizer shall be CIBA GEIGY's Pramitol 25-E, Treflan EC or Thompson-Hayward Casoron.
 1. Soil sterilizer shall be applied in strict accordance with manufacturer's instructions.
- B. Base Course Aggregate: State Specifications, Section 26, Class 2 aggregate base (3/4" max.).
- C. Asphalt Binder: Steam-refined paving asphalt conforming to State Specifications, Section 92, viscosity grade PG 64-10. Asphalt binder additives for HMA per Caltrans approved list of manufacturers.
- D. Liquid Asphalt Tack Coat: Per CALTRANS section 94.
- E. Surface Course Aggregate: Mineral aggregates for Type "B" asphalt concrete, conforming to State Specifications 39-2.02, Type B, 1/2" maximum, medium gradient. 3/8" maximum gradient at Playcourt.
- F. Seal Coat: shall be a pre-mixed asphalt emulsion blended with select fillers and fibers such as:
 1. "Park-Top No. 302", Western Colloid Products.
 2. "Overcoat", Reed and Gram.
 3. "Drivewalk", Conoco Oil.
- G. Wood Headers and Stakes: Pressure treated.
- H. Pavement Marking: Colors as directed by Architect. Colors of painted traffic stripes and pavement markings must comply with ASTM D6628.
 1. Waterborne traffic line - colors white, yellow and red, State specification PTWB-01R3.
 2. Waterborne traffic line for the international symbol of accessibility and other curb markings – blue, red and green, Federal specification TT-P-1952F.
- I. Precast Concrete Bumpers: 3000 psi at 28 day minimum strength; 48" length unless otherwise indicated; provide with steel dowel anchors and concrete epoxy.
- J. Pavement Epoxy; K-Lite; KtepX-590; Ennis Epoxy HPS2 or an approved equal.
- K. Crack Filler; QPR model CAR08, 10oz asphalt crack filler; Star STA-FLEX Trowel Grade crack filler or approved equal.

**ASPHALT CONCRETE PAVING
SECTION 32 1200
3595001**

- L. Reclaimed Asphalt Paugment (RAP). HMA Type A or Type B may be produced using RAP providing it does not exceed 15% or the aggregate blend.

2.3 MIXES

- A. General: Plant mixed conforming to State Specifications, Section 39, Type B, 1/2" maximum, medium grading. 3/8" maximum grading shall be used at hardcourt.
- B. Temperature of Hot Mix Asphalt: Not less than 275 degrees F nor more than 325 degrees F when added to aggregate.
- C. Temperature of Hot Mix Aggregate: Not less than 250 degrees F nor more than 325 degrees F when asphalt is added.
- D. Temperature of Hot Mix Asphalt Concrete: Asphalt shall be not less than 285 degrees at time of application, nor more than 350 degrees. Asphalt not meeting the required temperature shall not be used.
- E. Temperature of Warm Mix Asphalt: Mixing and placement; per the approved manufactures heat range recommendations for mixing and placement.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Conditions of Work in Place: Subsurfaces which are to receive materials specified under this Section shall be carefully examined before beginning work hereunder, and any defects therein shall be reported, in writing, to the Architect. Work shall not be started until such defects have been corrected. Starting of work shall imply acceptance of conditions as they exist.

3.2 PREPARATION

- A. Sub-Grade: Clean, shape and compact to hard surface free from elevations or depressions exceeding 0.05' in 10' from true plan. Compact per Section 31 0000. Compaction and moisture content shall be verified immediately prior to placement of aggregate base. Proof roll subbase in presence of geotechnical engineer prior to placement of aggregate base.

3.3 INSTALLATION

- A. Headers:
 - 1. General: Install as edging to asphalt paving, except where adjoining existing pavement, concrete curbs, walks or building.
 - 2. Existing Headers: Remove existing headers where new paving will join existing. Saw cut existing asphalt to provide clean edge.
 - 3. Lines and Levels: Install true to line and grade. Cut off tops of stakes 2-inches below top of header so they will not be visible on completion of job.

**ASPHALT CONCRETE PAVING
SECTION 32 1200
3595001**

B. Asphalt Paving:

1. Base Course: Install in accord with State Specifications, Section 26. Compact to relative compaction of not less than 95%, ASTM D1557. The material shall be deposited on the subgrade in such a manner as to provide a uniform section of material within five percent tolerance of the predetermined required depth. Deposition will be by spreader box or bottom dump truck to prevent segregation of the material. The material so deposited on the subgrade shall have sufficient moisture which, in the opinion of the Architect is adequate to prevent excessive segregation. It shall then be immediately spread to its planned grade and cross section. Undue segregation of material, excessive drifting or spotting of material will not be permitted. If in the opinion of the site geotechnical engineer, the material is unsuitably segregated, it shall be removed or completely reworked to provide the desired uniformity of the material.
 - a. Moisture content and compaction of base material shall be tested immediately prior to placement of asphalt paving.
2. Sterilant: Apply specified material at manufacturer's recommended rate. Applicator of sterilant material shall be responsible for determining location of all planter areas. Apply specified material over entire base course area just prior to application of asphalt. Follow manufacturer's printed directions.
3. Liquid Asphalt Tack Coat: Apply as "tack coat" to all vertical surfaces of existing paving, curbs, walks, and construction joints in surfacing against which paving is to be placed.
4. Asphalt Concrete Surface Course:
 - a. Comply with State Specifications, 39-6 except as modified below.
 - 1) Final gradation shall be smooth, uniform and free of ruts, humps, depressions or irregularities, with a minimum density of 91% of the theoretical maximum specific gravity determined by California Test Method #309. Maximum variation 1/8 inch in 10' when measured with steel straightedge in any one direction. Test paved areas for proper drainage by applying water to cover area. Correct portions that do not drain properly by patching with plant mix. In no case shall accessible parking spaces or loading and unloading areas exceed 2% slope in any direction.
 - 2) Asphalt material shall be delivered to the project site in a covered condition to maintain acceptable temperature.
5. Placement and adjustment of Frames, Covers, Boxes and Grates: The Contractor shall set and adjust to finish grade all proposed and existing frames, covers, boxes, and grates of all manholes, drop inlets, drain boxes, valves, cleanouts, electrical boxes and other appurtenant structures prior to placement of asphaltic concrete.
6. Water Testing: All paved areas shall be water tested, to check drainage, in the presence of the project inspector prior to placement of seal coat. The surface of asphalt paving shall not vary more than 1/8 inch above or below the grade established on the plans. If variations in grade are present, they will be corrected by overlaying paving and/or pavement removal and replacement as directed by the Architect.

**ASPHALT CONCRETE PAVING
SECTION 32 1200
3595001**

7. Patching: Cut existing paving square and plumb at all edges to be joined by new paving. In trenches; grind existing asphalt on each side of trench 3" wide x 1/2 the depth of the section. Apply tack coat to vertical surfaces before installing new work. Warp carefully to flush surface, with seal over joints, and feather edge. Sawcut, remove and patch existing paving where cutting is necessary for installation of piping or conduits under Divisions 15, 16 and 33.
8. Seal Coat:
 - a. Seal coat shall be applied no sooner than 30 days from time of asphalt placement.
 - b. Surface Preparation: surface shall be clean of all dirt, sand, oil or grease. Hose down entire area with a strong jet of water to remove all debris. Remove soft, loose, or otherwise damaged areas of asphalt concrete to full depth of damage and replace with compacted asphalt concrete as specified herein. Minor holes and imperfections may be patched using hot mix asphalt or mastic using sand/SS-1-H. Use wire brush for removal of oil and grease; prime with shellac or synthetic resin as recommended by manufacturer of pavement sealer material.
 - c. Seal Coat Seal Application: Thoroughly mix materials in the presence of the onsite inspector. Failure to do so will be cause for rejection. Apply in accordance with manufacturer's written instructions.
 - a. The minimum application rate for each applied coat shall be 30gals per 1000 sq. ft. Two coats of sealcoat will be required.
 - b. Clean-Up and Precautions: As recommended by pavement sealer material manufacturer.
 - d. Clean-Up and Precautions: As recommended by pavement sealer material manufacturer.
- C. Pavement Marking: painted pavement markings shall be done only after the seal coat has thoroughly dried. On clean surfaces to be painted with traffic paint of dust, dirt, grime, oil, rust or other contaminants which will impair the quality of work or interfere with proper bond of paint coats. Surfaces shall be cleaned to the extent and by whatever means that will satisfactorily accomplish the purpose without damage to asphalt concrete. Provide measured layouts, temporary markings, templates, and other means necessary to provide required marking. Prepare and apply paint in accordance with manufacturer's instructions; paint shall be applied by spray and shall achieve complete coverage free from voids and thin spots. Where indicated on the Drawings, paint parking stall strips, lettering, arrows, accessible symbols, playground markings, game striping, maps, etc. on concrete paving or asphalt concrete paving. Paint stripes shall be 4 inches wide (except otherwise indicated) and applied with two (2) coats of herein specified Traffic Line Paint; white (except as otherwise specified or indicated).
 1. International Accessible Symbol: Symbol shall be white figures on a blue background. Blue shall be equal to color No. 15090 in Fed. Std. 595c. Lines and symbols shall be accurately formed and true to line and form; lines shall be straight and uniform in width. Painted edges shall be clean cut and free from raggedness, and corners shall be cut sharp and square. Tolerances: Apply striping within a tolerance 1/2 inch in 50 feet. Apply markings and striping to widths indicated with a tolerance of 1/4 inch on straight sections and 1/2 inch on curved sections.

ASPHALT CONCRETE PAVING
SECTION 32 1200
3595001

- D. Colors: As directed by Architect
- E. Precast Concrete Bumpers: Install where shown, using steel dowels, and epoxy applied for length to wheel stop without damage to bumpers or asphalt concrete paving.

3.4 CLEANING

- A. Upon completion of work of this Section promptly remove from the working area all scraps, debris and surplus material of this Section.
- B. Clean excess material from surface of all concrete walks and utility structures.

END OF SECTION

*s:\master specifications\division 32 - site improvements\32 1200_asphalt concrete paving.docx
Received from WCEI: December 18, 2020, Format Updated 9-8-21*

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Concrete curbs and gutters.
2. Concrete pavement, sidewalks and ramps.
3. Steel reinforcing for flatwork and curbs.
4. Truncated domes.

1.2 RELATED REQUIREMENTS

- A. Section 01 6116, Volatile Organic Compound (VOC) Restrictions; for VOC limits pertaining to adhesives, sealants, fillers, primers, and coatings.
- B. Section 01 8113, Sustainable Design Requirements, for CAL-Green **[and Collaborative for High Performance Schools (CHPS)]** general requirements and procedures.
- C. Division 31, Earthwork.
- D. Section 32 1200, Asphalt Concrete Paving.

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CALGreen), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- C. American Concrete Institute (ACI):
1. 117: Specification for Tolerances for Concrete Construction and Materials and Commentary.
 2. 211.1: Standard Practice for Selecting Proportions for Normal, Heavyweight and Mass Concrete.
 3. 301: Specifications for Structural Concrete.
 4. 302.1R: Guide to Concrete Floor and Slab Construction.
 5. 305R: Guide to Hot Weather Concreting.
 6. 306R: Guide to Cold Weather Concreting.
 7. 308R: Guide to External Curing of Concrete.
 8. 318: Building Code Requirements for Structural Concrete and Commentary.
 9. 347R: Guide to Formwork for Concrete.
- D. ASTM International (ASTM):

1. A615/A615M: Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement.
 2. A706/A706M: Standard Specification for Deformed and Plain Low-Alloy Steel Bars for Concrete Reinforcement.
 3. C33/C33M: Standard Specification for Concrete Aggregates.
 4. C94/C94M: Standard Specification for Ready-Mixed Concrete.
 5. C143/C143M: Standard Test Method for Slump of Hydraulic-Cement Concrete.
 6. C150/C150M: Standard Specification for Portland Cement.
 7. C260/C260M: Standard Specification for Air-Entraining Admixtures for Concrete.
 8. C309: Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete.
 9. C330/C330M: Standard Specification for Lightweight Aggregates for Structural Concrete.
 10. C494/C494M: Standard Specification for Chemical Admixtures for Concrete.
 11. C618: Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete.
 12. C920: Standard Specification for Elastomeric Joint Sealants.
 13. C1107/C1107M: Standard Specification for Packaged Dry, Hydraulic Cement Grout (Non-Shrink).
 14. C1315: Standard Specification for Liquid Membrane-Forming Compounds Having Special Properties for Curing and Sealing Concrete.
 15. D1751: Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types).
 16. D5893/D5893M: Standard Specification for Cold Applied, Single Component, Chemically Curing Silicone Joint Sealant for Portland Cement Concrete Pavements.
- E. Concrete Reinforcing Steel Institute (CRSI):
1. Manual of Standard Practice.
 2. Placing Reinforcing Bars.
- F. State of California, Department of Transportation (Caltrans):
1. Division of Engineering Services:
 - a. California Test 342: Method of Test for Surface Skid Resistance with the California Portable Skid Test.
 2. Standard Specifications.
 - a. Section 51, Concrete Structures.
 - b. Section 52, Reinforcement.
 - c. Section 73, Concrete Curbs and Sidewalks.
 - d. Section 90, Concrete.
- G. US Government General Services Administration (GSA/SAE):

1. GSA/SAE AMS-STD-595A: Colors Used In Government Procurement.

1.4 ADMINISTRATIVE REQUIREMENTS

A. Submittal Procedures:

1. Action Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
3. Sustainable Design Submittals shall comply with the additional requirements of Section 01 8113, Sustainable Design Requirements.

1.5 ACTION SUBMITTALS

A. Shop Drawings: Joint pattern layout for walks and pavement.

B. Product Data:

1. A complete list of materials proposed to be used for the site concrete work including, but not limited to, sand, gravel, admixtures, surface treatments, coloring agents, sealers, cast-in-place accessories, forming and curing products, concrete mix designs, reinforcing materials, joint materials, curing materials, and detectable warning surface.
2. Manufacturer's descriptive literature for products proposed for use. Include installation instructions, and maintenance instructions.

C. Concrete Mix Design: The Contractor shall submit three copies of each proposed mix design for each class of concrete in accordance with ACI 301, Sections 3.9 "Proportioning on the Basis of Previous Field Experience or Trial Mixture," or 3.10 "Proportioning Based on Empirical Data." The Contractor shall submit a separate mix design for concrete to be placed by pumping, in addition to the mix design for concrete to be placed directly from the truck chute.

1. The following information shall be included in the concrete mix design:
 - a. Proportions of cement, fine and coarse aggregate, and water.
 - b. Water-cement ratio, 28-day compressive design strength, slump, and air content.
 - c. Type of cement and aggregate.
 - d. Special requirements for pumping.
 - e. Range of ambient temperature and humidity for which design is valid.
 - f. Special characteristics of mix, which require precautions in mixing, placing, or finishing techniques to achieve specified finished product.
2. Do not begin concrete production until mixes have been reviewed and approved by Engineer.
 - a. Review of mix design by the Architect and Engineer shall in no way relieve the subcontractor of his responsibility for the performance of the concrete.

D. Qualification Data: For manufacturer

- E. Delivery tickets as specified for ready-mixed concrete.
- F. Sustainable Design:
 - 1. General:
 - a. Submit information necessary to establish and document compliance with the California Green Building Standards Code.
 - b. Sustainable design submittals are in addition to other submittals.
 - 2. The following information shall be provided:
 - a. Adhesives and Sealants: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.
 - b. Paints and Coatings: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.

1.6 CLOSEOUT SUBMITTALS

- A. Guarantee: Submit subcontractor's guarantee.

1.7 QUALITY ASSURANCE

- A. Qualifications:
 - 1. Manufacturer of ready-mixed concrete products shall meet ASTM C94/C94M requirements for production facilities and equipment.
- B. Design, erect, support, brace and maintain formwork and shoring to safely support all loads that might be applied until such loads can be carried by concrete.
- C. The Contractor shall perform work in accordance with ACI 301.
- D. Use only new materials and products.
- E. Single-Source Responsibility: Use materials and products of one manufacturer whenever possible.
- F. Materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.
- G. Testing to determine compliance with the work of this Section will be the responsibility of the Contractor.
 - 1. Cement and reinforcing shall be tested in accordance with CBC Section 1910A. Testing of reinforcing may be waived in accordance with Section 1910A.2 when approved by the Engineer and DSA.
 - 2. Testing will be performed by an independent testing and inspecting agency in accordance with Section 01 4523, Testing and Inspection Services, and paid for by the Owner.
 - 3. Refer to Article FIELD QUALITY CONTROL in Part 3 of this Section for additional requirements.

4. Cost of retests and coring due to low strength or defective concrete will be paid by the Owner and back-charged to the Contractor.
- H. Sieve analysis from testing laboratories identifying rock/sand percentages within the concrete mix; or class 2 aggregate base shall have the current Project name and Project location identified on the report. Outdated analytical reports greater than 90 days old will not be accepted.
- I. Mockups: Provide on-site mockup panels for each type of exposed colored concrete flatwork showing texture and color before proceeding with finish to be used on this Project.
 1. Construct sample panels after review and approval of samples.
 2. Size: Minimum 5 feet square and have at least one longitudinal and one transverse joint unless a more specific note indicates otherwise on Drawings.
 3. Construct sample panels at location approved by Architect.
 4. Construct sample panels in ample time to allow for finishing and curing before requesting Architect to review.
 5. Follow procedures used on accepted samples.
 6. Include saw-cut and tooled joints to match method and appearance proposed for use in completed work.
 7. Prepare successive sample panels as required until finish, color, and appearance is approved by Architect.
 8. Do not remove sample panels until authorized in writing by the Architect and all concrete work has been approved.

1.8 DELIVERY, STORAGE AND HANDLING

- A. Deliver undamaged products to job in manufacturer's sealed containers and/or original bundles with tags and labels intact.
- B. Store materials in protected, dry conditions off of ground and in areas so as to not interfere with the progress of the Work.
- C. Transport, store and handle in strict accordance with the manufacturer's written recommendations.
- D. Store cement in weather tight building, permitting easy inspection and identification. Protect from dampness. Lumpy or stale cement will be rejected.
- E. Aggregates: Prevent excessive segregation, or contamination with other materials or other sizes of aggregate. Use only one supply source for each aggregate stock pile.

1.9 FIELD CONDITIONS

- A. Make and be responsible for all field dimensions necessary for proper fitting, slopes, and completion of work. Report discrepancies to Architect before proceeding.
- B. Do not place concrete during rain without adequate protection.

- C. The Contractor shall conform to ACI 306R when mixing and placing concrete during cold weather. Provide sufficient protection when daily temperatures drop below 40 degrees F.
- D. The Contractor shall conform to ACI 305R when mixing and placing concrete during hot weather. When air temperature exceeds 100 degrees F adjust concrete mix with retarding admixture in design mix, and adequately test and take additional measures as directed by concrete supplier.
- E. The Contractor shall maintain access for vehicular and pedestrian traffic as required for other construction activities. Use temporary striping, flagmen, barricades, warning signs, and warning lights as required.
- F. Placing in hot weather: Comply with ACI 305R. Concrete shall be delivered, placed and finished in a sufficiently short period of time to avoid surface dry checking.
 - 1. Concrete shall not exceed 85 degrees F at time of placement.
 - 2. Concrete shall be kept wet continuously after tempering until implementation of curing compound procedure in accordance with this specification.
 - 3. Evaporation Retarder: Apply evaporation retarder to concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 pounds per square foot per hour, before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.
- G. Placing in Cold Weather: Comply with ACI 306R. Protect from frost or freezing. No antifreeze admixtures are permitted.
 - 1. When placing concrete during freezing or near-freezing weather, mix shall have temperature of at least 50 degrees F but not more than 90 degrees F.
 - 2. Concrete shall be maintained at temperature of at least 50 degrees F for not less than 72 hours after placing or until it has thoroughly hardened.
 - 3. Provide necessary thermal coverings for any flat work exposed to freezing temperatures.

PART 2 - PRODUCTS

2.1 DESIGN AND PERFORMANCE CRITERIA

- A. Contractor shall comply with requirements applicable to this Section for concrete materials, admixtures, bonding materials, curing materials, surface sealers and others as required.
- B. Concrete walking surfaces shall have a coefficient of friction not less than 0.30 and will be subject to testing to verify compliance as specified in Article FIELD QUALITY CONTROL.
 - 1. The coefficient of friction will be measured by California Test 342 before pavement is opened to public traffic, but not sooner than 7 days after concrete placement.

2. Contractor shall notify the Architect and Project Inspector of pavement having a coefficient of friction less than 0.30.
- C. Sustainable Design:
1. VOC emissions for field-applied adhesives, sealants, and sealant primers must comply with limits specified in Section 01 6116.
 2. VOC emissions for field-applied paints and coatings must comply with limits specified in Section 01 6116.

2.2 FORMING MATERIALS

- A. Form Material: Steel, wood, or other suitable material of size and strength to resist movement during concrete placement and to retain horizontal and vertical alignment until removal. Use straight forms, free of distortion and defects. Use flexible spring steel forms or laminated boards to form radius bends as required. The forms shall be of a depth equal to the depth of curbing or sidewalk, and so designed as to permit secure fastening together at the tops. Coat forms with non-staining type coating that will not discolor or deface surface of concrete.
1. Concrete Exposed to View: 5/8-inch minimum APA B-B Plyform, steel or "Sonotube" forms by Sunoco, 888-875-8754, or equal.
 2. Concrete Concealed from View: 5/8-inch minimum APA B-B Plyform, steel or 1 x 8 DF, Number 2 Grade or better.
- B. Form Ties: Snap off metal of fixed length, leaving no metal within 1-1/2 inches of surface and no fractures, spalls or other surface defects larger than 1 inch diameter; manufactured by Burke, Dayton Superior, or equal.
- C. Spreaders: Metal. Wood is not permitted.
- D. Form Coating: Coat forms with non-staining material that will not discolor or deface surface of concrete or leave any residue on concrete that would interfere with surface coating as approved by the Architect.
- E. Chamfer Strips: Rigid polyvinyl chloride, 3/4-inch x 3/4-inch, in maximum possible lengths, manufactured by Burke, Greenstreak, Vulco, or equal.

2.3 REINFORCING MATERIALS

- A. Reinforcement Bars: New billet steel deformed bars conforming to requirements of ASTM A615/A615M or ASTM A706/A706M; Grade 60.
1. Bars for dowels installed through expansion joints or construction joints to existing sidewalks or concrete features shall be smooth or if deformed shall be sleeved on one end for slippage.
- B. Reinforcing Supports: Galvanized metal chairs or spacers or metal hangers, accurately placed 3 feet on center each way, staggered, with each support securely fastened to steel reinforcement in place.

1. Bottom bars in footings may be supported with 3-inch concrete blocks with embedded wire ties.
2. Concrete supports without wire ties will not be allowed.

2.4 CONCRETE MATERIALS

- A. Cement: Portland cement in accordance with ASTM C150/C150M, Type II, low alkali.
- B. Concrete Aggregates: Graded from coarse to fine in accordance with ASTM C33/C33M.
 1. Normal Weight Aggregates: Clean and free from deleterious coatings, clay balls, roots, and other extraneous materials, and in conformance with ASTM C33/C33M, except as otherwise specified. Combined grading shall meet limits of ASTM C33/C33M.
 - a. Size: Not be larger than one-fifth of the narrowest dimension between forms, or larger than three-fourths of the minimum clear spacing between reinforcing bars.
 2. Lightweight Aggregates:
 - a. General: Durable particles suitably processed, washed and screened without adherent coatings, free of materials with deleterious reactivity to alkali in cement, and conforming to ASTM C330/C330M.
 - b. Fine aggregate shall be natural sand, or sand prepared from stone or gravel, with grains free of silt, loam and clay.
- C. Water: Potable, clean, and in accordance with ASTM C94/C94M, free from injurious amounts of oil, acids, alkalis, salts, scale, organic materials or other deleterious matter, and in compliance with ACI 318 Section 26.4.1.3.
- D. Fly Ash: Western Fly Ash, conforming to ASTM C618 for Class N or Class F materials and in accordance with CBC Section 1903A.6.
 1. Class C is not permitted.
 2. Proportions: Not more than 15 percent (by weight) may be substituted for portland cement.

2.5 ADMIXTURES

- A. Water Reducing Admixture: Admixture to improve placing, reduce water cement ratio and ultimate shrinkage; "WRDA 64" by GCP Applied Technologies, or equal conforming to ASTM C494/C494M and ACI 318 Section 3.6.
 1. Water reducing admixture may be used subject to prior approval by the Architect, Engineer, and the Testing Lab.
 2. Proposed product and quantity shall be included in original design mix.
- B. Air-Entraining Admixture: "Daravair 1000" by GCP Applied Technologies or equal conforming to ASTM C260 and ACI 318, section 26.4.1.4.
 1. Proportion air entraining concrete to attain specified minimum 28-day compressive strength.

2. Total air entrainment in concrete shall be not less than 4 percent or more than 6 percent of the volume of concrete.
- C. Glare Reduction Colorant: Concentrated pigment dispersions designed to permanently color concrete; "Chromix L10 Base-Black" by Sika Corporation, or equal. *Was within 2.2 H.1*

2.6 CURING MATERIALS

- A. Clear Curing Compound: Water-based membrane-forming concrete curing compound in accordance with ASTM C309 and C1315; "Aqua Resin Cure Clear" by Burke CO, "1100" by W.R. Meadows, or equal.

2.7 ADDITIONAL MATERIALS AND COMPONENTS

- A. Concrete Bonding Agent: The following, or equal, conforming to ASTM C1059/C1059M.
 1. "Weld-Crete" by Larson Products Corporation, 800-633-6668.
 2. "Daraweld C" by GCP Applied Technologies, 877-423-6491.
- B. Patching Mortar: One-component, trowel applied, migrating-corrosion-inhibitor enhanced, polymer-modified, shrinkage-compensated, fiber reinforced, micro-silica enhanced, cementitious repair mortar for horizontal, vertical, and overhead applications; "Meadow-Crete GPS" by W.R. Meadows, or equal.
- C. Non-Shrink Grout: Premixed, non-metallic, no chlorides, non-staining and non-shrinking conforming to ASTM C1107/C1107M; "MasterFlow 713" by Master Builders Solutions, a division of BASF, 800-433-9517, or equal.
- D. Drainage Rock Base: 3/4-inch aggregate size conforming to Class 2 Aggregate Base as defined in Caltrans Standard Specifications Section 26, or equal clean free-draining gravel or crushed rock as recommended by the Geotechnical Engineer.
- E. Expansion Joint Material: Preformed 3/8-inch fiber material, with bituminous binder manufactured for use as concrete expansion joint material and conforming to ASTM D1751 and approved by Architect.
 1. Furnish joint fillers in one-piece lengths for full width being placed, wherever possible. Where more than one length is required, lace or clip joint-filler sections together.
- F. Joint Sealant for Expansion Joints in Concrete: Weather and UV resistant, single component, cold applied silicone sealant, Type S, conforming to ASTM D5893/D5893M; ASTM C920, Grade P, Class 25, Use T.
 1. Self-Leveling: "DOWSIL 890-SL Silicone Joint Sealant" by Dow Chemical Company, or equal.
 2. At Slopes Exceeding 5 Percent: Non-sagging; "DOWSIL 888 Silicone Joint Sealant" by Dow Chemical Company, or equal.
 3. Color: As standard with manufacturer.

- G. Pre-Formed Plastic Expansion Joint Caps: Polystyrene, with removable tops; "Snap Cap" by W. R. Meadows, Tex-Trude expansion caps, or equal.
- H. Truncated Domes: Vitrified Polymer Composite (VPC) cast-in-place detectable/tactile warning surface tiles complying with Americans with Disabilities Act (ADA) and the California Code of Regulations (CCR) Title 24, Part 2, Chapter 11B; "Armor-Tile", "Access Tile Tactile Systems," or equal.
 - 1. Color: Shall be yellow and approximate 33538 of GSA/SAE AMS-STD-595A in accordance with CBC Section 11B-705.1.1.3.1.
- I. Traffic Paint for Accessibility Striping at Stairs: VOC compliant, water-based, vinyl acrylic copolymer fast drying emulsion and specifically formulated as a traffic marking paint; "Setfast" with "Duckback" abrasive additive by Sherwin-Williams, "SAFE-STRIDE" by Wooster Products, Inc., or equal.
 - 1. Colors: As selected by Architect. [Yellow]
- J. Cast Abrasive Accessibility Strips and Stairs: Extruded aluminum with integral anchor and filled with abrasive granules in epoxy binder; Model ST-SF-N by Nystrom, Inc., 800-547-2635, Type T-24 by American Safety Tread Company, Inc., 800-245-4881, Type WP-24A by Wooster Products, Inc., 330-264-2844, or equal.
 - 1. Colors: As selected by Architect. [Yellow]

2.8 CONCRETE DESIGN AND CLASS

- A. Designed Strength and Classes of Concrete: The following mixes are not applicable to concrete items exceeding 4 feet in height above the adjacent grade.
 - 1. Class "B": Concrete shall have 1 inch maximum size aggregate, shall have 3000 pounds per square inch minimum at 28 day strength with a maximum water to cementitious ratio no greater than 0.50.
 - a. Location of Use: Exterior slabs, including walks, vehicular paved surfaces, manhole bases, poured-in-place drop inlets, curbs, valley gutters, curb and gutter, and other concrete of like nature.
 - 2. Class "D" concrete of 1 inch maximum size aggregate shall have 3500 pounds per square inch 28 day strength with a maximum water to cementitious materials ratio of 0.55.
 - a. Location of Use: Footings and retaining walls not attached to buildings, and planter walls, monument signs, and other site concrete not described for use in Class "B".
- B. Slump Limits: Provide concrete, at point of final discharge of proper consistency as tested in accordance with ASTM C143/C143M with slumps of 4 inches, plus or minus 1 inch.
- C. Mix Design: Concrete shall be designed for strength in accordance with provisions of CBC Section 1905A.

1. Should the Contractor desire to pump concrete, a modified mix design will need to be submitted for review.
 2. Fly ash may be used in concrete to improve workability in amounts up to 15 percent of the total cementitious weight.
- D. Air Entrainment: Provide at concrete paving / flatwork, including concrete ramps and stairs in accordance with local jurisdiction minimum requirements, but no less than 3 percent of the volume of concrete.
- E. Glare Reduction Additive:
1. General:
 - a. Provide at exterior concrete slabs, walks, ramps, stairs, including bleachers, and other exposed flatwork to eliminate glare.
 - b. Omit glare reduction colorant where color hardener, integral color, and stain treatment of concrete are scheduled.
 2. Quantity: As required to match approved sample but not exceed 2 pounds of colorant per cubic yard of concrete.
 3. Add colorant to mix in accordance with manufacturer's printed instructions.
- F. Coloring Agent:
1. Quantity: Add pigment as required to result in hardened concrete color consistent with approved sample but not exceeding maximum dosage per sack of cement as recommended by manufacturer based on total cementitious materials of mix design.
 2. Add pre-mixed colorant bags to mix in accordance with manufacturer's printed instructions.

2.9 MIXING OF CONCRETE

- A. Conform to requirements of CBC Chapter 19A.
- B. Concrete shall be mixed until there is uniform distribution of material and mass is uniform and homogenous; mixer must be discharged completely before the mixer is recharged.
- C. Concrete shall be Ready-Mixed Concrete: Mix and deliver in accordance with the requirements set forth in ASTM C94/C94M and ACI 301. Batch Plant inspection may be waived in accordance with CBC Section 1705A.3.3, when approved by the Project Engineer and DSA.
1. Furnish batch certificates for each batch discharged and used in the work.
 2. Approved Testing Laboratory shall check the first batching at the start of the work and furnish mix proportions to the Licensed Weighmaster.
 3. Licensed Weighmaster shall identify materials as to quantity and to certify to each load by ticket.
 4. Delivery tickets are to accompany each truck and shall be kept in the job superintendent's file. Delivery tickets must indicate the following information or be subject to rejection:

- a. Name of Project.
 - b. Supplier of concrete.
 - c. Truck identity and ticket serial number.
 - d. Date of delivery.
 - e. Brand of cement.
 - f. Cement content.
 - g. Strength classification.
 - h. Batching time.
 - i. Point of deposit.
 - j. Total amount of water.
 - k. Weight of aggregate.
 - l. Daily temperature.
 - m. Number of cubic yards in load.
 - n. Admixture content.
 - o. Name of Contractor.
 - p. Name of driver.
 - q. Time loaded and first mixing of concrete.
 - r. Reading of revolution counter.
 - s. Color additive.
5. Ticket shall be transmitted to Project Inspector by truck driver with load identified thereon. Project Inspector will not accept load without load ticket identifying mix and will keep daily record of pours, identifying each truck, its load and time of receipt, and will transmit two copies of record to DSA.
 6. At end of project, Weighmaster shall furnish affidavit to DSA on form satisfactory to DSA, certifying that all concrete furnished is in conformance with proportions established by mix designs.
 7. Placement of concrete shall occur as rapidly as possible after batching and in a manner which will assure that the required quality of the concrete is maintained. In no case may concrete be placed more than 90 minutes from batch time.
 - a. When air temperature is between 85 and 90 degrees F, reduce maximum batching to discharge time from 90 minutes to 75 minutes.
 - b. When air temperature is above 90 degrees F, reduce maximum batching to discharge time to 60 minutes.
 8. Water may be added to the mix only if neither the maximum permissible water-cement ratio nor the maximum slump is exceeded.
 - a. The quantity of water used for each batch shall be accurately measured.
 - b. In no case shall more than 10 gallons of water be added to a full 9-yard load, or 1 gallon per yard on remaining concrete within the drum, providing load tag indicates at time of mixing at plant an allowance for additional water.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Confirm general layout, grade, and joint pattern layout with the Architect prior to placing concrete.
- B. Verify that gradients and elevations of the base are correct, and that the base is dry.
- C. Contractor shall report in writing to the Architect prevailing conditions that will adversely affect satisfactory execution of the work of this Section.
 - 1. Do not proceed with work until unsatisfactory conditions have been corrected.
- D. Forms and reinforcements are subject to approval by the Project Inspector as specified in Article FIELD QUALITY CONTROL.

3.2 PREPARATION

- A. Remove frost, water, and other foreign materials from form surfaces, reinforcement, and embedded items against which concrete will be placed.
- B. When the ambient temperature necessitates the use of cold or hot weather concreting, make provisions in advance of concrete placement.
- C. Before placing concrete, clean tools and equipment, and remove debris from areas to receive concrete.
- D. Clean reinforcing and other embedded items of coatings, oil, mud and soil that may impair bond with concrete.
- E. Slab-On-Grade: After subgrade has been approved by Geotechnical Engineer, install specified drainage rock base material to thickness shown. Rock base shall be implemented and compacted in accordance with the Geotechnical Report and recommendations of the Geotechnical Engineer.

3.3 INSTALLATION – FORMWORK

- A. Form material shall be straight, true, sound and able to withstand deformation due to loading and effects of moist curing. Materials which have warped or delaminated, or require more than minor patching of contact surfaces, shall not be reused.
- B. Build forms to shapes, lines, grades and dimensions indicated. Construct formwork to maintain tolerances required by ACI 301. Forms shall be substantial, tight to prevent leakage of concrete, and properly braced and tied together to maintain position and shape. Butt joints tightly and locate on solid backing. Chamfer corners where indicated. Form bevels, grooves and recesses to neat, straight lines. Construct forms for easy removal without hammering, wedging or prying against concrete.
- C. Space clamps, ties, hangers and other form accessories so that working capacities are not exceeded by loads imposed from concrete or concreting operations.

- D. Build openings into vertical forms at regular intervals if necessary to facilitate concrete placement, and at bottoms of forms to permit cleaning and inspection.
- E. Build in securely braced temporary bulkheads, keyed as required, at planned locations of construction joints.
- F. Before placement of reinforcing steel, coat faces of all forms to prevent absorption of moisture from concrete and to facilitate removal of forms. Apply specified material in conformance with manufacturer's written directions.
 - 1. Seal all cut edges.
 - 2. Before re-using form material, inspect, clean thoroughly, and recoat.
- G. Slope tie-wires downward to outside of wall.
- H. Brace, anchor and support all cast-in items to prevent displacement or distortion.
- I. During and immediately after concrete placing, tighten forms, posts and shores. Readjust to maintain grades, levels and camber.
- J. Concrete Paving, Curbs, Curb and Gutters, Ramps:
 - 1. Expansion Joints: Install at locations indicated, and so that maximum distance between joints is 20 feet for exterior concrete unless otherwise shown. Expansion joint material shall be full depth of concrete section. Recess for snap cap and sealant when required.
 - 2. Curbs, Valley Gutter, and Curb & Gutter: Install expansion joints at 60 feet on center, except when placing adjacent to concrete walks, the expansion joints shall align with the expansion joints shown for the concrete walks. Expansion joint material shall be full depth of concrete section. Recess for snap cap and sealant when required.
 - 3. Isolation Joints: 3/8-inch felt between walls and exterior slabs or walks so that paved areas are isolated from all vertical features, unless specifically noted otherwise on plans.
 - 4. Exterior Concrete Paving: Install expansion joints at 20 feet on center maximum, both directions, unless shown otherwise on plans.
 - 5. Ramps: Whether shown or not, all ramps shall have control joints and expansion joints.
 - a. Control joints on ramps shall be aligned and placed in between the vertical posts for the handrails. The curbs, if required shall have control joints that align with the handrail posts.
 - b. Expansion joints shall be placed at the upper, intermediate, and bottom landings.
- K. Inspection: Refer to Article FIELD QUALITY CONTROL.

3.4 INSTALLATION – REINFORCING

- A. General: Reinforcing shall be accurately placed at locations indicated on the drawings within required tolerances and providing required clearances. Reinforcement shall be

secured prior to placement of concrete such that tolerances and clearances are maintained. Coverage shall be in accordance with Section 1907A.7 of the CBC.

1. Reinforcement must be in place before concreting is begun.
 2. Keep a person on the job to maintain position of reinforcing as concrete is placed.
 3. All expansion and construction joints in concrete shall have dowels of size and spacing as shown on the Drawings, or as approved by Architect.
 4. Give notice whenever pipes, conduits, sleeves, and other construction interferes with placement; obtain method of procedure to resolve interferences.
- B. Additional reinforcing steel shall be placed around all utility boxes, valve boxes, manhole frames and covers that are located within the concrete placements.
1. The bars shall be placed so that there will be a minimum of 1-1/2-inch clearance and a maximum of 3-inch clearance. The reinforcing steel shall be placed mid-depth of concrete slab.
- C. At right angles or intersections of concrete walks, additional 2 feet x 2 feet #5, 90 degree bars shall be added at all inside corners for additional crack control. The bars shall be placed 2 inches from concrete forms and supports, at mid-depth of slab.
- D. Reinforcing steel shall be adequately supported by approved devices on centers close enough to prevent any sagging.
- E. Placing Tolerances:
1. In accordance with ACI 301 or CRSI/WCRSI Recommended Practice for Placing Reinforcing Bars, unless otherwise shown.
 2. Clear distance between parallel bars in a layer shall be no less than 1 inch, the maximum bar diameter shall not exceed 1-1/2 times the maximum size of coarse aggregate.
- F. Splices:
1. General: Unless otherwise shown on drawings, splice top reinforcing at midspan between supports, splice bottom reinforcing at supports, and stagger splices. Bar laps shall be wired together. Reinforcing steel laps shall be as follows:
 - a. Length of Lap Splices in Concrete:
 - 1) No. 4 bar: 24 inches minimum.
 - 2) No. 5 Bar: Not less than 62 bar diameters.
 - 3) No. 6 Bar: 56 inches minimum.
 - 4) No. 7 Bars and Larger: Not less than 93 bar diameters.
 - b. All splices shall be staggered at 5 feet minimum from adjacent splices.
- G. Inspection: Refer to Article FIELD QUALITY CONTROL.

3.5 PLACING OF CONCRETE – GENERAL

- A. Adjacent finish surfaces shall be protected at all times during the concrete pour and finishing. Verify that all formwork is tight and leak-proof before concrete is poured. Finish work defaced during the concrete pour and finishing shall be replaced at no extra cost to Owner.
- B. Remove wood chips, sawdust, dirt, loose concrete and other debris just before concrete is to be poured. Use compressed air for inaccessible areas. Remove all standing water from excavations.
- C. Transport concrete from mixer to place of final deposit as rapidly as practicable by methods which will prevent separation or loss of ingredients. Deposit as close as practicable in final position to avoid re-handling or flowing. Partially hardened concrete must not be deposited in work. Concrete shall not be wheeled directly on top of reinforcing steel.
- D. Keep excavations free of standing water, but moisture condition sub-grade before concrete placement.
- E. Placing: Once started, continue concrete pour continuously until section is complete between predetermined construction joints. Prevent splashing of concrete onto adjacent forms or reinforcement and remove such accumulation of hardened or partially hardened concrete from forms or reinforcement before work proceeds in that area. Free fall of concrete shall not to exceed 4'-0" in height. If necessary, provide lower openings in forms to inject concrete and to reduce fall height.
- F. Remove form spreaders as placing of concrete progresses.
- G. Place footings as monolithic and in one continuous pour.
- H. Compacting: Concrete shall be compacted by mechanical vibrators.
 - 1. Concrete shall be thoroughly worked around reinforcement and embedded fixtures and into corners of forms.
 - 2. Vibrating shall not be applied to concrete which has already begun to initially set or be continued so long as to cause segregation of materials.

3.6 REMOVAL OF FORMS

- A. Remove without damage to concrete surfaces.
 - 1. Sequence and timing of form removal shall insure complete safety of concrete structure.
 - 2. Forms shall remain in place for not less than the following periods of time. These periods represent cumulative number of days during which temperature of air in contact with concrete is 60 degrees F and above.
 - a. Vertical Forms of Foundations, Walls and All Other Forms Not Covered Below: 5 days.
 - b. Concrete Paving Edge Screeds or Forms: 7 days.

3. Concrete shall not be subjected to superimposed loads (structure or construction equipment) until it has attained its full design strength and not for a period of at least 21 days after placing. Concrete systems shall not be subjected to construction loads in excess of design loads.
- B. Patching: Install specified patching mortar per manufacturer's recommendations. Repairs to defective concrete which affect the strength of any structural concrete member or component are subject to approval by the architect and DSA.

3.7 CONCRETE PAVING

- A. Concrete paving shall be formed and finished to required line and grades true and flat with a maximum tolerance of 1/8-inch in 10 feet for flatness and to slopes indicated.
- B. Concrete vibrator shall be used to assist concrete placement. Contractor shall have spare concrete vibrator on site during concrete placement.
- C. Thoroughly water and soak the subgrade of exterior concrete paving, curbs, curb and gutters, with multiple daily waterings for at least three days or as required to achieve required moisture content prior to the concrete pour in order to place the subgrade soils in full expansion.
 1. Provide damming as required to keep standing water within the formed area and to allow for proper saturation and full expansion of the subgrade soils.
 2. Remove standing water before concrete placement.
- D. Construction Joints:
 1. Keep exposed concrete face of construction joints continuously moist from time of initial set until placing of concrete; thoroughly clean contact surface by chipping entire surface not earlier than 5 days after initial pour to expose clean hard aggregate solidly embedded, or by approved method that will assure equal bond, such as green cutting.
 2. If contact surface becomes contaminated with soil, sawdust or other foreign matter, clean entire surface and re-chip entire surface to assure proper adhesion.

3.8 FINISHING

- A. Concrete Paving: Finish surface as required by ACI 302.1R using manual and vibrating screeds to place concrete level and smooth.
 1. Under no circumstances shall water be added to the top surface of freshly placed concrete.
 2. Use "jitterbugs" or other special tools designed for the purpose of forcing the course aggregate below the surface leaving a thick layer of mortar 1 inch in thickness.
 3. After tamping the concrete, wood float surface to a true and even plane.
 4. After floating with a wood bull float, make 2 passes with a steel Fresno trowel to start sealing the concrete surface.

5. While concrete is still wet but sufficiently hardened to bear a persons' weight on knee boards, start troweling with a steel hand trowel or a machine trowel in larger areas. Use sufficient pressure to bring moisture to surface.
 6. After surface moisture has disappeared, finish concrete utilizing steel, hand or power trowel.
 7. Completed surface shall be free from trowel marks, depressions, ridges or other blemishes. Tolerance for flatness shall be 1/8-inch in 10 feet.
 8. Provide final finish as follows, unless otherwise indicated:
 - a. Medium Broom Finish: Typical finish to be used at all exterior walks, stairs and ramps. Brooming direction shall run perpendicular to slope to form non-slip surface.
- B. Curb Finish: Steel trowel.
- C. Joints and Edges:
1. Mark-off exposed joints, where indicated, with 1/4-inch radius x 1 inch deep jointer or edging tool. Joints shall be clean, cut straight and parallel or square with respect to concrete walk edge.
 2. Tool edges of control joints, walk edges, and wherever concrete walk adjoins other material or vertical surfaces. Expansion joints shall be constructed as detailed on plans.
 3. The expansion joints shall be full depth as shown in the Drawings. Failure to do so will result in non-compliance and shall be immediately machine cut by the Contractor at its expense.

3.9 CURING

- A. Formed Concrete:
1. Keep forms and top on concrete between forms continuously wet until removal of forms, 7 days minimum.
 2. Maintain exposed concrete in a continuous wet condition for 14 days following removal of forms.
- B. Concrete Paving, Curb, Curb and Gutter, Valley Gutter:
1. Cure utilizing curing compound. If applicable, the Contractor shall verify that the approved curing compound is compatible with the approved colorant system.
 2. Curing compound shall be applied in a wet puddling application. Spotty applications shall be reason for rejection and possibly concrete removal and replacement at the contractor's expense with no compensation from the Owner.
- C. No curing compound shall be applied to areas scheduled to receive resilient track surface including, curbs, ramps, runways, and similar items.

3.10 DEFECTIVE CONCRETE

- A. General:

1. Determination of defective concrete shall be made by the Architect or Engineer whose opinion shall be final in identifying areas to be replaced, repaired or patched.
2. As directed by Architect, cut out and replace defective concrete.
 - a. Defective concrete shall be removed from the site.
 - b. No patching is to be done until surfaces have been examined by Architect and permission to begin patching has been provided.
 - c. Permission to patch an area shall not be considered waiver of right by the Owner to require removal of defective work, if patching does not, in opinion of Architect, satisfactorily restore quality and appearance of surface.
 - d. Remove and replace concrete if repair to an acceptable condition is not feasible.

B. Defective Concrete Is:

1. Concrete that does not match the approved mix design for the given installation type.
2. Concrete not meeting specified 28-day strength.
3. Concrete which contains rock pockets, voids, spalls, transverse cracks, exposed reinforcing, or other such defects which adversely affect strength, durability or appearance.
4. Concrete which is incorrectly formed, out of alignment or not plumb or level, or outside of the maximum tolerance for flatness and slopes indicated.
5. Concrete containing embedded wood or debris.
6. Concrete having large or excessive patched voids which were not completed under Architect's direction.
7. Concrete not containing required embedded items.
8. Concrete with excessive shrinkage, transverse cracking, crazing, curling; or defective finish.
9. Concrete that is unsuitable for placement or has set in truck drum for longer than 90 minutes from the time it was batched.
10. Concrete where expansion joint filler that is not isolating the full depth of the concrete section, and not recessed as required for backer rod and sealant where required.
11. Concrete that is excessively wet or excessively dry and will not meet the minimum or maximum slump required per mix design.
12. Finished concrete with oil stains from equipment use, and or rust spots that cannot be removed.
13. Concrete with control joints (weakened planed joints) that do not meet the required minimum depth shown on the drawings.
14. Concrete not meeting slip-resistance requirements.

C. Flatwork: The Owner reserves the right to survey the flatwork, to determine if flatwork is outside of the maximum tolerance for flatness and slopes as indicated.

1. If the flatwork is found to be out of tolerance, then the Contractor is required to replace concrete at no additional expense to the Owner.
2. Determination of flatwork flatness, surveying and remedial work must be completed far enough in advance so that the project schedule is maintained, delays are avoided, and the new flatwork or flatwork repairs are properly cured.
3. The Contractor will be responsible for reimbursing the Owner for costs associated with re-surveying to verify compliance of work remediated by the Contractor.

3.11 SEALANT

- A. Apply sealant in compliance with manufacturer's instructions, using hand guns or pressure equipment with proper nozzle size, on clean, dry, properly prepared substrates.
- B. Force sealants into joint against sides of joint to make uniform. Avoid pulling of the sealant from the sides. Fill sealant space completely with sealant.
- C. Finished joints shall be straight, uniform, smooth, and neatly finished.
- D. Remove any excess sealant from adjacent surfaces of joints utilizing the manufacturer's recommended solvent and cleaning processes. Leave the work in a neat, clean condition.

3.12 FIELD QUALITY CONTROL

- A. Inspection of Forms and Reinforcing:
 1. Approval of forms and reinforcing steel must be received from Project Inspector prior to pouring concrete.
 2. Notice of readiness to place first pour shall be given to Project Inspector, DSA, Architect, and Engineer not less than 48 hours prior to placement of concrete to allow for inspection.
 3. Pouring of concrete shall not proceed prior to completing requested adjustments to forms and reinforcing and without approval of Project Inspector.
- B. Testing of Concrete:
 1. Frequency and Samples for Testing:
 - a. Four identical cylinder samples for strength tests of each class of concrete placed each day shall be taken not less than once a day, or not less than once for each 50 cubic yards of concrete, or not less than once for each 2,000 square feet of surface area for slabs or walls.
 - b. In addition, samples for strength tests for each class of concrete shall be taken for seven-day tests at the beginning of the concrete work or whenever the mix or aggregate is changed.
 2. Testing:
 - a. Slump: Each truck's concrete shall be tested for slump before concrete is placed.
 - b. Strength:

- 1) Tests for strength will be conducted by Testing Agency on one cylinder at 7 days and two cylinders at 28 days. The fourth remaining cylinder will be available for testing at 56 days if the 28-day cylinder test results do not meet the required design strength.
 - 2) On a given project, if the total volume of concrete is such that the frequency of specified testing would provide less than five strength tests for a given class of concrete, tests shall be made from at least five randomly selected batches or from each batch if fewer than five batches are used.
- C. Slip-Resistance Testing: Owner's Testing Agency will perform testing on flatwork to verify compliance with specified slip-resistance.
1. The coefficient of friction will be measured by California Test 342 before pavement is opened to public traffic, but not sooner than 7 days after concrete placement
 2. Where paving is determined to have a coefficient of friction less than 0.30, Contractor is to repair and/or replace these surfaces at no cost to Owner.

3.13 CLEANING

- A. Upon completion of work of this Section promptly remove from the working area all scraps, debris and surplus material of this Section.
- B. Clean excess material from surface of all concrete walks and utility structures.
- C. Power wash concrete surfaces to remove stains, dried mud, tire marks, and rust spots.
- D. Comply with any additional requirements of additive manufacturer for colored concrete.

3.14 PROTECTION

- A. Graffiti-resistant Coating:
 1. Surface Preparation: Prepare concrete surface to receive graffiti-resistant coating specified in Section 09 9623, Graffiti-Resistant Coatings, where indicated.
 2. Concrete must be clean, dry, and free of efflorescence and dust.
- B. Protect work and materials of this Section prior to and during installation, and protect the installed work and materials of other trades.
- C. In the event of damage during construction, make all repairs and replacements necessary to the approval of the Architect, at no additional cost to the Owner.

END OF SECTION

PART 1 – GENERAL

1.1 WORK INCLUDED

Provide all labor, materials, and tools necessary for the complete installation of a poured in place safety surfacing system composed of a wearing layer upper membrane and an underlying impact attenuation cushion layer as outlined in these specifications. The system should consist of but not necessarily be limited to the following:

- A. Section includes: Resilient playground surfacing poured in place system.
- B. Related work: Playground equipment and resilient playground surfacing sub base.
- C. Quality Assurance: Manufacturer should have manufactured and installed playground poured in place safety surfaces for a minimum of 5 years and meet current ASTM F-1292 Test Criteria. The installation of the poured in place product should be completed by FLEXGROUND. Manufacturer's detailed installation procedures should be submitted to the Architect and made part of the Bid Specifications.

1.2 SUBMITTALS

Prospective manufacturers and/or installers of the poured in place safety surfacing system should be required to comply with the following:

- A. The manufacturer must be experienced in the manufacturing of a poured in place safety surfacing system and provide references of five (5) specific installations in the last three (3) years.
- B. The installer must provide competent workmen skilled in this specific type of poured in place safety surfacing system installation. The designated supervisory personnel on the project must be competent in the installation of this material, including mixing of the materials, and spreading and compacting the materials correctly.
- C. Installation should be in accordance with ASTM F1292 for Impact Attenuation of surface system under and around playground equipment. The poured in place system to be installed in compliance with the Critical Fall Height as determined by the Playground Equipment.
- D. IPEMA Certification specific to poured in place safety surfacing.
- E. IPEMA certification specific to ½" layer of 1-4mm TPV over cushion layer .5mm TPV or EPDM IPEMA certification not acceptable.
- F. Manufacturer should provide written instructions for recommended maintenance practices.
- G. Manufacturer should submit color samples for customer verification. Color samples shall be 6" x 6" of ½" top wear course layer with aromatic or aliphatic binder – per client selection or specification; or 8 oz clear plastic jars with specified colored granules. Sample submittal format per client preference.

1.3 DEFINITIONS

PLAYGROUND PROTECTIVE SURFACES
SECTION 32 1816.13
3595001

- A. EPDM granules: EPDM rubber (ethylene propylene diene monomer (M-class) rubber), a type of synthetic rubber, is an elastomer characterized by a wide range of applications. The M refers to its classification in ASTM standard D-1418; the M class includes rubbers having a saturated chain of the polymethylene type.
- B. Critical Fall Height: A critical fall height (CFH) is the maximum height of fall from play equipment to the ground. It is important to note that safety surfaces do not prevent injury but aim to lessen the severity of any injury that may occur on falls from height.
- C. Fall Height: Fall height is a measurement defined as the vertical distance between a designated play surface and the protective surfacing beneath it.
- D. TPV: Thermoplastic Vulcanized Elastomer. Developed using resin and synthetic rubber with higher UV stabilization.
- E. SBR: Styrene-butadiene or styrene-butadiene rubber (SBR) describe families of synthetic rubbers derived from styrene and butadiene.

1.4 ASTM TESTING STANDARDS – FlexGround Standard meets or exceeds all required ASTM standards below.

- A. ASTM D624 Standard Test Method for Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomers.
- B. ASTM D2859 Standard Test Method for Flammability of Finished Textile Floor Covering Materials
- C. ASTM E303 Standard Test Method for Measuring Surface Frictional Properties Using the British Pendulum Tester
- D. ASTM F1292 Standard Specification for Impact Attenuation of Surface Systems Under and Around Playground Equipment
- E. ASTM F1951 Standard Specification for Determination of Accessibility of Surface Systems Under and Around Playground Equipment
- F. ASTM C1028 Standard Test Method for Determining the Static Coefficient of Friction of Ceramic Tile and Other Like Surfaces by the Horizontal Dynamometer Pull Meter Method – This standard replaces ASTM D2047
- G. ASTM D412 Standard Test Methods for Vulcanized Rubber and Thermoplastic Rubbers and Thermoplastic Elastomers- Tension

1.5 WARRANTY AND MAINTENANCE

The bidder and/or poured in place safety surfacing manufacturer must provide the following:

- A. The poured in place safety surfacing manufacturer should provide a warranty to the owner that covers defects in materials and workmanship of the rubber for a period of **FIVE (5) years** from the date of Substantial Completion.

PLAYGROUND PROTECTIVE SURFACES
SECTION 32 1816.13
3595001

- B. The manufacturer's warranty should include general wear and tear. The warranty should specifically exclude vandalism, high heel punctures, acts of war or acts of nature beyond the control of the owner or the manufacturer.
- C. All poured in place warranties should be limited to repair or replacement of the affected areas and should include all necessary materials, labor, transportation costs, etc. to complete said repairs. All warranties are contingent on the full payment by the owner of all pertinent invoices and adherence to any required maintenance procedures.
- D. The installer should clean the jobsite of excess materials and, if necessary, backfill any excavation around the perimeter with earth or other appropriate fill material.
- E. The manufacturer should instruct the owner's personnel on proper maintenance and repair of the ENDURAFLEX safety surface.

PART 2 – PRODUCTS

- A. The FLEXGROUD ENDURAFLEX, or equal, poured in place safety surfacing system should be in accordance with the following:
- B. A dual durometer poured in place system with a wearing layer upper membrane and an underlying impact attenuation cushion layer. The finished surface should be porous and capable of being installed at varying thickness to comply with the Critical Fall Height requirements of the playground equipment.
- C. FLEXGROUND primer is a 100% solids urethane primer/sealer. It is designed with low viscosity and penetrating abilities making this an ideal priming urethane.
- D. The cushion layer should be a mixture of black recycled SBR rubber buffings mixed with a 100% solids moisture cured MDI Polyurethane binder or aliphatic (100 pounds of SBR rubber buffings to 12 pounds of binder) installed at the appropriate thickness. As an upgrade, or if recycled SBR rubber buffings are not available, 5/8" chunk rubber with correct amount of urethane for impact attenuation and longevity may be used. **Chunk rubber shall not include SBR derived from rubber tires.** It must be high quality preconsumer recycled rubber containing EPDM. The cushion layer should be porous.
- E. The ENDURAFLEX wearing surface should be manufactured from 1-4mm Thermoplastic Vulcanized (TPV) virgin colored rubber granules bonded by FLEXGROUND binder, 100% solids moisture cured Polyurethane binder or aliphatic (110 pounds of TPV to 22 pounds of binder), and applied to a minimum thickness of 1/2" (12.7 mm) over the cushion layer.
- F. The system color should be selected from Manufacturer's Color Chart by owner prior to bid.
- G. High Wear Coating: Flexgrout as manufactured by Flexground, or corresponding equal.

PART 3 – EXECUTION

3.1 GENERAL

PLAYGROUND PROTECTIVE SURFACES
SECTION 32 1816.13
3595001

- A. Install all systems in full accordance with manufacturer's recommendations.
- B. Slope across finished product shall not be greater than 2% in any direction. Contractor shall carefully checked grades during installation of perimeter curb and play equipment access points to assure that all slopes are less than 2%.

3.2 SITE PREPARATION AND BASE

The ENDURAFLEX site preparation and base should be in accordance with the following:

- A. The sub-base will have a slope as per design.
- B. The base aggregate should consist of free-draining stone compacted to 95%, thickness per plan. Finish slope of porous aggregate should be 2% from the centerline of the area to the perimeter, and the grade should not vary more than a quarter inch (1/4") in ten feet (10').
- C. The sub-base should be compacted using vibrating tamper, to approximately 95% Proctor density.
- D. The sub-grade should no longer have any vegetation.
- E. Subgrade prior to aggregate installation: Sublevel grade is to be compacted prior to the ABC aggregate installation. Particular attention should be paid to areas of disturbed earth such as where footers for playground equipment enter the ground. Concrete should be poured to the top of sublevel surface.
- F. The poured in place safety surfacing manufacturer and architect will accept the aggregate base in writing prior to the installation of the poured in place system.
- G. Any alterations must be agreed between all parties.

3.3 INSTALLATION

- A. The poured in place safety surfacing installer should strictly adhere to the installation procedures outlined under these sections. Any variance from these requirements should be accepted in writing by the manufacturer's onsite representative and submitted to the architect/owner, verifying that the changes do not in any way affect the warranty.

3.4 PERIMETER

- A. A urethane primer should be applied to concrete, asphalt or wood surfaces at a rate of 200-250 square feet per gallon. The entire area does not need to be primed at once, instead, prime about 700 square feet at a time. This procedure should be continued until all areas are complete.
- B. The urethane primer should be applied to any playground equipment that will be surrounded by the poured in place safety surfacing system.

3.5 CUSHION LAYER

- A. Provide a single pour installation for each area. No seams allowed in material.

PLAYGROUND PROTECTIVE SURFACES
SECTION 32 1816.13
3595001

- B. The components of the poured in place safety surfacing should be mixed on site in a mixer to ensure a comprehensive mix according to manufacturer's instructions.
- C. The cushion layer comprised of SBR buffings shall be mixed with the MDI moisture cure polyurethane binder at a rate of 12% of the total weight of the material thoroughly so that the binder is evenly dispersed into the rubber base.
- D. The cushion layer comprised of non-tire derived SBR & EPDM Chunk Rubber shall be mixed with the appropriate amount of urethane so that the binder is evenly dispersed into the rubber base.
- E. The cushion layer mix should then be spread and troweled to the desired depth and allow to cure for 24 hours.

3.6 WEAR COURSE LAYER

- A. Provide a single pour installation for each area. No seams allowed in finished product.
- B. The wear course layer should be mixed with 1-4mm TPV granules and urethane binder at a rate of 20% of the total weight of the materials so the granules are covered thoroughly and evenly.
- C. The wear course layer mix should be spread and troweled to a depth of a half inch ($\frac{1}{2}$ ") immediately after the application of primer.
- D. Where seams are required due to color change, a step configuration with a 4" overlap will be constructed to maintain wear surface integrity.
- E. The finished texture should be slip resistant, smooth and even.
- F. The poured in place surface should be allowed to cure for 24-72 hours or until dry to the touch.

3.7 GROUT SEALER AT HIGH WATER AREAS

- A. Provide at base of main access point to structure, at bottom of slides, beneath swings, other high traffic, high wear areas.
- B. The wear course layer should be sealed with a thermoplastic composite grout. FLEXGROUT should be spread with a trowel at a rate of 1 gallon per 30 square feet. Pressure should be applied to the trowel with enough force to push the grout into the wear course layer, rendering it impermeable. The finished texture should be slip resistant and even.
- C. The poured in place surface should be allowed to cure for 24-72 hours or until dry to the touch.
- D. Color Seal - The color seal should consist of a water based composite liquid. Color seal should be rolled (or can be sprayed) to completely cover entire surface. The color seal should be allowed to cure for 24-72 hours or until dry to touch.

3.8 CLEAN UP

PLAYGROUND PROTECTIVE SURFACES
SECTION 32 1816.13
3595001

- A. Trailer/ Large truck access will be necessary for the installation. In the case that access for trailer/truck is not available the owner or general contractor will be responsible for transporting material to the job site.
- B. Crew is responsible for protecting the surface only while on site. General Contractor or owner shall be responsible for the security of the surfacing overnight during installation, as well as during the surfacing's curing period upon completion of the install.
- C. Crew will leave site clean and shall remove all trash and debris.
- D. Owner/General contractor shall provide a dumpster for all waste and trash.

END OF SECTION

PART 1 – GENERAL

1.1 SUMMARY

- A. Provide all labor, materials, equipment, and tools necessary for the complete installation of an attenuated synthetic grass infill system as outlined in these specifications. The system should consist of but not necessarily be limited to the following:
- B. A vertical draining field base consisting of a four-inch layer of compacted ¾" Class 2 aggregate compacted to 95% and four-inch layer of Class 2 permeable base compacted to 90-95% relative compaction.
- C. A complete synthetic grass system, consisting of:
 - 1. Synthetic turf
 - 2. Cushion layer
 - 3. An infill system, consisting of a specially formulated non-expansive, coated, clean, dust free and specially sized silicon dioxide bead (Envirofill brand preferred).
- D. Quality Assurance: Manufacturer should have manufactured and installed synthetic grass surfaces for a minimum of 5 years. Manufacturer's detailed installation procedures should be submitted to the Architect and made part of the Bid Specifications.

1.2 RELATED REQUIREMENTS

- A. Section 01 5000, Temporary Facilities and Controls.
- B. Section 31 0000, Earthwork.
- C. Section 33 4000, Storm Drainage Utilities.

1.3 REREENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. ASTM D624 Standard Test Method for Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomers.
- C. ASTM D2859 Standard Test Method for Flammability of Finished Textile Floor Covering Materials
- D. ASTM E303 Standard Test Method for Measuring Surface Frictional Properties Using the British Pendulum Tester
- E. ASTM F1292 Standard Specification for Impact Attenuation of Surface Systems Under

and Around Playground Equipment

- F. ASTM F1951 Standard Specification for Determination of Accessibility of Surface Systems Under and Around Playground Equipment
- G. ASTM C1028 Standard Test Method for Determining the Static Coefficient of Friction of Ceramic Tile and Other Like Surfaces by the Horizontal Dynamometer Pull Meter Method – This standard replaces ASTM D2047
- H. ASTM D412 Standard Test Methods for Vulcanized Rubber and Thermoplastic Rubbers and Thermoplastic Elastomers- Tension

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Submittal Procedures:
 - 1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
 - 2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
 - 3. Sustainable Design Submittals shall comply with the additional requirements of Section 01 8113, Sustainable Design Requirements.
- B. Coordination:
 - 1. General Contractor shall coordinate work as herein specified, in accordance with drawings and as required to complete scope of work with all related trades.

1.5 ACTION SUBMITTALS

- A. Provide supplier's descriptive literature for all products to demonstrate compliance with specified attributes:

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For contractor / Installer.
Prospective manufacturers and/or installers of the turf should be required to comply with the following:
 - I. The turf manufacturer must be experienced in the manufacture of a no nail synthetic grass system and provide references of five (5) specific installations in the last three (3) years.
 - J. The turf installer must provide competent workmen skilled in no nail synthetic grass installation. The designated supervisory personnel on the project must be competent in the installation of this material, including gluing seams and proper installation of the infill mixture.
 - K. Installation should be in accordance with ASTM F1292 for Impact Attenuation of surface system under and around playground equipment. The poured in place system to be installed in compliance with the Critical Fall Height as determined by the Playground

Equipment (if any).

- L. Manufacturers should provide written instructions for recommended maintenance practices.

1.7 CLOSEOUT SUBMITTALS

- A. Guarantee: Submit subcontractor's guarantee.

1.8 QUALITY ASSURANCE

- A. Contractor / Installer shall have been in business for five (5) years providing/finishing similar size projects and complexity.
- B. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.
- C. All materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.

1.9 DELIVERY, STORAGE AND HANDLING

- A. Transport, store and handle in strict accord with the local jurisdiction.

1.10 FIELD CONDITIONS

- A. Contractor shall acquaint himself with all existing site conditions. If unknown active utilities are encountered during work, notify Architect promptly for instructions. Failure to notify will make Contractor liable for damage to these utilities arising from Contractor's operations subsequent to discovery of such unknown active utilities.
- B. Trench dewatering may be necessary. Contractor shall provide any and all tools, equipment and labor necessary for trench dewatering no matter what the source. Dewatering shall be continuous until all site utilities are installed and backfilled.

1.11 PROTECTION

- A. Adequate protection measures shall be provided to protect workers and passers-by on and off the site. Adjacent property shall be fully protected throughout the operations. Blasting will not be permitted. Prevent damage to adjoining improvements and properties both above and below grade. Restore such improvements to original condition should damage occur. Replace trees and shrubs outside building area disturbed by operations. Repair all trenches in grass areas with new sod (seeding not permitted) and "stake-off" for protection.
- B. Contractor shall be solely and completely responsible for working conditions at the job site, including safety of all persons and property during performance of the work. This requirement shall apply continuously and shall not be limited to normal working hours.
- C. Any construction review of the Contractor's performance conducted by the Architect or Owner is not intended to include review of the adequacy of the Contractor's safety measures, in, on or near the construction site.

SYNTHETIC TURF
SECTION 32 1816.16
3595001

- D. Provide shoring, sheeting, sheet piles and or bracing to prevent caving, erosion or gullyng of sides of excavation.
- E. Surface Drainage: Provide for surface drainage during period of construction in manner to avoid creating nuisance to adjacent areas. Keep all excavations free from water during entire progress of work, regardless of cause, source or nature of water.
- F. Adjacent streets and sidewalks shall be kept free of mud, dirt or similar nuisances resulting from earthwork operations.
- G. The site and adjacent influenced areas shall be watered as required to suppress dust nuisance.
- H. Trees: Carefully protect existing trees which are to remain.

1.12 TRENCH SAFETY PROVISIONS

- A. General Contractor shall be solely responsible for safety design, construction and coordination with agencies having jurisdiction. If such plan varies from shoring system standards established by Construction Safety Orders, plan shall be prepared by registered civil or structural engineer.
- B. Nothing herein shall be deemed to allow use of shoring, sloping or protective system less effective than that required by Construction Safety Orders of California State Division of Industrial Safety.
- C. When trenching through paved surface, provide steel trench plates to cover open trenches daily until trenches are backfilled.

1.13 SEASONAL LIMITS

- A. No backfill material shall be placed, spread or rolled during unfavorable weather conditions. When work is interrupted by heavy rains, full operations shall not be resumed until field tests indicate that moisture content and density of fill are satisfactory.
- B. Material above optimum moisture shall be processed per Section 31 0000, Part 3, Article "Subgrade Preparation".

1.14 TESTING

- A. General: Refer to Section 31 0000, Part 1, Article "Testing" and Part 3, Article "Testing and Observation".

1.15 WARRANTY AND MAINTENANCE

- A. The bidder and/or the turf manufacturer must provide the following:
- B. The turf manufacturer should provide a warranty to the owner that covers defects in materials and workmanship of the turf for a period of **FIVE (5) years** from the date of Substantial Completion, and **TWO (2) years** on seams.
- C. The manufacturer's warranty should specifically exclude vandalism, acts of War and acts of Nature beyond the control of the owner of the manufacturer.

- D. All turf warranties should be limited to repair or replacement of the affected areas and should include all necessary materials, labor, transportation costs, etc. to complete said repairs.
- E. All warranties are contingent upon full payment by the owner of all pertinent invoices and owner, at owner's expense, completing a full power-brooming and "top-off" of lost infill at two-year intervals from date of substantial completion.
- F. The bidder should provide a maintenance program to the owner. The warranty should be subject to compliance with said maintenance program in addition to items named above.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

The synthetic turf material and resilient cushion should be in accordance with the following:

- A. Acceptable Manufacturer: Beyond Grass Premium or Tencate Grass.
- B. Or approved equal.

2.2 SYSTEM REQUIREMENTS

- A. A poured in place system with a synthetic grass wearing layer upper membrane and an underlying impact attenuation cushion layer. The finished surface should be porous and capable of being installed at varying thickness to comply with Critical Fall Height requirements of playground equipment.
- B. The cushion layer should be a mixture of black recycled rubber mixed with a 100% solids moisture cured aromatic Polyurethane binder (100 pounds of rubberized cushion layer to 12 pounds of binder) installed at the appropriate thickness.
- C. Synthetic Turf shall be:
 - 1. A 1-1/2" monofilament polyethylene with brown thatch yarn, formulated for superior wear resistance and a secondary proprietary polyethylene thatch. Product must have built-in antimicrobial protection to inhibit the growth of bacteria, mold, mildew, and reduce odor.
 - 2. The system should be tufted with a minimum of 60 ounce of yarn per square yard. The system should also include a primary woven polypropylene backing and a polyurethane secondary backing. Finish coating shall be at 22 ounces per square yard.
 - 3. The machine gauge shall be 1/2". Tufted pile height is 1-1/2".
 - 4. Total fabric weight shall be at least 88 ounces per square yard.
 - 5. The finished product should also include perforations to ensure drainage greater than 30 inches per hour. Non-perforated systems should not be acceptable alternates for purposes of this specification.

- D. The turf should be delivered in 15' wide rolls.
- E. All lines, numbers and markings indicated on plans should be permanently inlaid. Painted lines should not be an acceptable alternative for purposes of this specification.
- F. The fiber should be green in color to simulate natural grass as closely as possible and treated with UV inhibitor, guaranteed a minimum of eight years.
- G. The infill system should be an a non-expansive engineered coated, clean, dust free and specially sized silicon dioxide beads.
- H. Latex backed turf shall not be acceptable. All adhesives must also be latex free.

PART 3 – EXECUTION

3.1 SITE PREPARATION AND BASE

- A. The sub-base will have a slope per plan.
- B. The base aggregate should consist of a minimum of four inches (4") of ¾" Class 2 aggregate compacted to 95% and four inches (4") of ¾" Class 2 permeable aggregate base compacted to between 90%-95%.
- C. The sub base should be installed in two inch (2") lifts to appropriate thickness.
- D. The sub-base should be compacted using vibrating tamper, to approximately 95% Proctor density.
- E. The sub-base should no longer have any vegetation.
- F. Subgrade prior to aggregate installation: Sublevel grade is to be compacted prior to the ABC aggregate installation. Particular attention should be paid to areas of disturbed earth such as where footers for playground equipment enter the ground. Concrete used to fill said areas/footers should be poured to the top of sublevel surface.
- G. The sub-base installer and architect will accept the aggregate base in writing prior to the installation of the poured in place system.
- H. Any alterations must be agreed between all parties.

3.2 INSTALLATION

The synthetic turf safety surfacing installer should strictly adhere to the installation procedures outlined under these sections. Any variance from these requirements should be accepted in writing by the manufacturer's onsite representative and submitted to the architect/owner, verifying that the changes do not in any way affect the warranty.

A. Cushion Layer

1. The components of the poured in place safety surfacing should be mixed on site in a mixer to ensure a comprehensive mix according to manufacturer's instructions.
2. The cushion layer comprised of SBR buffings shall be mixed with the aromatic moisture cured polyurethane binder at a rate of 12% of the total weight of the material thoroughly so that the binder is evenly dispersed into the rubber base.
3. The cushion layer comprised of non-tire derived SBR & EPDM Chunk Rubber shall be mixed with the appropriate amount of urethane so that the binder is evenly dispersed into the rubber base.
4. The cushion layer mix should then be spread and troweled to the desired depth and allow to cure for 24 hours.

B. Synthetic Turf Layer

1. The synthetic grass should be cut and laid out across the area, and utilizing standard state-of-the-art gluing procedures, each roll should be seamed to the next.
2. The edge of the synthetic turf should be stapled or nailed to header/anchor board.
3. A strip of seam tape should be used to seam the rolls of material. The specified glue should be a one part urethane adhesive (SeamTight).

C. Infill

1. The infill material shall be spread evenly, at a rate of 2 lbs per square foot with a large fertilizer type spreader. The infill will be spread in strict accordance with the turf installer's specifications.
2. Between each application of infill, the field area should be brushed with a motorized rotary nylon broom.
3. Caution: Too much fiber exposed (not enough infill) will cause the fibers to mat or crush with heavy foot traffic. This will lead to premature wearing of the fiber and will void any manufacturer's warranty. No Crumb Rubber shall be used as infill.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Domestic water piping system.
 - 2. Fire protection piping systems.
 - 3. Sewer piping system

1.2 RELATED REQUIREMENTS

- A. Section 01 5000, Temporary Facilities and Controls.
- B. Section 01 6116, Volatile Organic Compound (VOC) Restrictions, for VOC limits pertaining to adhesives, sealants, fillers, primers, and coatings.
- C. Section 01 8113, Sustainable Design Requirements, for CAL-Green [and Collaborative for High Performance Schools (CHPS)] general requirements and procedures.
- D. Section 31 0000, Earthwork.
- E. Section 31 2333, Trenching and Backfilling.
- F. Section 32 1600, Site Concrete.

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CAL Green), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- C. California Plumbing Code, (CPC), edition as noted on the Drawings.
- D. California State Health and Safety Code Section 116875, Lead Free Public Water Systems.
- E. Local Jurisdiction: Any work within the street, highway or right-of-way shall be performed in accordance with the requirement of the governmental agencies having jurisdiction, and shall not begin until all of those governing authorities have been notified.
- F. ASTM International (ASTM):
 - 1. D422-63: Test Method for Particle Size Analysis of Soil.
 - 2. D698-00: Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures, Using 5.5 lb (2.49 Kg) Rammer and 12 inch (304.8 mm) Drop.

3. D1556-00: Test Method for Density of Soil in Place by the Sand-Cone Method.
4. D1557-02: Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 10 lb. (4.54 Kg) Rammer and 18 inch (457 mm) Drop.
5. D3017-05: Test Methods for Moisture Content of Soils and Soil-Aggregate Mixture by Nuclear Methods (Shallow Depth).
6. D4318-05: Test Method for Liquid Limit, Plastic Limit, and Plasticity Limit.

G. CALTRANS Standard Specifications.

H. CAL-OSHA, Title 8, Section 1590 (e).

I. NFPA 13, 24 and 25, per CFC chapter 80 and CBC chapter 35.

1.4 ADMINISTRATIVE REQUIREMENTS

A. Submittal Procedures:

1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
3. Sustainable Design Submittals shall comply with the additional requirements of Section 01 8113, Sustainable Design Requirements.

1.5 ACTION SUBMITTALS

- A. Provide supplier's descriptive literature for all products to demonstrate compliance with specified attributes.
- B. Substitution: Provide all data of proposed material being submitted as a substitution. Provide comparison with specified product data and identify all differences. Failure to provide comparison will be reason for rejection.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For contractor / installer.
- B. Provide sieve analysis from accredited testing lab on pipe bedding material. Analysis shall have a current date not older than project contract signing date.
- C. Sustainable Design:
1. General:
 - a. Submit information necessary to establish and document compliance with the California Green Building Standards Code.
 - b. Sustainable design submittals are in addition to other submittals.
 2. The following information shall be provided:
 - a. Adhesives and Sealants: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.

- b. Paints and Coatings: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.

1.7 CLOSEOUT SUBMITTALS

- A. Guarantee: Submit subcontractor's guarantee.
- B. Water Sterilization Test Report.

1.8 QUALITY ASSURANCE

- A. Contractor / Installer shall have been in business for five (5) years providing/finishing similar size projects and complexity.
- B. Contractor shall be solely responsible for all subgrades built. Any repairs resulting from inadequate compaction or incorrect grades will be the responsibility of the contractor.
- C. The representatives of the Owner's testing lab will not act as supervisor of construction, nor will they direct construction operations. Neither the presence of the Owner's testing lab representatives nor the testing by the Owner's testing lab shall excuse the contractors or subcontractors for defects or deficiencies discovered in their work during or following completion of the project. Correcting inadequate compaction is the sole responsibility of the contractor.
- D. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the drawings to be salvaged and re-used.
 - 1. Sun damaged or discolored PVC pipe will be rejected.
- E. All materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.

1.9 FEES, PERMITS, AND UTILITY SERVICES

- A. Obtain and pay for permits and service charges required for installation of Work. Arrange for required inspections and secure written approvals from authorities having jurisdiction.
- B. Upon completion of work within right-of-way, provide copies of written final approval to the Architect.

1.10 DELIVERY, STORAGE AND HANDLING

- A. Transport, store and handle in strict accord with the local jurisdiction and manufacturer's written recommendations
- B. Deliver undamaged products to job in manufacturer's sealed containers and/or original bundles with tags and labels intact.

1.11 EXISTING SITE CONDITIONS

- A. Contractor shall acquaint himself with all site conditions. If unknown active utilities are encountered during work, notify Architect promptly for instructions. Failure to notify will make Contractor liable for damage to these utilities arising from Contractor's operations subsequent to discovery of such unknown active utilities.
- B. Existing civil, mechanical and electrical improvements are shown on respective site plans to the extent known. Should the Contractor encounter any deviation between actual conditions and those shown, he is to immediately notify the Architect before continuing work.

1.12 PROTECTION

- A. Adequate protection measures shall be provided to protect workmen and passers-by on and off the site. Adjacent property shall be fully protected throughout the operations. Blasting will not be permitted. Prevent damage to adjoining improvements and properties both above and below grade. Restore such improvements to original condition should damage occur. Replace trees and shrubs outside building area disturbed by operations.
- B. In accordance with generally accepted construction practices, the Contractor shall be solely and completely responsible for working conditions at the job site, including safety of all persons and property during performance of the work. This requirement shall apply continuously and shall not be limited to normal working hours.
- C. Any construction review of the Contractor's performance conducted by the Geotechnical Engineer is not intended to include review of the adequacy of the Contractor's safety measures, in, on, or near the construction site.
- D. Provide shoring, sheeting, sheet piles and or bracing to prevent caving, erosion or gulying of sides of excavation.
- E. Surface Drainage: Provide for surface drainage during period of construction in manner to avoid creating nuisance to adjacent areas. The contractor shall make a reasonable effort on a daily basis to provide pumps and all equipment necessary to keep all excavations and the site free from water during entire progress of work, regardless of cause, source, or nature of water.
- F. Adjacent streets and sidewalks shall be kept free of mud, dirt or similar nuisances resulting from earthwork operations.
- G. The site and adjacent influenced areas shall be watered as required to suppress dust nuisance. Dust control measures shall be in accordance with the local jurisdiction.
- H. Trees: Carefully protect existing trees that are to remain. Provide temporary irrigation as necessary to maintain health of trees.

1.13 SEASONAL LIMITS

- A. No fill material shall be placed, spread or rolled during unfavorable weather conditions. When work is interrupted by rains, fill operations shall not be resumed until field tests indicate that moisture content and density of fill are satisfactory.

1.14 RECORD DRAWINGS

- A. Keep a daily record of all pipe placed in ground, verified by Project Inspector.
- B. Upon completion of this Contract, furnish one tracing showing all outside utility lines, piping, etc., installed under this Contract. Locate and dimension all work with reference to permanent landmarks.
- C. All symbols and designations used in preparing "RECORD" drawings shall match those used in Contract drawings.
- D. Properly identify on as-builts and provide dimensions for all stubs for future connections. Provide concrete markers 6" dia. 12" deep, flush with finish grade at the ends of all stubbed pipes.
- E. Provide record drawings per Section 01 3300.

PART 2 - PRODUCTS

2.1 DESIGN AND PERFORMANCE CRITERIA

- A. Sustainable Design:
 - 1. VOC emissions for field-applied adhesives, sealants, and sealant primers must comply with limits specified in Section 01 6116.
 - 2. VOC emissions for field-applied paints and coatings must comply with limits specified in Section 01 6116.

2.2 MATERIALS - GENERAL

- A. Provide each item listed herein or shown on drawings of quality noted or approved equal. All material shall be new, full weight, standard in all respects and in first-class condition. Insofar as possible, all materials used shall be of same brand or manufacture throughout for each class of material or equipment. Materials shall be of domestic manufacture and shall be tested within Continental United States.
- B. Grade or quality of materials desired is indicated by trade names or catalog numbers stated herein.
- C. Dimensions, sizes, and capacities shown are minimum and shall not be changed without permission of Architect.
- D. All materials in this section used for any public water system or domestic water for human consumption shall be lead free.

1. For the purposes of this section, "lead free" means not more than 0.2 percent lead when used with respect to solder and flux and not more than 8 percent when used with respect to pipes and pipe fittings.
2. All pipe, pipe or plumbing fitting or fixtures, solder, or flux shall be certified by an independent American National Standards Institute (ANSI) accredited third party, including, but not limited to, NSF International, as being in compliance with this section.

E. All materials used for fire system piping shall be UL and FM approved.

2.3 VALVE BOXES

- A. Provide at each valve or cock in ground a Christy, Brooks, or equal to Christy G05CT, concrete valve box with cover marked for service, domestic water shall be marked "Water" and fire supply shall be marked "Fire". Furnish extension handles for each size square nut valve, and provide "fork" handle for each size of "wheel handle" valve as required. Do not locate valve boxes in walk, or covered passages, curbs, or curb & gutters, unless necessary. If valve location is within concrete or asphalt paved surface valve box shall be as detailed on plans for such condition. Provide valve box extensions as required to set bottom of valve box to bottom of piping in which valve is installed. Provide Owner with set of special wrenches and/or tools as required for operation of valves.

2.4 PIPES AND FITTINGS

- A. Sanitary Sewer: PVC sewer pipe and fittings with Ring-Tite joints, ASTM D3034 SDR35.
- B. Domestic water Lines 3 1/2" and smaller: Type K copper tubing, hard temper, with wrought copper fittings. Schedule 80 PVC, ASTM D 1784, ASTM D 1785.
- C. Water lines 4" and larger: AWWA C-900 Class 150/DR18 with rubber gasket joints.
- D. Fire lines 4" and larger: AWWA C-900 Class 200/DR14 with rubber gasket joints.
- E. Solder: Lead Free. 95/5; 95% Tin / 5% Antimony.
- F. Ductile Iron Pipe; AWWA Class 51, Cement Lined
- G. Ductile Iron Pipe Fittings; AWWA C110, C153, Ebba Iron, Star Romac, Sigma, or approved equal.
- H. PVC Mechanical Fittings; Ebba Iron, Star; Romac; Sigma or approved equal.
- I. Ductile Iron Pipe/PVC C-900 Pipe Restrained Fittings; Ebba Iron # 3800 Mega Coupling, Ebba Iron 1100CH Split Restrained Harness for pipe couplings. StarGrip Series 4000.
- J. Ductile Iron Pipe/PVC C900, C905 Restrained Degreedand Blind Cap Fittings,;
- K. Mega Lug; Sigma; Romac; or an approved equal

- L. Mechanical Fitting Bolts; Bolts and nuts shall be carbon steel with a minimum 60,000 psi tensile strength conforming to ASTM A 307, Grade A. Bolts shall be standard ANSI B1.1 Class 2A course threads. Nuts shall conform to ASTM A 563 and be standard ANSI B1.1, Class 2A course thread. All bolts and nuts shall be zinc coated.
- M. Fasteners Anti-Rust Coatings; After assembly, coat all fasteners with an Asphaltic Bituminous coatings conforming to latest edition NFPA 24.
- N. Ductile Iron Pipe Wrap; 8 mil polyethylene pipe wrap conforming to ANSI/AWWA C105/A21.5 standards.
- O. Pipe Insulation; Pipe exposed to atmospheric conditions ½" thru 4" NPT; Johns Manville rigid fiberglass insulation, Micro Lok HP; Owens Corning Fiberglas SSL II; Conforming to ASTM C 612, Type 1A or type 1B.
- P. Aluminum field applied pipe insulation jacket; comply with ASTM B209, ASTM C1729, ASTM C1371 Manufacturers; Childers Metals; ITW Insulation Systems Aluminum Jacketing; or an approved equal.
 - 1. Finish shall be flat mill finish
 - 2. Factory Fabricated Fitting Covers; 45 and 90 degree elbows, tee's, valve covers, end caps, unions, shall be of the same thickness and finish of jacket.
 - 3. The fittings shall be composed of 2-pieces
 - 4. Adhesives; per the manufacturers requirements
 - 5. Joint Sealant; shall be silicone, and shall be aluminum in color.
- Q. Sewer Forced Main; HDPE, DR 11, color gray with green stripe by JM Eagle or approved equal.

2.5 SANITARY SEWER MANHOLES

- A. Shall be constructed as shown on plan details.

2.6 CLEANOUTS

- A. Cleanouts of same diameter as pipe up to 8" in size shall be installed in all horizontal soil and waste lines where indicated and at all points of change in direction. Cleanouts shall be located not less than 18" from building so as to provide sufficient space for rodding. No horizontal run over 100 feet shall be without cleanout whether shown on drawings or not.
- B. All cleanout boxes shall be traffic rated with labeled lid, Christy G05CT or approved equal. Lid shall be vandal proof with stainless steel screws

2.7 UNIONS

- A. Furnish and install one union at each threaded or soldered connection to equipment and 2 unions, one on each side of valves on pipes ½" to 3".

- B. Locate unions so that piping can be easily disconnected for removal of equipment or valve. Provide type specified in following schedule:

Type of Pipe Union

Steel Pipe: 150 lb. Screwed malleable ground joint, brass, brass-to-iron seat, black or galvanized to match pipe.

Copper tubing: Brass ground joint with sweat connections.

PVC Sch 80 pipe: PVC union, FIPT X FIPT

2.8 VALVES

- A. Provide valves as shown and other valves necessary to segregate branches or units. Furnish valves suitable for service intended. Valves shall be properly packed and lubricated. Valves shall be non-rising stem. Place unions adjacent to each threaded or sweat fitting valve. Install valves with bonnets vertical. All valves shall be lead free.
- B. Valves ½" thru 2"; shall be made of bronze, full size of pipe and lead free. Nibco S-113-FL Series; American G-300 Series; Matco 511 FL Series; Apollo 102T-FL Series. Brass valves of brass parts within valves will not be accepted.
- C. Valves, 2 ½" thru 3" shall be class 150; Shall be made of bronze, full size of pipe; Jenkins Fig. 2310 J; Lunkinheimer Fig. 2153; Crane Fig. 437; Stockham Fig. B-128.
- D. Valves, Flanged; 4" thru 12" Ductile Iron Resilient Wedge Gate Valve; Nibco F 609 RW; American 2500 Series; Kennedy 8561; Mueller 2360 Series.

2.9 TAPPING SLEEVE

- A. Shall be used on pipe sizes 6" thru 12" and shall be made with stainless steel material including stainless steel bolts. Flanges shall be ductile iron or high carbon steel. Gaskets shall seal full circumference of pipe. Shall be manufactured for operating pressure of 200 psi, and shall pass test pressure of 300 psi. Romac SST series; Smithblair 662; Mueller H304; Ford "FAST" tapping sleeve.

2.10 SERVICE SADDLES

- A. Shall be used on pipe size 2" thru 4". Body shall be made from ductile iron with epoxy coating or bronze. Cascade Style CSC-1; A.Y. McDonald model 3891 AWWA/3892 FNPT; Smith-Blair #317; Ford S70, S71, S90, (style B).

2.11 TRACER WIRE

- A. No. 10 THW solid copper wire. Solder all joints

PART 3 - EXECUTION

3.1 DRAWINGS AND COORDINATION

- A. General arrangement and location of piping, etc., are shown on Drawings or herein specified. Install work in accord therewith, except for minor changes that may be necessary on account of other work or existing conditions. Before excavation, carefully examine other work that may conflict with this work. Install this work in harmony with other craft and at proper time to avoid delay of work.
- B. Verify invert elevations at points of connection to existing systems prior to any excavation. If invert elevations differ from that shown on drawings, notify Architect immediately.
- C. In advance of construction, work out minor changes if conflicts occur with electrical or mechanical. Relocate services to suit actual conditions and work of other trades to avoid conflict therewith. Any adjustments or additional fittings to make adjustments shall not be cause for additional costs to the owner.
- D. Execute any work or apparatus shown on drawings and not mentioned in specifications, or vice versa. Omission from Drawings or Specifications of any minor details of construction, installation, materials, or essential specialties does not relieve Contractor of furnishing same in place complete.
- E. Graded pipes shall take precedence. If conflict should occur while placing the domestic water and fire service piping, the contractor shall provide any and all fittings necessary to route the water lines over such conflicting pipes at no additional costs to the owner.

3.2 ACCESS

- A. Continuously check for clearance and accessibility of equipment or materials specified herein to be placed. No allowance of any kind shall be made for negligence on part of Contractor to foresee means of installing his equipment or materials into proper position.

3.3 EXCAVATING AND BACKFILLING

- A. Excavation and Bedding:
 - 1. General: Trench straight and true to line and grade with bottom smooth and free of irregularities or rock points. Trench width to be a minimum of 12" wider than outside diameter of pipe. Follow manufacturer's recommendations for use of each kind and type of pipe.
 - 2. Bedding: Provide a bedding as noted on drawing details for the full length of the pipe. Bedding shall have a minimum thickness beneath the pipe of 4" or 1/8 the outside diameter of the pipe, which ever is greater. Provide bell holes and depressions for pipe joints only of size required to properly make joint.
 - 3. If the trenches for the site utilities falls within areas to be lime treated, the piping shall be installed prior to any lime treatment operations, providing the elevation of the piping is below the treatment section.

UTILITIES
SECTION 33 0000
3595001

- a. If trenching is necessary in areas that have been previously lime treated the contractor shall backfill the trench with class 2 aggregate base, with minimum section equal to the lime treated section and compacted to 95%.

B. Laying of Pipe:

- 1. General: Inspect pipe prior to placing. Sun damaged pipe will be rejected. Set aside any defective or damaged material. Do not place pipe in water nor place pipe when trenches or weather are unsuitable. Lay pipe bell up grade, true to line and grade.
 - a. Sewer pipe shall be laid in strict conformity to the prescribed line and grade, with grade bars set and each pipe length checked to the grade line. Three consecutive points on the same rate of slope shall be used at all times to detect any variation from a straight grade. In any case of discrepancy, work shall be stopped and the discrepancy immediately reported to the Owner's Representatives. In addition, when requested by the Owner's Representative, a string line shall be used in the bottom of the trench to insure a straight alignment of the sewer pipe between manholes. The maximum deviation from grade shall not be in excess of 1/4 inch. In returning the pipe to grade, no more than 1/4" depression shall result.
 - b. The Contractor shall expose the end of existing pipe to be extended, for verification of alignment and elevation, prior to trenching for any pipe which may be affected. All costs of such excavation and backfill shall be included in the price paid for the various items of work.
 - c. A temporary plug, mechanical type shall be installed on sewer pipe at the point of connection to existing facilities. If connecting to a public facility the plug shall conform to the requirements of the local jurisdiction. This plug shall remain in place until the completion of the balling and flushing operation.
- 2. Bell and Spigot Joints: Lubricate inside of bells and outside of spigots with soap solution. Wedge joints tight. Bell of bell and spigot pipe to be pointed up grade.

C. Backfilling:

- 1. General: Do not start backfill operations until required testing has been accomplished.
- 2. Compaction and Grading: Remainder of backfill shall be in accordance with Section 31 2333 – TRENCHING AND BACKFILLING.
- 3. If trenching in area previously lime or cement treated backfill top of trench section, same depth as lime or cement treatment with Class 2 Aggregate Base compacted to 95% minimum relative compaction.

3.4 INSTALLATION OF WATER PIPING

- A. Immediately cap or plug ends of, and opening in, pipe and fittings to exclude dirt until final connections made. Use reducing fittings where any change in pipe size occurs. Bushings shall not be used.

- B. General: Should existing conditions or other work prevent the running of pipes or the setting of equipment at the points indicated by drawings, changes as authorized by the Architect shall be made without additional cost to the Owner.
- C. All bolts used on mechanical fittings shall be thoroughly coated with an asphaltic bituminous coating conforming to 2007 NFPA (National Fire Protection Association) 10.3.5.2 and 10.8.3.5, CBC chapter 35 and CFC chapter 80.
- D. All buried metal shall be incased with 8 mil polyethylene wrap so that no soil is in contact with metal. Ends of polyethylene wrap shall be taped to provide seal with pipe.
- E. Do not install water lines in same trench with non-metallic sewer lines unless bottom of water pipe at all points is at least 12" above top of sewer line and water line is placed on solid shelf excavated at one side of common trench with a minimum of 12 inch horizontal separation.
- F. Under no circumstance shall a fitting be located directly under a structural footing without prior approval from the Architect.
- G. In locations where existing domestic pipe is rerouted, the new pipe shall be assembled using restrained fittings at all joints including factory pipe joints. Tapped restrained blind flanges shall be temporarily installed at each end of the assembled pipes until testing and chlorination is completed and approved.

3.5 CLOSING IN OF UNINSPECTED WORK

- A. Do not allow or cause work installed to be covered up or enclosed before it has been inspected, tested, and approved. Should work be enclosed or covered up before it has been approved, uncover work at own expense. After it has been inspected, tested and approved, make repairs necessary to restore work of other contractors to condition in which it was found at time of cutting.

3.6 CARE AND CLEANING

- A. Repair or replace broken, damaged, or otherwise defective parts, materials, and work. Leave entire work in new condition satisfactory to Architect. At completion, carefully clean and adjust equipment, fixtures and trim that are installed as part of this work. Leave systems and equipment in satisfactory new operating condition.
- B. Drain and flush piping to remove grease and foreign matter.
- C. Sewer piping shall be balled and flushed.
- D. Clean out and remove surplus materials and debris resulting from the work, including surplus excavated material.
- E. Flush fire service piping in the presence of the project inspector. Flushing shall be continued for a sufficient time as necessary to ensure all foreign material has been removed. Flow rate shall be equal to site fire flow requirements.

3.7 SEWER INTERNAL INSPECTIONS

- A. Upon completion of construction and prior to final inspection, the Contractor shall clean the entire new pipeline of all dirt and debris. Any dirt or debris in previously existing pipes or ditches in the area, which resulted from the new installation, shall also be removed. Pipes shall be cleaned by the controlled balling and flushing method. Temporary plugs shall be installed and maintained during cleaning operations at points of connection to existing facilities to prevent water, dirt, and debris from entering the existing facility.

3.8 TEST OF PIPING

- A. Pressure Test piping at completion of roughing-in, in accord with following schedule, and show no loss in pressure or visible leaks after minimum duration or four (4) hours at test pressures indicated.
- B. Chlorination tests shall be performed after all fixtures and any required mechanical devices are installed and the entire system is complete and closed up.
- C. In cases where new domestic water piping is assembled for re-routing of existing domestic water pipe, the contractor shall perform the following testing prior to connecting the new water pipe to the existing system.
 - 1. The pipe shall be pressure tested and per the test schedule.
 - 2. The pipe shall be pressure tested down within the trench.
 - 3. The contractor shall dig a temporary ditch below the existing pipe to drain to a sump that is lower than the bottom of the trench and to the side of the trench. The sump shall be 30% larger than the total volume of water within the testing pipe assembly.
 - 4. After pressure testing and chlorination has taken place and accepted, the contractor shall drain the pipe into the sump and pump the sump out as it is filling.
 - 5. The temporary test fittings at each end of the pipe assembly shall be removed and the final restrained couplings installed.
 - 6. The existing piping shall be cut and the water within the pipe shall drain below the pipe to the temporary sump. Pump the sump as it is being filled up. Take extreme caution not to contaminate the existing pipe with any contaminants within the trench.
 - 7. Before making the final coupling connections, the restrained couplings at each end of the new pipe shall be thoroughly swabbed inside the fitting with a solution of chlorine mixed with water at a rate of 1 part chlorine to 4 parts potable water.
 - 8. After final connections are made, a visual inspection shall be made after fittings are wiped off. If after 1 hr, no noticeable drips are noted the pipe can be backfilled.
 - 9. The contractor shall flush all water piping affected by chlorination until it is within acceptable levels approved by certified testing lab.

TEST SCHEDULE

<u>System Tested</u>	<u>Test Pressure PSIG Test With</u>
Public Water Mains	Per local jurisdiction requirements.
Private Domestic Water Piping:	150 Lbs. Water 4 hrs.
Fire Protection Piping:	200 Lbs. Water pressure, 4 hrs duration with no pressure loss.
Sanitary Sewer Piping:	Sewer system shall be tested for leakage per local jurisdiction requirements.

- D. Testing equipment, materials, and labor shall be furnished by contractor.

3.9 WATER SYSTEM STERILIZATION

- A. Public Water Mains: Shall be flushed and disinfected per the local jurisdiction requirements
- B. Clean and disinfect all site water systems connected to the domestic water systems in accordance with AWWA Standard C651 and as required by the local Building and Health Department Codes, and EPA.
 - 1. Clean and disinfect industrial water system in addition to the domestic water system.
 - 2. Disinfect existing piping systems as required to provide continuous disinfection upstream to existing valves. At Contractors option, valves may be provided to isolate the existing piping system from the new piping system.
- C. Domestic water sterilization shall be performed by a licensed "qualified applicator" as required by CAL-EPA Pesticide Enforcement Branch for disinfecting and sterilizing drinking water.
- D. Disinfecting Agent: Chlorine product that is a registered product with Cal-EPA for use in California potable water lines, such as Bacticide, CAL-EPA Registration No. 37982-20001.
- E. Contractor to provide a 1" service valve connected to the system at a point within 2'-0" of its junction with the water supply line. After sterilization is complete Contractor to provide cap at valve.
- F. Sterilization Procedure to be as follows:
 - 1. Flush pipe system by opening all outlets and letting water flow through the system until clear water flows from all outlets.

UTILITIES
SECTION 33 0000
3595001

2. Inject disinfecting agent to provide a minimum chlorine residual concentration of at least 50 parts per million (ppm) of free chlorine at each outlet.
 3. Provide sign at all outlets which reads "Water Sterilization in Progress – Do not operate". Remove signs at conclusion of test.
 4. Close all outlets and valves, including valve connecting to water supply line and 1" service valve. Retain treated water in pipe for a minimum of twenty-four hours. Should chlorine residual at pipe extremities be less than 50 PPM at this time, pipe shall be re-chlorinated. As an option, the water systems may be filled with a water-chlorine solution containing a minimum of 200 PPM of chlorine and allowed to stand for three hours.
 5. After chlorination, flush lines of chlorinated water and refill from domestic supply. Continue flushing until residual chlorine is less than or equal to 0.2 ppm, or a residual the same as that of the test water.
- G. Chemical and bacteriological tests shall be conducted by a state-certified laboratory and approved by the local authorities having jurisdiction.
- H. Submit written report to Health Department as required by State Regulations. Provide a copy of report to Architect prior to completion of project.
- I. The costs of sterilization and laboratory testing shall be paid for by the contractor.

3.10 CLEANING

- A. Upon completion of work of this Section promptly remove from the working area all scraps, debris and surplus material of this Section.

END OF SECTION

s:\master specifications\division 33 - utilities\33 0000_utilities.docx
Formatting Updated: 9-13-21

PART 1 - GENERAL

1.1 SUMMARY

- A. Summary Includes:
 - 1. Storm drainage piping systems.

1.2 RELATED REQUIREMENTS

- A. Section 01 5000, Construction Facilities and Controls.
- B. Section 01 6116, Volatile Organic Compound (VOC) Restrictions, for VOC limits pertaining to adhesives, sealants, fillers, primers, and coatings.
- C. Section 01 8113, Sustainable Design Requirements, for CAL-Green **[and Collaborative for High Performance Schools (CHPS)]** general requirements and procedures.
- D. Section 31 0000, Earthwork.
- E. Section 31 2333, Trenching and Backfilling.
- F. Section 32 1200, Asphalt Concrete Paving.
- G. Section 32 1600, Site Concrete

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CAL Green), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- C. California Plumbing Code, (CPC), edition as noted on the Drawings.
- D. Local Jurisdiction: Any work within the street, highway or right-of-way shall be performed in accordance with the requirement of the governmental agencies having jurisdiction, and shall not begin until all of those governing authorities have been notified.
- E. ASTM International (ASTM):
 - 1. D 422-63 Test Method for Particle Size Analysis of Soil.
 - 2. D698-00 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures, Using 5.5 lb (2.49 Kg) Rammer and 12 inch (304.8 mm) Drop.
 - 3. D1556-00 - Test Method for Density of Soil in Place by the Sand-Cone Method.
 - 4. D1557-02 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 10 lb. (4.54 Kg) Rammer and 18 inch (457 mm) Drop.

STORM DRAINAGE UTILITIES
SECTION 33 4000
3595001

5. D 3017-05 Test Methods for Moisture Content of Soils and Soil-Aggregate Mixture by Nuclear Methods (Shallow Depth).
6. D 4318-05 Test Method for Liquid Limit, Plastic Limit, and Plasticity Limit.

F. CALTRANS Standard Specifications.

G. CAL-OSHA, Title 8, Section 1590 (e).

1.4 ADMINISTRATIVE REQUIREMENTS

A. Submittal Procedures:

1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
3. Sustainable Design Submittals shall comply with the additional requirements of Section 01 8113, Sustainable Design Requirements.

1.5 ACTION SUBMITTALS

- A. Provide supplier's descriptive literature for all products to demonstrate compliance with specified attributes.
- B. Substitution: Provide all data of proposed material being submitted as a substitution. Provide comparison with specified product data and identify all differences. Failure to provide comparison will be reason for rejection.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: Contractor / installer.
- B. Provide sieve analysis from accredited testing lab on pipe bedding material. Analysis shall have a current date not older than project contract signing date.
- C. Sustainable Design:
1. General:
 - a. Submit information necessary to establish and document compliance with the California Green Building Standards Code.
 - b. Sustainable design submittals are in addition to other submittals.
 2. The following information shall be provided:
 - a. Adhesives and Sealants: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.
 - b. Paints and Coatings: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.

1.7 CLOSEOUT SUBMITTALS

- A. Guarantee: Submit subcontractor's guarantee.

1.8 QUALITY ASSURANCE

- A. Contractor / Installer shall have been in business for five (5) years providing/finishing similar size projects and complexity.
- B. Contractor shall be solely responsible for all subgrades built. Any repairs resulting from inadequate compaction are the responsibility of the contractor.
- C. The representatives of the Owner's testing lab will not act as supervisor of construction, nor will they direct construction operations. Neither the presence of the Owner's testing lab representatives nor the testing by the Owner's testing lab shall excuse the contractors or subcontractors for defects discovered in their work during or following completion of the project. Correcting inadequate compaction is the sole responsibility of the contractor.
- D. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.
 - 1. Sun damaged or discolored PVC pipe will be rejected.
- E. All materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.

1.9 DELIVERY, STORAGE AND HANDLING

- A. Transport, store and handle in strict accord with the local jurisdiction and manufacturer's written recommendations
- B. Deliver undamaged products to job in manufacturer's sealed containers and/or original bundles with tags and labels intact.

1.10 EXISTING SITE CONDITIONS

- A. Contractor shall acquaint himself with all site conditions. If unknown active utilities are encountered during work, notify Architect promptly for instructions. Failure to notify will make Contractor liable for damage to these utilities arising from Contractor's operations subsequent to discovery of such unknown active utilities.
- B. Existing civil, mechanical and electrical improvements are shown on respective site plans to the extent known. Should the Contractor encounter any deviation between actual conditions and those shown, he is to immediately notify the Architect before continuing work.

1.11 PROTECTION

- A. Adequate protection measures shall be provided to protect workmen and passers-by on and off the site. Adjacent property shall be fully protected throughout the operations.

STORM DRAINAGE UTILITIES
SECTION 33 4000
3595001

Blasting will not be permitted. Prevent damage to adjoining improvements and properties both above and below grade. Restore such improvements to original condition should damage occur. Replace trees and shrubs outside building area disturbed by operations.

- B. In accordance with generally accepted construction practices, the Contractor shall be solely and completely responsible for working conditions at the job site, including safety of all persons and property during performance of the work. This requirement shall apply continuously and shall not be limited to normal working hours.
- C. Any construction review of the Contractor's performance conducted by the Geotechnical Engineer is not intended to include review of the adequacy of the Contractor's safety measures, in, on, or near the construction site.
- D. Provide shoring, sheeting, sheet piles and/or bracing to prevent caving, erosion or gullyng of sides of excavation.
- E. Surface Drainage: Provide for surface drainage during period of construction in manner to avoid creating nuisance to adjacent areas. The contractor shall make a reasonable effort on a daily basis to provide pumps and all equipment necessary to keep all excavations and the site free from water during entire progress of work, regardless of cause, source, or nature of water.
- F. Adjacent streets and sidewalks shall be kept free of mud, dirt or similar nuisances resulting from earthwork operations.
- G. The site and adjacent influenced areas shall be watered as required to suppress dust nuisance. Dust control measures shall be in accordance with the local jurisdiction.
- H. Trees: Carefully protect existing trees that are to remain.

1.12 SEASONAL LIMITS

- A. No fill material shall be placed, spread or rolled during unfavorable weather conditions. When work is interrupted by rains, fill operations shall not be resumed until field tests indicate that moisture content and density of fill are satisfactory.

1.13 TESTING

- A. General: Refer to Section 01 4523 – Testing and Inspection Services, and Structural Tests and Inspections List, DSA-103.
- B. Geotechnical Engineer: Owner is retaining a Geotechnical Engineer to determine compliance of fill with Specifications, and to direct adjustments in fill operations. Costs of Geotechnical Engineer will be borne by Owner; except those costs incurred for re-tests or re-inspection will be paid by Owner and backcharged to Contractor.

1.14 RECORD DRAWINGS

- A. Keep a daily record of all pipe placed in ground, verified by Project Inspector.

STORM DRAINAGE UTILITIES
SECTION 33 4000
3595001

- B. Upon completion of this Contract, furnish one tracing showing all outside utility lines, piping, etc., installed under this Contract. Locate and dimension all work with reference to permanent landmarks.
- C. All symbols and designations used in preparing "RECORD" drawings shall match those used in Contract drawings.
- D. Properly identify all stubs for future connections, as to location and use, by setting of concrete marker at finished grade in the manner suitable to Architect.

PART 2 - PRODUCTS

2.1 DESIGN AND PERFORMANCE CRITERIA

- A. Sustainable Design:
 - 1. VOC emissions for field-applied adhesives, sealants, and sealant primers must comply with limits specified in Section 01 6116.
 - 2. VOC emissions for field-applied paints and coatings must comply with limits specified in Section 01 6116.

2.2 MATERIALS

- A. Pipe: Use one of the following, unless noted on the Drawings otherwise.
 - 1. Polyvinyl Chloride Pipe (PVC): SDR35 conforming to ASTM D3034 with elastomeric joints conforming to ASTM D3212 for pipe to 12". Sun damaged pipe will be rejected.
 - 2. High density polyethylene pipe (HDPE): The pipe shall be corrugated exterior/smooth interior pipe. 12" to 60" maximum diameter shall conform to AASHTO M294, water tight per ASTM D3212 with water tight gasket fittings.
- B. Perforated Pipe (for subdrains): Shall be ADS N12 pipe, 3 hole, ASTM F 405, AASHTO M 252; PCV ASTM D3034 SDR-35 storm drain pipe
- C. Manhole: Shall be as shown on the drawing details.
- D. Drop Inlet: Shall be as shown on the drawing details.
- E. Curb Inlet: Shall be as shown on the drawing details.
- F. Mortar: For pipe connections to concrete drainage structures, conform to ASTM C270 type N mortar. Place within one half hour after adding water.
- G. Crushed Rock: Imported washed crushed rock. Minimum 100% passing 3/4 inch sieve.
- H. Trench drain: Polycast, Polydrain or equal and as shown on drawings.
- I. Area Drains: Shall be as shown on the drawing details.

STORM DRAINAGE UTILITIES
SECTION 33 4000
3595001

- J. Floor Drains: Shall be as shown on the drawing details.
- K. Clean-outs: Shall be as shown on the drawing details.
- L. Planter drains: Shall be as detailed on the drawing details.
- M. Filter Fabric: Mirafi 140N.

PART 3 - EXECUTION

3.1 INSPECTION LAYOUT AND PREPARATION

- A. Prior to installation of the work of this Section, carefully inspect and verify by field measurements that installed work of all other trades is complete to the point where this installation may properly commence
- B. Layout all work, establish grades, locate existing underground utilities, set markers and stakes, setup and maintain barricades and protection facilities; all prior to beginning actual earthwork operations. Layout and staking shall be done by a licensed Land Surveyor or Professional Civil Engineer.
- C. Verify that specified items may be installed in accordance with the approved design.
- D. In event of discrepancy, immediately notify Owner and the Architect. Do not proceed in discrepant areas until discrepancies have been fully resolved.

3.2 EXCAVATION AND BACKFILLING

- A. General: Installation shall be in strict conformance with referenced standards, the manufacturer's written directions, as shown on the drawings and as herein specified.
- B. Verify invert elevations at points of connection to existing systems prior to any excavation. If invert elevations differ from that shown on drawings, notify Architect immediately.
- C. Excavation and Bedding:
 - 1. General: Trench straight and true to line and grade with bottom smooth and free of irregularities or rock points. Trench width in accordance with pipe manufacturer's recommendations and as per the drawings. Follow manufacturer's recommendations for use of each kind and type of pipe.
 - 2. Bedding: Provide bedding as detailed on plans for the full length of the pipe. Bedding shall have a minimum thickness beneath the pipe of 4" or 1/8 the outside diameter of the pipe, whichever is greater. Provide bell holes and depressions for pipe joints only of size required to properly make joint.
 - 3. If the trenches for the site drainage fall within areas to be lime treated, the piping shall be installed prior to any lime treatment operations.
 - a. If additional piping is added to previously lime treated areas, the contractor shall backfill the trench with class 2 aggregate base and compact to 95%.

D. Laying of Pipe:

1. General: Inspect pipe prior to placing. Set aside any defective or damaged material. Do not place pipe in water nor place pipe when trenches or weather are unsuitable. Lay pipe upgrade, true to line and grade.
2. Bell and Spigot Joints: Lubricate inside of bells and outside of spigots with soap solution or as recommended by manufacture. Wedge joints tight. Bell of bell and spigot pipe to be pointed upgrade.
3. Pipe shall be bedded uniformly throughout its length.
4. Pipe elevation shall be within 0.02 feet of design elevation as shown on plans.
5. Off Site Work: All work beyond the property lines shall be done in strict conformance with the requirements of the governing agency.

E. Backfilling:

1. General: Do not start backfill operations until required testing has been accomplished.
2. Trenches and Excavations: Backfill with material as detailed on plans, filling both sides of the pipe at the same time, carefully tamping to hold pipe in place without movement. Refer to Section 31 2333 – TRENCHING AND BACKFILLING for fill above this layer.

F. Grouting of Pipes: Grout pipes smooth and water tight at drop inlet, manholes, and curb inlets. Grout back side of hood at curb inlets all grouting shall be smooth and consistent.

G. Off Site Work: All work beyond the property lines shall be done in strict conformance with the requirements of the local agency.

H. Cutting and Patching: Remove and replace existing surface features per applicable specification section (i.e. asphaltic concrete or concrete paving) where pipe is installed in areas of existing improvements.

3.3 TOLERANCES

A. Storm Drain structure grates

1. In landscape and lawn areas $\pm 0.05'$.
2. In sidewalk and asphalt pavement $\pm 0.025'$.
3. In curb and gutter application $\pm 0.0125'$.

B. Cleanout Boxes and Lids

1. In landscape areas; 0.10 higher than surrounding finish grade, $\pm 0.05'$.
2. In sidewalks and asphalt pavement; Flush with surrounding finish grade, $\pm 0.025'$.

3.4 DEWATERING

A. Contractor to provide trench dewatering as necessary, no matter what the source is, at no additional cost to the owner.

STORM DRAINAGE UTILITIES
SECTION 33 4000
3595001

3.5 FLUSHING

- A. The Contractor shall thoroughly ball and flush the storm drain system to remove all dirt and debris. Discharge water to an approved location.

3.6 CLEANING

- A. Upon completion of work of this Section promptly remove from the working area all scraps, debris and surplus material of this Section.
- B. Clean the dirt, rocks, and debris from the drop inlets and storm drain manholes.

END OF SECTION

**McKinley Elementary School -
Shade Structures**

800 E. Carlton Way, Tracy, CA 95376

3595001

Tracy Unified School District
1875 W Lowell Ave., Tracy, CA 95376

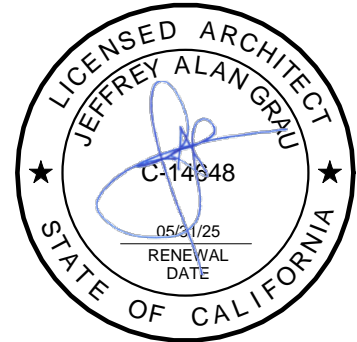


May 16, 2024

McKinley Elementary School - Shade Structures
Tracy Unified School District
Tracy, California

May 16, 2024

HMC # 3595001



HMC ARCHITECTS
Architect



Warren Consulting Engineers
Civil Engineer

TABLE OF CONTENTS

DIVISION 00 - PROCUREMENT AND CONTRACTING REQUIREMENTS - NOT USED

DIVISION 01 - GENERAL REQUIREMENTS

SECTION	01 1100 - Summary of Work
	01 2100 - Allowance
	01 2513 - Product Options and Substitutions
	01 2600 - Changes in the Work
	01 2900 - Application for Payment and Conditional and Unconditional Waiver and Release Forms
	01 3119 - Project Meetings
	01 3213 - Scheduling of Work
	01 3300 - Submittal (Including Submittal Transmittal, Substitution Request, RFI, Electronic Data Request, Certification of Compliance for Building Materials, Roof Certification)
	01 3513.23 - Site Standards
	01 3516 - Alteration Project Procedures
	01 3543 - Environmental Procedures
	01 4100 - Regulatory Requirements
	01 4213 - Abbreviations and Acronyms
	01 4216 - Definitions
	01 4219 - References
	01 4300 - Materials and Equipment
	01 4500 - Quality Control
	01 4516 - Field Quality Control Procedures
	01 4523 - Testing and Inspection Services
	01 5000 - Temporary Facilities and Controls
	01 5013 - Construction Waste Management and Disposal
	01 5213 - Field Offices
	01 5639 - Temporary Tree Protection
	01 5713.10 - Erosion Control
	01 6116.10 - Volatile Organic Compound (VOC) Restrictions
	01 6600 - Product Delivery Storage and Handling
	01 7123 - Field Engineering
	01 7329 - Cutting and Patching
	01 7419 - Construction Waste Management and Disposal
	01 7419A - Contractor's Construction Waste and Recycling Plan
	01 7419B - Contractor's Reuse, Recycling and Disposal Report
	01 7600 - Alteration Project Procedures
	01 7700 - Contract Closeout and Final Cleaning
	01 7823 - Operation and Maintenance Data
	01 7836 - Warranties (Including Contractor Standard Warranty Form, Subcontractor Standard Warranty Form, Special Extended Warranty Form)
	01 7839 - Record Documents
	01 8113.10 - Sustainable Design Requirements

DIVISION 02 - EXISTING CONDITIONS - NOT USED

DIVISION 03 - CONCRETE - NOT USED

DIVISION 04 - MASONRY - NOT USED

DIVISION 05 - METALS - NOT USED

DIVISION 06 - WOOD, PLASTICS, AND COMPOSITES - NOT USED

DIVISION 07 - THERMAL AND MOISTURE PROTECTION - NOT USED

TABLE OF CONTENTS

DIVISION 08 - OPENINGS - NOT USED

DIVISION 09 - FINISHES - NOT USED

DIVISION 10 - SPECIALTIES - NOT USED

DIVISION 11 - EQUIPMENT - NOT USED

DIVISION 12 - FURNISHINGS - NOT USED

DIVISION 13 - SPECIAL CONSTRUCTION - NOT USED

DIVISION 14 - CONVEYING EQUIPMENT - NOT USED

DIVISION 21 - FIRE SUPPRESSION - NOT USED

DIVISION 22 - PLUMBING - NOT USED

DIVISION 23 - HEATING, VENTILATING AND AIR CONDITIONING (HVAC) - NOT USED

DIVISION 26 - ELECTRICAL - NOT USED

DIVISION 27 - COMMUNICATIONS - NOT USED

DIVISION 28 - ELECTRONIC SAFETY AND SECURITY - NOT USED

DIVISION 31 - EARTHWORK

SECTION 31 0000 - Earthwork
 31 2333 - Trenching and Backfilling

DIVISION 32 - EXTERIOR IMPROVEMENTS

SECTION 32 1200 - Asphalt Concrete Paving
 32 1600 - Site Concrete
 32 1816.13 - Playground Protective Surfaces
 32 1816.16 - Synthetic Turf

DIVISION 33 - UTILITIES

SECTION 33 0000 - Utilities
 33 4000 - Storm Drainage Utilities

SUMMARY OF WORK

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Site Access Conditions and Requirements;
- B. Special Conditions.

1.02 SUMMARY OF WORK COVERED BY CONTRACT DOCUMENTS

- A. The Work of this Contract consists of the following at Wanda Hirsch Elementary School:
 - (1) Construction and installation of 2 - 30'x40' Four Post Hip PC shade structure, 1 - 30'x60' Joined Hip PC shade structure, 1 - play apparatus with poured in place rubber surfacing, and related civil and landscape upgrades.

1.03 CONTRACTS

- A. Perform the Work under a single, fixed-price Contract.

1.04 WORK BY OTHERS

- A. Fabrication of the shade structures and play apparatus.

1.05 CODES, REGULATIONS, AND STANDARDS

- A. The codes, regulations, and standards adopted by the state and federal agencies having jurisdiction shall govern minimum requirements for this Project. Where codes, regulations, and standards conflict with the Contract Documents, these conflicts shall be brought to the immediate attention of the District and the Architect.
- B. Codes, regulations, and standards shall be as published effective as of date of bid opening, unless otherwise specified or indicated.

1.06 PROJECT RECORD DOCUMENTS

- A. Contractor shall maintain on Site one set of the following record documents; Contractor shall record actual revisions to the Work:
 - (1) Contract Drawings.

- (2) Specifications.
 - (3) Addenda.
 - (4) Change Orders and other modifications to the Contract.
 - (5) Reviewed shop drawings, product data, and samples.
 - (6) Field test records.
 - (7) Inspection certificates.
 - (8) Manufacturer's certificates.
- B. Contractor shall store Record Documents separate from documents used for construction. Provide files, racks, and secure storage for Record Documents and samples.
 - C. Contractor shall record information concurrent with construction progress.
 - D. Specifications: Contractor shall legibly mark and record at each product section of the Specifications the description of the actual product(s) installed, including the following:
 - (1) Manufacturer's name and product model and number.
 - (2) Product substitutions or alternates utilized.
 - (3) Changes made by Addenda and Change Orders and written directives.

1.07 EXAMINATION OF EXISTING CONDITIONS

- A. Contractor shall be held to have examined the Project Site and acquainted itself with the conditions of the Site and of the streets or roads approaching the Site.
- B. Prior to commencement of Work, Contractor shall survey the Site and existing buildings and improvements to observe existing damage and defects such as cracks, sags, broken, missing or damaged glazing, other building elements and Site improvements, and other damage.
- C. Should Contractor observe cracks, sags, and other damage to and defects of the Site and adjacent buildings, paving, and other items not indicated in the Contract Documents, Contractor shall immediately report same to the District and the Architect.

1.08 CONTRACTOR'S USE OF PREMISES

- A. If unoccupied and only with District's prior written approval, Contractor may use the building(s) at the Project Site without limitation for its operations, storage, and office facilities for the performance of the Work. If the District chooses to beneficially occupy any building(s), Contractor must obtain the District's written approval for Contractor's use of spaces and types of

operations to be performed within the building(s) while so occupied. Contractor's access to the building(s) shall be limited to the areas indicated.

- B. If the space at the Project Site is not sufficient for Contractor's operations, storage, office facilities and/or parking, Contractor shall arrange and pay for any additional facilities needed by Contractor.
- C. Contractor shall not interfere with use of or access to occupied portions of the building(s) or adjacent property.
- D. Contractor shall maintain corridors, stairs, halls, and other exit-ways of building clear and free of debris and obstructions at all times.
- E. No one other than those directly involved in the demolition and construction, or specifically designated by the District or the Architect shall be permitted in the areas of work during demolition and construction activities.
- F. The Contractor shall install the construction fence and maintain that it will be locked when not in use. Keys to this fencing will be provided to the District.

1.09 PROTECTION OF EXISTING STRUCTURES AND UTILITIES

- A. The Drawings show above-grade and below-grade structures, utility lines, and other installations that are known or believed to exist in the area of the Work. Contractor shall locate these existing installations before proceeding with excavation and other operations that could damage same; maintain them in service, where appropriate; and repair damage to them caused by the performance of the Work. Should damage occur to these existing installations, the costs of repair shall be at the Contractor's expense and made to the District's satisfaction.
- B. Contractor shall be alert to the possibility of the existence of additional structures and utilities. If Contractor encounters additional structures and utilities, Contractor will immediately report to the District for disposition of same as indicated in the General Conditions.

1.10 UTILITY SHUTDOWNS AND INTERRUPTIONS

- A. Contractor shall give the District a minimum of three (3) days written notice in advance of any need to shut off existing utility services or to effect equipment interruptions. The District will set exact time and duration for shutdown, and will assist Contractor with shutdown. Work required to re-establish utility services shall be performed by the Contractor.
- B. Contractor shall obtain District's written approval as indicated in the General Conditions in advance of deliveries of material or equipment or other activities that may conflict with District's use of the building(s) or adjacent facilities.

1.11 STRUCTURAL INTEGRITY

- A. Contractor shall be responsible for and supervise each operation and work that could affect structural integrity of various building elements, both permanent and temporary.

- B. Contractor shall include structural connections and fastenings as indicated or required for complete performance of the Work.

PART 2 – PRODUCTS Not Used.

PART 3 – EXECUTION Not Used.

END OF DOCUMENT

ALLOWANCE

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Non-specified work.

1.2 RELATED SECTIONS

A. Document 01 10 00 (Summary of Work)

B. Document 01 29 00 (Application for Payment)

C. Document 01 33 00 (Submittal Procedures)

1.3 ALLOWANCES

- A. Included in the Contract, a stipulated sum/price of **[INSERT AMOUNT]** as an allowance for DSA Revisions within the limits set forth in the Contract Documents. This Allowance shall not be utilized without written approval by the District.
- B. Contractor's costs, without overhead and profit, for products, delivery, installation, labor, insurance, payroll, taxes, bonding and equipment rental will be included in Allowance Expenditure Directive authorizing expenditure of funds from this Allowance. No overhead and profit shall be added to the Allowance Expenditure Directive.
- C. Funds will be drawn from Allowance only with District approval evidenced by an Allowance Expenditure Directive.
- D. At Contract closeout, funds remaining in Allowance will be credited to District by Change Order.
- E. Whenever costs are more than the Allowance, the amount covered by the Allowance will be approved at cost. The Contract Price shall be adjusted by Change Order for amounts in excess of the Allowance.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

END OF DOCUMENT

PRODUCT OPTIONS AND SUBSTITUTIONS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. Instructions to Bidders;
- B. General Conditions, including, without limitation, Substitutions For Specified Items; and
- C. Special Conditions.

1.02 SUBSTITUTIONS OF MATERIALS AND EQUIPMENT

- A. Catalog numbers and specific brands or trade names followed by the designation "or equal" are used in conjunction with material and equipment required by the Specifications to establish the standards of quality, utility, and appearance required. Substitutions which are equal in quality, utility, and appearance to those specified may be reviewed subject to the provisions of the General Conditions.
- B. Wherever more than one manufacturer's product is specified, the first-named product is the basis for the design used in the work and the use of alternative-named manufacturers' products or substitutes may require modifications in that design. If such alternatives are proposed by Contractor and are approved by the District and/or the Architect, Contractor shall assume all costs required to make necessary revisions and modifications of the design resulting from the substitutions requested by the Contractor.
- C. When materials and equipment are specified by first manufacturer's name and product number, second manufacturer's name and "or approved equal," supporting data for the second product, if proposed by Contractor, shall be submitted in accordance with the requirements for substitutions. The District's Board has found and determined that certain item(s) shall be used on this Project based on the purpose(s) indicated pursuant to Public Contract Code section 3400(c). These findings, as well as the products and brand or trade names, have been identified in the Notice to Bidders.
- D. The Contractor will not be allowed to substitute specified items unless the request for substitution is submitted as follows:
 - (1) District must receive any notice of request for substitution of a specified item a minimum of ten (10) calendar days prior to bid opening.

- (2) Within 35 days after the date of the Notice of Award, the Contractor shall submit data substantiating the request(s) for all substitution(s) containing sufficient information to assess acceptability of product or system and impact on Project, including, without limitation, the requirements specified in the Special Conditions and the technical Specifications. Insufficient information shall be grounds for rejection of substitution.
- E. If the District and/or Architect, in reviewing proposed substitute materials and equipment, require revisions or corrections to be made to previously accepted Shop Drawings and supplemental supporting data to be resubmitted, Contractor shall promptly do so. If any proposed substitution is judged by the District and/or Architect to be unacceptable, the specified material or equipment shall be provided.
- F. Samples may be required. Tests required by the District and/or Architect for the determination of quality and utility shall be made at the expense of Contractor, with acceptance of the test procedure first given by the District.
- G. In reviewing the supporting data submitted for substitutions, the District and/or Architect will use for purposes of comparison all the characteristics of the specified material or equipment as they appear in the manufacturer's published data even though all the characteristics may not have been particularly mentioned in the Contract Documents. If more than two (2) submissions of supporting data are required, the cost of reviewing the additional supporting data shall be borne by Contractor, and the District will deduct the costs from the Contract Price. The Contractor shall be responsible for any re-design costs occasioned by District's acceptance and/or approval of any substitute.
- H. The Contractor shall, in the event that a substitute is less costly than that specified, credit the District with one hundred percent (100%) of the net difference between the substitute and the originally specified material. In this event, the Contractor agrees to execute a deductive Change Order to reflect that credit. In the event Contractor furnishes a material, process, or article more expensive than that specified, the difference in the cost of that material, process, or article so furnished shall be borne by Contractor.
- I. In no event shall the District be liable for any increase in Contract Price or Contract Time due to any claimed delay in the evaluation of any proposed substitute or in the acceptance or rejection of any proposed substitute.

PART 2 – PRODUCTS Not Used.

PART 3 – EXECUTION Not Used.

END OF DOCUMENT

DOCUMENT 01 26 00

CHANGES IN THE WORK

CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE PROVISIONS IN THE AGREEMENT, GENERAL CONDITIONS, AND SPECIAL CONDITIONS, IF USED, RELATED TO CHANGES AND/OR REQUESTS FOR CHANGES.

END OF DOCUMENT

DOCUMENT 01 29 00

**APPLICATION FOR PAYMENT AND
CONDITIONAL AND UNCONDITIONAL WAIVER AND RELEASE FORMS**

**CONTRACTOR SHALL COMPLY WITH ALL PROVISIONS IN THE GENERAL
CONDITIONS RELATED TO APPLICATIONS FOR PAYMENT AND/OR PAYMENTS.**

**CONDITIONAL WAIVER AND RELEASE
ON PROGRESS PAYMENT
(CIVIL CODE SECTION 8132)**

NOTICE: THIS DOCUMENT WAIVES THE CLAIMANT'S LIEN, STOP PAYMENT NOTICE, AND PAYMENT BOND RIGHTS EFFECTIVE ON RECEIPT OF PAYMENT. A PERSON SHOULD NOT RELY ON THIS DOCUMENT UNLESS SATISFIED THAT THE CLAIMANT HAS RECEIVED PAYMENT.

Name of Claimant: _____

Name of Customer: _____

Job Location: _____

Owner: _____

Through Date: _____

Conditional Waiver and Release

This document waives and releases lien, stop payment notice, and payment bond rights the claimant has for labor and service provided, and equipment and material delivered, to the customer on this job through the Through Date of this document. Rights based upon labor or service provided, or equipment or material delivered, pursuant to a written change order that has been fully executed by the parties prior to the date that this document is signed by the claimant, are waived and released by this document, unless listed as an Exception below. This document is effective only on the claimant's receipt of payment from the financial institution on which the following check is drawn:

Maker of Check: _____

Amount of Check: \$_____

Check Payable to: _____

Exceptions

This document does not affect any of the following:

- (1) Retentions.
- (2) Extras for which the claimant has not received payment.
- (3) The following progress payments for which the claimant has previously given a conditional waiver and release but has not received payment:

Date(s) of waiver and release: _____

Amount(s) of unpaid progress payment(s): \$_____

TRACY UNIFIED SCHOOL DISTRICT

**APPLICATION FOR PAYMENT AND
CONDITIONAL AND UNCONDITIONAL
WAIVER AND RELEASE FORMS
DOCUMENT 01 29 00-2**

- (4) Contract rights, including (A) a right based on rescission, abandonment, or breach of contract, and (B) the right to recover compensation for work not compensated by the payment.

Claimant's Signature: _____

Claimant's Title: _____

Date of Signature: _____

**UNCONDITIONAL WAIVER AND RELEASE
ON PROGRESS PAYMENT
(CIVIL CODE SECTION 8134)**

NOTICE TO CLAIMANT: THIS DOCUMENT WAIVES AND RELEASES LIEN, STOP PAYMENT NOTICE, AND PAYMENT BOND RIGHTS UNCONDITIONALLY AND STATES THAT YOU HAVE BEEN PAID FOR GIVING UP THOSE RIGHTS. THIS DOCUMENT IS ENFORCEABLE AGAINST YOU IF YOU SIGN IT, EVEN IF YOU HAVE NOT BEEN PAID. IF YOU HAVE NOT BEEN PAID, USE A CONDITIONAL WAIVER AND RELEASE FORM.

Name of Claimant: _____

Name of Customer: _____

Job Location: _____

Owner: _____

Through Date: _____

Unconditional Waiver and Release

This document waives and releases lien, stop payment notice, and payment bond rights the claimant has for labor and service provided, and equipment and material delivered, to the customer on this job through the Through Date of this document. Rights based upon labor or service provided, or equipment or material delivered, pursuant to a written change order that has been fully executed by the parties prior to the date that this document is signed by the claimant, are waived and released by this document, unless listed as an Exception below. The claimant has received the following progress payment: \$_____

Exceptions

This document does not affect any of the following:

- (1) Retentions.
- (2) Extras for which the claimant has not received payment.
- (3) Contract rights, including (A) a right based on rescission, abandonment, or breach of contract, and (B) the right to recover compensation for work not compensated by the payment.

Claimant's Signature: _____

Claimant's Title: _____

Date of Signature: _____

**CONDITIONAL WAIVER AND RELEASE
ON FINAL PAYMENT**
(CIVIL CODE SECTION 8136)

NOTICE: THIS DOCUMENT WAIVES THE CLAIMANT'S LIEN, STOP PAYMENT NOTICE, AND PAYMENT BOND RIGHTS EFFECTIVE ON RECEIPT OF PAYMENT. A PERSON SHOULD NOT RELY ON THIS DOCUMENT UNLESS SATISFIED THAT THE CLAIMANT HAS RECEIVED PAYMENT.

Name of Claimant: _____

Name of Customer: _____

Job Location: _____

Owner: _____

Conditional Waiver and Release

This document waives and releases lien, stop payment notice, and payment bond rights the claimant has for labor and service provided, and equipment and material delivered, to the customer on this job. Rights based upon labor or service provided, or equipment or material delivered, pursuant to a written change order that has been fully executed by the parties prior to the date that this document is signed by the claimant, are waived and released by this document, unless listed as an Exception below. This document is effective only on the claimant's receipt of payment from the financial institution on which the following check is drawn:

Maker of Check:

Amount of Check: \$_____

Check Payable to: _____

Exceptions

This document does not affect any of the following: _____

Disputed claims for extras in the amount of: \$_____

Claimant's Signature: _____

Claimant's Title: _____

Date of Signature: _____

**UNCONDITIONAL WAIVER AND RELEASE
ON FINAL PAYMENT**
(CIVIL CODE SECTION 8138)

NOTICE TO CLAIMANT: THIS DOCUMENT WAIVES AND RELEASES LIEN, STOP PAYMENT NOTICE, AND PAYMENT BOND RIGHTS UNCONDITIONALLY AND STATES THAT YOU HAVE BEEN PAID FOR GIVING UP THOSE RIGHTS. THIS DOCUMENT IS ENFORCEABLE AGAINST YOU IF YOU SIGN IT, EVEN IF YOU HAVE NOT BEEN PAID. IF YOU HAVE NOT BEEN PAID, USE A CONDITIONAL WAIVER AND RELEASE FORM.

Name of Claimant: _____

Name of Customer: _____

Job Location: _____

Owner: _____

Unconditional Waiver and Release

This document waives and releases lien, stop payment notice, and payment bond rights the claimant has for all labor and service provided, and equipment and material delivered, to the customer on this job. Rights based upon labor or service provided, or equipment or material delivered, pursuant to a written change order that has been fully executed by the parties prior to the date that this document is signed by the claimant, are waived and released by this document, unless listed as an Exception below. The claimant has been paid in full.

Exceptions

This document does not affect any of the following: _____

Disputed claims for extras in the amount of: \$_____

Claimant's Signature: _____

Claimant's Title: _____

Date of Signature: _____

PROJECT MEETINGS

PART 1 – GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions; and
- B. Special Conditions.

1.02 PROGRESS MEETINGS:

- A. Contractor shall schedule and hold regular weekly progress meetings after a minimum of one week's prior written notice of the meeting date and time to all Invitees as indicated below.
- B. Location: Contractor's field office.
- C. The Contractor shall notify and invite the following entities ("Invitees"):
 - (1) District Representative.
 - (2) Contractor.
 - (3) Contractor's Project Manager.
 - (4) Contractor's Superintendent.
 - (5) Subcontractors, as appropriate to the agenda of the meeting.
 - (6) Suppliers, as appropriate to the agenda of the meeting.
 - (7) Construction Manager, if any.
 - (8) Architect
 - (9) Engineer(s), if any and as appropriate to the agenda of the meeting.
 - (10) Others, as appropriate to the agenda of the meeting.
- D. The District's and/or the Architect's Consultants will attend at their discretion, in response to the agenda.
- E. The District representative, the Construction Manager, and/or another District Agent shall take and distribute meeting notes to attendees and other concerned parties. If exceptions are taken to anything in the meeting notes,

those exceptions shall be stated in writing to the District within five (5) working days following District's distribution of the meeting notes.

1.03 PRE-INSTALLATION/PERFORMANCE MEETING:

- A. Contractor shall schedule a meeting prior to the start of each of the demolition work phases. Contractor shall invite all Invitees to this meeting, and others whose work may affect or be affected by the quality of the demolition work.
- B. Contractor shall review in detail prior to this meeting, the manufacturer's requirements and specifications, applicable portions of the Contract Documents, Shop Drawings, and other submittals, and other related work. At this meeting, invitees shall review and resolve conflicts, incompatibilities, or inadequacies discovered or anticipated.
- C. Contractor shall review in detail Project conditions, schedule, requirements for performance, application, installation, and quality of completed Work, and protection of adjacent Work and property.
- D. Contractor shall review in detail means of protecting the completed Work during the remainder of the construction period.

PART 2 - PRODUCTS Not Used.

PART 3 - EXECUTION Not Used.

END OF DOCUMENT

SCHEDULING OF WORK

PART 1 – GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions;
- B. Special Conditions;
- C. Summary of Work; and
- D. Submittals.

1.02 SECTION INCLUDES

- A. Scheduling of Work under this Contract shall be performed by Contractor in accordance with requirements of this Section.
 - (1) Development of schedule, cost and resource loading of the schedule, monthly payment requests, and project status reporting requirements of the Contract shall employ computerized Critical Path Method ("CPM") scheduling ("CPM Schedule").
 - (2) CPM Schedule shall be cost loaded based on Schedule of Values as approved by District.
 - (3) Submit schedules and reports as specified in the General Conditions.
- B. Upon Award of Contract, Contractor shall immediately commence development of Initial and Original CPM Schedules to ensure compliance with CPM Schedule submittal requirements.

1.03 CONSTRUCTION SCHEDULE

- A. Within ten (10) days of issuance of the issuance Notice to Proceed and before request for first progress payment, the Contractor shall prepare and submit to the Project Manager a construction progress schedule conforming to the Milestone Schedule below.
- B. The Construction Schedule shall be continuously updated, and an updated schedule shall be submitted with each application for progress payment. Each revised schedule shall indicate the work actually accomplished during the previous period and the schedule for completion of the remaining work.

C. Milestone Schedule:

ACTIVITY DESCRIPTION

REQUIRED COMPLETION

CONSTRUCTION STARTS

05-26-2022

PHASE 1 DEMOLITION

PHASE 2 DEMOLITION

FINAL PROJECT COMPLETION

1.04 QUALIFICATIONS

- A. Contractor shall employ experienced scheduling personnel qualified to use the latest version of [i.e., Primavera Project Planner]. Experience level required is set forth below. Contractor may employ such personnel directly or may employ a consultant for this purpose.
- (1) The written statement shall identify the individual who will perform CPM scheduling.
 - (2) Capability and experience shall be verified by description of construction projects on which individual has successfully applied computerized CPM.
 - (3) Required level of experience shall include at least two (2) projects of similar nature and scope with value not less than three fourths ($\frac{3}{4}$) of the Total Bid Price of this Project. The written statement shall provide contact persons for referenced projects with current telephone and address information.
- B. District reserves the right to approve or reject Contractor's scheduler or consultant at any time. District reserves the right to refuse replacing of Contractor's scheduler or consultant, if District believes replacement will negatively affect the scheduling of Work under this Contract.

1.05 GENERAL

- A. Progress Schedule shall be based on and incorporate milestone and completion dates specified in Contract Documents.
- B. Overall time of completion and time of completion for each milestone shown on Progress Schedule shall adhere to times in the Contract, unless an earlier (advanced) time of completion is requested by Contractor and agreed to by District. Any such agreement shall be formalized by a Change Order.
- (1) District is not required to accept an early completion schedule, i.e., one that shows an earlier completion date than the Contract Time.
 - (2) Contractor shall not be entitled to extra compensation in event agreement is reached on an earlier completion schedule and Contractor completes its Work, for whatever reason, beyond completion date shown in its early completion schedule but within the Contract Time.

- (3) A schedule showing the work completed in less than the Contract Time, and that has been accepted by District, shall be considered to have Project Float. The Project Float is the time between the scheduled completion of the work and the Completion Date. Project Float is a resource available to both District and the Contractor.
- C. Ownership Project Float: Neither the District nor Contractor owns Project Float. The Project owns the Project Float. As such, liability for delay of the Completion Date rests with the party whose actions, last in time, actually cause delay to the Completion Date.
 - (1) For example, if Party A uses some, but not all of the Project Float and Party B later uses remainder of the Project Float as well as additional time beyond the Project Float, Party B shall be liable for the time that represents a delay to the Completion Date.
 - (2) Party A would not be responsible for the time since it did not consume the entire Project Float and additional Project Float remained; therefore, the Completion Date was unaffected by Party A.
- D. Progress Schedule shall be the basis for evaluating job progress, payment requests, and time extension requests. Responsibility for developing Contract CPM Schedule and monitoring actual progress as compared to Progress Schedule rests with Contractor.
- E. Failure of Progress Schedule to include any element of the Work, or any inaccuracy in Progress Schedule, will not relieve Contractor from responsibility for accomplishing the Work in accordance with the Contract. District's acceptance of schedule shall be for its use in monitoring and evaluating job progress, payment requests, and time extension requests and shall not, in any manner, impose a duty of care upon District, or act to relieve Contractor of its responsibility for means and methods of construction.
- F. Software: Use [i.e, District Project Planner for Windows, latest version]. Such software shall be compatible with Windows operating system. Contractor shall transmit contract file to District on compact disk at times requested by District.
- G. Transmit each item under the form approved by District.
 - (1) Identify Project with District Contract number and name of Contractor.
 - (2) Provide space for Contractor's approval stamp and District's review stamps.
 - (3) Submittals received from sources other than Contractor will be returned to the Contractor without District's review.

1.06 INITIAL CPM SCHEDULE

- A. Initial CPM Schedule submitted for review at the pre-construction conference shall serve as Contractor's schedule for up to ninety (90) calendar days after the Notice to Proceed.

- B. Indicate detailed plan for the Work to be completed in first ninety (90) days of the Contract; details of planned mobilization of plant and equipment; sequence of early operations; procurement of materials and equipment. Show Work beyond ninety (90) calendar days in summary form.
- C. Initial CPM Schedule shall be time scaled.
- D. Initial CPM Schedule shall be cost and resource loaded. Accepted cost and resource loaded schedule will be used as basis for monthly progress payments until acceptance of the Original CPM Schedule. Use of Initial CPM Schedule for progress payments shall not exceed ninety (90) calendar days.
- E. District and Contractor shall meet to review and discuss the Initial CPM Schedule within seven (7) calendar days after it has been submitted to District.
 - (1) District's review and comment on the schedule shall be limited to Contract conformance (with sequencing, coordination, and milestone requirements).
 - (2) Contractor shall make corrections to schedule necessary to comply with Contract requirements and shall adjust schedule to incorporate any missing information requested by District. Contractor shall resubmit Initial CPM Schedule if requested by District.
- F. If, during the first ninety (90) days after Notice to Proceed, the Contractor is of the opinion that any of the Work included on its Initial CPM Schedule has been impacted, the Contractor shall submit to District a written Time Impact Evaluation ("TIE") in accordance with Article 1.12 of this Section. The TIE shall be based on the most current update of the Initial CPM Schedule.

1.07 ORIGINAL CPM SCHEDULE

- A. Submit a detailed proposed Original CPM Schedule presenting an orderly and realistic plan for completion of the Work in conformance with requirements as specified herein.
- B. Progress Schedule shall include or comply with following requirements:
 - (1) Time scaled, cost and resource (labor and major equipment) loaded CPM schedule.
 - (2) No activity on schedule shall have duration longer than fifteen (15) work days, with exception of submittal, approval, fabrication and procurement activities, unless otherwise approved by District.
 - (a) Activity durations shall be total number of actual work days required to perform that activity.
 - (3) The start and completion dates of all items of Work, their major components, and milestone completion dates, if any.

- (4) District furnished materials and equipment, if any, identified as separate activities.
- (5) Activities for maintaining Project Record Documents.
- (6) Dependencies (or relationships) between activities.
- (7) Processing/approval of submittals and shop drawings for all material and equipment required per the Contract. Activities that are dependent on submittal acceptance or material delivery shall not be scheduled to start earlier than expected acceptance or delivery dates.
 - (a) Include time for submittals, re-submittals and reviews by District. Coordinate with accepted schedule for submission of Shop Drawings, samples, and other submittals.
 - (b) Contractor shall be responsible for all impacts resulting from re-submittal of Shop Drawings and submittals.
- (8) Procurement of major equipment, through receipt and inspection at jobsite, identified as separate activity.
 - (a) Include time for fabrication and delivery of manufactured products for the Work.
 - (b) Show dependencies between procurement and construction.
- (9) Activity description; what Work is to be accomplished and where.
- (10) The total cost of performing each activity shall be total of labor, material, and equipment, excluding overhead and profit of Contractor. Overhead and profit of the General Contractor shall be shown as a separate activity in the schedule. Sum of cost for all activities shall equal total Contract value.
- (11) Resources required (labor and major equipment) to perform each activity.
- (12) Responsibility code for each activity corresponding to Contractor or Subcontractor responsible for performing the Work.
- (13) Identify the activities which constitute the controlling operations or critical path. No more than twenty-five (25%) of the activities shall be critical or near critical. Near critical is defined as float in the range of one (1) to (10) days.
- (14) Twenty (20) workdays for developing punch list(s), completion of punch-list items, and final clean up for the Work or any designated portion thereof. No other activities shall be scheduled during this period.
- (15) Interface with the work of other contractors, District, and agencies such as, but not limited to, utility companies.

- (16) Show detailed Subcontractor Work activities. In addition, furnish copies of Subcontractor schedules upon which CPM was built.
 - (a) Also furnish for each Subcontractor, as determined by District, submitted on Subcontractor letterhead, a statement certifying that Subcontractor concurs with Contractor's Original CPM Schedule and that Subcontractor's related schedules have been incorporated, including activity duration, cost and resource loading.
 - (b) Subcontractor schedules shall be independently derived and not a copy of Contractor's schedule.
 - (c) In addition to Contractor's schedule and resource loading, obtain from electrical, mechanical, and plumbing Subcontractors, and other Subcontractors as required by District, productivity calculations common to their trades, such as units per person day, feet of pipe per day per person, feet of wiring per day per person, and similar information.
 - (d) Furnish schedule for Contractor/Subcontractor CPM schedule meetings which shall be held prior to submission of Original CPM schedule to District. District shall be permitted to attend scheduled meetings as an observer.
- (17) Activity durations shall be in Work days.
- (18) Submit with the schedule a list of anticipated non-Work days, such as weekends and holidays. The Progress Schedule shall exclude in its Work day calendar all non-Work days on which Contractor anticipates critical Work will not be performed.
- C. Original CPM Schedule Review Meeting: Contractor shall, within sixty (60) days from the Notice to Proceed date, meet with District to review the Original CPM Schedule submittal.
 - (1) Contractor shall have its Project Manager, Project Superintendent, Project Scheduler, and key Subcontractor representatives, as required by District, in attendance. The meeting will take place over a continuous one (1) day period.
 - (2) District's review will be limited to submittal's conformance to Contract requirements including, but not limited to, coordination requirements. However, review may also include:
 - (a) Clarifications of Contract Requirements.
 - (b) Directions to include activities and information missing from submittal.
 - (c) Requests to Contractor to clarify its schedule.

- (3) Within five (5) days of the Schedule Review Meeting, Contractor shall respond in writing to all questions and comments expressed by District at the Meeting.

1.08 ADJUSTMENTS TO CPM SCHEDULE

- A. Adjustments to Original CPM Schedule: Contractor shall have adjusted the Original CPM Schedule submittal to address all review comments from original CPM Schedule review meeting and resubmit network diagrams and reports for District's review.
 - (1) District, within ten (10) days from date that Contractor submitted the revised schedule, will either:
 - (a) Accept schedule and cost and resource loaded activities as submitted, or
 - (b) Advise Contractor in writing to review any part or parts of schedule which either do not meet Contract requirements or are unsatisfactory for District to monitor Project's progress, resources, and status or evaluate monthly payment request by Contractor.
 - (2) District may accept schedule with conditions that the first monthly CPM Schedule update be revised to correct deficiencies identified.
 - (3) When schedule is accepted, it shall be considered the "Original CPM Schedule" which will then be immediately updated to reflect the current status of the work.
 - (4) District reserves right to require Contractor to adjust, add to, or clarify any portion of schedule which may later be discovered to be insufficient for monitoring of Work or approval of partial payment requests. No additional compensation will be provided for such adjustments, additions, or clarifications.
- B. Acceptance of Contractor's schedule by District will be based solely upon schedule's compliance with Contract requirements.
 - (1) By way of Contractor assigning activity durations and proposing sequence of Work, Contractor agrees to utilize sufficient and necessary management and other resources to perform work in accordance with the schedule.
 - (2) Upon submittal of schedule update, updated schedule shall be considered "current" CPM Schedule.
 - (3) Submission of Contractor's schedule to District shall not relieve Contractor of total responsibility for scheduling, sequencing, and pursuing Work to comply with requirements of Contract Documents, including adverse effects such as delays resulting from ill-timed Work.

- C. Submittal of Original CPM Schedule, and subsequent schedule updates, shall be understood to be Contractor's representation that the Schedule meets requirements of Contract Documents and that Work shall be executed in sequence indicated on the schedule.
- D. Contractor shall distribute Original CPM Schedule to Subcontractors for review and written acceptance, which shall be noted on Subcontractors' letterheads to Contractor and transmitted to District for the record.

1.09 MONTHLY CPM SCHEDULE UPDATE SUBMITTALS

- A. Following acceptance of Contractor's Original CPM Schedule, Contractor shall monitor progress of Work and adjust schedule each month to reflect actual progress and any anticipated changes to planned activities.
 - (1) Each schedule update submitted shall be complete, including all information requested for the Original CPM Schedule submittal.
 - (2) Each update shall continue to show all Work activities including those already completed. These completed activities shall accurately reflect "as built" information by indicating when activities were actually started and completed.
- B. A meeting will be held on approximately the twenty-fifth (25th) of each month to review the schedule update submittal and progress payment application.
 - (1) At this meeting, at a minimum, the following items will be reviewed: Percent (%) complete of each activity; Time Impact Evaluations for Change Orders and Time Extension Request; actual and anticipated activity sequence changes; actual and anticipated duration changes; and actual and anticipated Contractor delays.
 - (2) These meetings are considered a critical component of overall monthly schedule update submittal and Contractor shall have appropriate personnel attend. At a minimum, these meetings shall be attended by Contractor's General Superintendent and Scheduler.
 - (3) Contractor shall plan on the meeting taking no less than four (4) hours.
- C. Within five (5) working days after monthly schedule update meeting, Contractor shall submit the updated CPM Schedule update.
- D. Within five (5) work days of receipt of above noted revised submittals, District will either accept or reject monthly schedule update submittal.
 - (1) If accepted, percent (%) complete shown in monthly update will be basis for Application for Payment by the Contractor. The schedule update shall be submitted as part of the Contractor's Application for Payment.

- (2) If rejected, update shall be corrected and resubmitted by Contractor before the Application for Payment is submitted.
- E. Neither updating, changing or revising of any report, curve, schedule, or narrative submitted to District by Contractor under this Contract, nor District's review or acceptance of any such report, curve, schedule or narrative shall have the effect of amending or modifying in any way the Completion Date or milestone dates or of modifying or limiting in any way Contractor's obligations under this Contract.

1.10 SCHEDULE REVISIONS

- A. Updating the Schedule to reflect actual progress shall not be considered revisions to the Schedule. Since scheduling is a dynamic process, revisions to activity durations and sequences are expected on a monthly basis.
- B. To reflect revisions to the Schedule, the Contractor shall provide District with a written narrative with a full description and reasons for each Work activity revised. For revisions affecting the sequence of work, the Contractor shall provide a schedule diagram which compares the original sequence to the revised sequence of work. The Contractor shall provide the written narrative and schedule diagram for revisions two (2) working days in advance of the monthly schedule update meeting.
- C. Schedule revisions shall not be incorporated into any schedule update until the revisions have been reviewed by District. District may request further information and justification for schedule revisions and Contractor shall, within three (3) days, provide District with a complete written narrative response to District's request.
- D. If the Contractor's revision is still not accepted by District, and the Contractor disagrees with District's position, the Contractor has seven (7) calendar days from receipt of District's letter rejecting the revision to provide a written narrative providing full justification and explanation for the revision. The Contractor's failure to respond in writing within seven (7) calendar days of District's written rejection of a schedule revision shall be contractually interpreted as acceptance of District's position, and the Contractor waives its rights to subsequently dispute or file a claim regarding District's position.
- E. At District's discretion, the Contractor can be required to provide Subcontractor certifications of performance regarding proposed schedule revisions affecting said Subcontractors.

1.11 RECOVERY SCHEDULE

- A. If the Schedule Update shows a completion date twenty-one (21) calendar days beyond the Contract Completion Date, or individual milestone completion dates, the Contractor shall submit to District the proposed revisions to recover the lost time within seven (7) calendar days. As part of this submittal, the Contractor shall provide a written narrative for each revision made to recapture the lost time. If the revisions include sequence changes, the Contractor shall provide a schedule diagram comparing the original sequence to the revised sequence of work.

- B. The revisions shall not be incorporated into any schedule update until the revisions have been reviewed by District.
- C. If the Contractor's revisions are not accepted by District, District and the Contractor shall follow the procedures in paragraph 1.09.C, 1.09.D and 1.09.E above.
- D. At District's discretion, the Contractor can be required to provide Subcontractor certifications for revisions affecting said Subcontractors.

1.12 TIME IMPACT EVALUATION ("TIE") FOR CHANGE ORDERS, AND OTHER DELAYS

- A. When Contractor is directed to proceed with changed Work, the Contractor shall prepare and submit within fourteen (14) calendar days from the Notice to Proceed a TIE which includes both a written narrative and a schedule diagram depicting how the changed Work affects other schedule activities. The schedule diagram shall show how the Contractor proposes to incorporate the changed Work in the schedule and how it impacts the current schedule-update critical path. The Contractor is also responsible for requesting time extensions based on the TIE's impact on the critical path. The diagram must be tied to the main sequence of schedule activities to enable District to evaluate the impact of changed Work to the scheduled critical path.
- B. Contractor shall be required to comply with the requirements of Paragraph 1.09.A for all types of delays such as, but not limited to, Contractor/Subcontractor delays, adverse weather delays, strikes, procurement delays, fabrication delays, etc.
- C. Contractor shall be responsible for all costs associated with the preparation of TIEs, and the process of incorporating them into the current schedule update. The Contractor shall provide District with four (4) copies of each TIE.
- D. Once agreement has been reached on a TIE, the Contract Time will be adjusted accordingly. If agreement is not reached on a TIE, the Contract Time may be extended in an amount District allows, and the Contractor may submit a claim for additional time claimed by contractor.

1.13 TIME EXTENSIONS

- A. The Contractor is responsible for requesting time extensions for time impacts that, in the opinion of the Contractor, impact the critical path of the current schedule update. Notice of time impacts shall be given in accord with the General Conditions.
- B. Where an event for which District is responsible impacts the projected Completion Date, the Contractor shall provide a written mitigation plan, including a schedule diagram, which explains how (e.g., increase crew size, overtime, etc.) the impact can be mitigated. The Contractor shall also include a detailed cost breakdown of the labor, equipment, and material the Contractor would expend to mitigate District-caused time impact. The Contractor shall submit its mitigation plan to District within fourteen (14)

calendar days from the date of discovery of the impact. The Contractor is responsible for the cost to prepare the mitigation plan.

- C. Failure to request time, provide TIE, or provide the required mitigation plan will result in Contractor waiving its right to a time extension and cost to mitigate the delay.
- D. No time will be granted under this Contract for cumulative effect of changes.
- E. District will not be obligated to consider any time extension request unless the Contractor complies with the requirements of Contract Documents.
- F. Failure of the Contractor to perform in accordance with the current schedule update shall not be excused by submittal of time extension requests.
- G. If the Contractor does not submit a TIE within the required fourteen (14) calendar days for any issue, it is mutually agreed that the Contractor does not require a time extension for said issue.

1.14 SCHEDULE REPORTS

- A. Submit four (4) copies of the following reports with the Initial CPM Schedule, the Original CPM Schedule, and each monthly update.
- B. Required Reports:
 - (1) Two activity listing reports: one sorted by activity number and one by total Project Float. These reports shall also include each activity's early/late and actual start and finish dates, original and remaining duration, Project Float, responsibility code, and the logic relationship of activities.
 - (2) Cost report sorted by activity number including each activity's associated cost, percentage of Work accomplished, earned value- to date, previous payments, and amount earned for current update period.
 - (3) Schedule plots presenting time-scaled network diagram showing activities and their relationships with the controlling operations or critical path clearly highlighted.
 - (4) Cash flow report calculated by early start, late start, and indicating actual progress. Provide an exhibit depicting this information in graphic form.
 - (5) Planned versus actual resource (i.e., labor) histogram calculated by early start and late start.
- C. Other Reports:

In addition to above reports, District may request, from month to month, any two of the following reports. Submit four (4) copies of all reports.

- (1) Activities by early start.
 - (2) Activities by late start.
 - (3) Activities grouped by Subcontractors or selected trades.
 - (4) Activities with scheduled early start dates in a given time frame, such as fifteen (15) or thirty (30) day outlook.
- D. Furnish District with report files on compact disks containing all schedule files for each report generated.

1.15 PROJECT STATUS REPORTING

- A. In addition to submittal requirements for CPM scheduling identified in this Section, Contractor shall provide a monthly project status report (i.e., written narrative report) to be submitted in conjunction with each CPM Schedule as specified herein. Status reporting shall be in form specified below.
- B. Contractor shall prepare monthly written narrative reports of status of Project for submission to District. Written status reports shall include:
- (1) Status of major Project components (percent (%) complete, amount of time ahead or behind schedule) and an explanation of how Project will be brought back on schedule if delays have occurred.
 - (2) Progress made on critical activities indicated on CPM Schedule.
 - (3) Explanations for any lack of work on critical path activities planned to be performed during last month.
 - (4) Explanations for any schedule changes, including changes to logic or to activity durations.
 - (5) List of critical activities scheduled to be performed next month.
 - (6) Status of major material and equipment procurement.
 - (7) Any delays encountered during reporting period.
 - (8) Contractor shall provide printed report indicating actual versus planned resource loading for each trade and each activity. This report shall be provided on weekly and monthly basis.
 - (a) Actual resource shall be accumulated in field by Contractor, and shall be as noted on Contractor's daily reports. These reports will be basis for information provided in computer-generated monthly and weekly printed reports.
 - (b) Contractor shall explain all variances and mitigation measures.

- (9) Contractor may include any other information pertinent to status of Project. Contractor shall include additional status information requested by District at no additional cost.
- (10) Status reports, and the information contained therein, shall not be construed as claims, notice of claims, notice of delay, or requests for changes or compensation.

1.16 WEEKLY SCHEDULE REPORT

At the Weekly Progress Meeting, the Contractor shall provide and present a time-scaled three (3) week look-ahead schedule that is based and correlated by activity number to the current schedule (i.e., Initial, Original CPM, or Schedule Update).

1.17 DAILY CONSTRUCTION REPORTS

On a daily basis, Contractor shall submit a daily activity report to District for each workday, including weekends and holidays when worked. Contractor shall develop the daily construction reports on a computer-generated database capable of sorting daily Work, manpower, and man-hours by Contractor, Subcontractor, area, sub-area, and Change Order Work. Upon request of District, furnish computer disk of this data base. Obtain District's written approval of daily construction report data base format prior to implementation. Include in report:

- A. Project name and Project number.
- B. Contractor's name and address.
- C. Weather, temperature, and any unusual site conditions.
- D. Brief description and location of the day's scheduled activities and any special problems and accidents, including Work of Subcontractors. Descriptions shall be referenced to CPM scheduled activities.
- E. Worker quantities for its own Work force and for Subcontractors of any tier.
- F. Equipment, other than hand tools, utilized by Contractor and Subcontractors.

1.18 PERIODIC VERIFIED REPORTS

Contractor shall complete and verify construction reports on a form prescribed by the Division of the State Architect and file reports on the first day of February, May, August, and November during the preceding quarter year; at the completion of the Contract; at the completion of the Work; at the suspension of Work for a period of more than one (1) month; whenever the services of Contractor or any of Contractor's Subcontractors are terminated for any reason; and at any time a special verified report is required by the Division of the State Architect. Refer to section 4-336 and section 4-343 of Part 1, Title 24 of the California Code of Regulations.

PART 2 – PRODUCTS Not Used.

PART 3 - EXECUTION Not Used.

END OF DOCUMENT

SUBMITTALS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Contractor's Submittals and Schedules, Drawings and Specifications;
- B. Special Conditions.

1.02 SECTION INCLUDES:

- A. Definitions:
 - (1) Shop Drawings and Product Data are as indicated in the General Conditions and include, but are not limited to, fabrication, erection, layout and setting drawings, formwork and falsework drawings, manufacturers' standard drawings, descriptive literature, catalogues, brochures, performance and test data, wiring and control diagrams. In addition, there are other drawings and descriptive data pertaining to materials, equipment, piping, duct and conduit systems, and methods of construction as may be required to show that the materials, equipment or systems and all positions conform to the requirement of the Contract Documents, including, without limitation, the Drawings.
 - (2) "Manufactured" applies to standard units usually mass-produced; "fabricated" means specifically assembled or made out of selected materials to meet design requirements. Shop Drawings shall establish the actual detail of manufactured or fabricated items, indicated proper relation to adjoining work and amplify design details of mechanical and electrical equipment in proper relation to physical spaces in the structure.
 - (3) Manufacturer's Instructions: Where any item of Work is required by the Contract Documents to be furnished, installed, or performed, at a minimum, in accordance with a specified product manufacturer's instructions, the Contractor shall procure and distribute copies of these to the District, the Architect, and all other concerned parties and shall furnish, install, or perform the work, at a minimum, in accordance with those instructions.
- B. Samples, Shop Drawings, Product Data, and other items as specified, in accordance with the following requirements:
 - (1) Contractor shall submit all Shop Drawings, Product Data, and Samples to the District, the Architect, the Project Inspector, and the Construction Manager.

Contractor to review section
01 3300 as well as this
document

- (2) Contractor shall comply with all time frames herein and in the General Conditions and, in any case, shall submit required information in sufficient time to permit proper consideration and action before ordering any materials or items represented by such Shop Drawings, Product Data, and/or Samples.
- (3) Contractor shall allow sufficient time so that no delay occurs due to required lead time in ordering or delivery of any item to the Site. Contractor shall be responsible for any delay in progress of Work due to its failure to observe these requirements.
- (4) Time for completion of Work shall not be extended on account of Contractor's failure to promptly submit Shop Drawings, Product Data, and/or Samples.
- (5) Reference numbers on Shop Drawings shall have Architectural and/or Engineering Contract Drawings reference numbers for details, sections, and "cuts" shown on Shop Drawings. These reference numbers shall be in addition to any numbering system that Contractor chooses to use or has adopted as standard.
- (6) When the magnitude or complexity of submittal material prevents a complete review within the stated time frame, Contractor shall make this submittal in increments to avoid extended delays.
- (7) Contractor shall certify on submittals for review that submittals conform to Contract requirements. Also certify that Contractor-furnished equipment can be installed in allocated space. In event of any variance, Contractor shall specifically state in transmittal and on Shop Drawings, portions vary and require approval of a substitute. Submittals shall not be used as a means of requesting a substitution.
- (8) Unless specified otherwise, sampling, preparation of samples, and tests shall be in accordance with the latest standard of the American Society for Testing and Materials.
- (9) Upon demand by Architect or District, Contractor shall submit samples of materials and/or articles for tests or examinations and consideration before Contractor incorporates same in Work. Contractor shall be solely responsible for delays due to sample(s) not being submitted in time to allow for tests. Acceptance or rejection will be expressed in writing. Work shall be equal to approved samples in every respect. Samples that are of value after testing will remain the property of Contractor.

C. Submittal Schedule:

- (1) Contractor shall prepare its proposed submittal schedule that is coordinated with the proposed construction schedule and submit both to the District within ten (10) days after the date of the Notice to Proceed. Contractor's proposed schedules shall become the Project Construction Schedule and the Project Submittal Schedule after each is approved by the District.

Contractor to review section
01 3300 as well as this
document

- (2) Contractor is responsible for all lost time should the initial submittal be rejected, marked "revise and resubmit", etc.
- (3) All Submittals shall be forwarded to the District by the date indicated on the approved Submittal Schedule, unless an earlier date is necessary to maintain the Construction Schedule, in which case those Submittals shall be forwarded to the District so as not to delay the Construction Schedule.
- (4) Contractor may be assessed \$100 a day for each day it is late in submitting a shop drawing or sample. No extensions of time will be granted to Trade Contractor or any Subcontractor because of its failure to have shop drawings and samples submitted in accordance with the Schedule.

1.03 SHOP DRAWINGS:

- A. Contractor shall submit one reproducible transparency and six (6) opaque reproductions. The District will review and return the reproducible copy and one (1) opaque reproduction to Contractor.
- B. Before commencing installation of any Work, the Contractor shall submit and receive approval of all drawings, descriptive data, and material list(s) as required to accomplish Work.
- C. Review of Shop Drawings is regarded as a service to assist Contractor and in all cases original Contract Documents shall take precedence as outlined under General Conditions.
- D. No claim for extra time or payment shall be based on work shown on Shop Drawings unless the claim is (1) noted on Contractor's transmittal letter accompanying Shop Drawings and (2) Contractor has complied with all applicable provisions of the General Conditions, including, without limitation, provisions regarding changes and payment, and all required written approvals.
- E. District shall not review Shop Drawings for quantities of materials or number of items supplied.
- F. District's and/or Architect's review of Shop Drawing will be general. District and/or Architect review does not relieve Contractor of responsibility for dimensions, accuracy, proper fitting, construction of Work, furnishing of materials, or Work required by Contract Documents and not indicated on Shop Drawings. The District's and/or Architect's review of Shop Drawings is not to be construed as approving departures from Contract Documents.
- G. Review of Shop Drawings and Schedules does not relieve Contractor from responsibility for any aspect of those Drawings or Schedules that is a violation of local, County, State, or Federal laws, rules, ordinances, or rules and regulations of commissions, boards, or other authorities or utilities having jurisdiction.
- H. Before submitting Shop Drawings for review, Contractor shall check Shop Drawings of its subcontractors for accuracy, and confirm that all Work

Contractor to review section
01 3300 as well as this
document

contiguous with and having bearing on other work shown on Shop Drawings is accurately drawn and in conformance with Contract Documents.

- I. Submitted drawings and details must bear stamp of approval of Contractor:
 - (1) Stamp and signature shall clearly certify that Contractor has checked Shop Drawings for compliance with Drawings.
 - (2) If Contractor submits a Shop Drawing without an executed stamp of approval, or whenever it is evident (despite stamp) that Drawings have not been checked, the District and/or Architect will not consider them and will return them to the Contractor for revision and resubmission. In that event, it will be deemed that Contractor has not complied with this provision and Contractor shall bear risk of all delays to same extent as if it had not submitted any Shop Drawings or details.
- J. Submission of Shop Drawings (in either original submission or when resubmitted with correction) constitutes evidence that Contractor has checked all information thereon and that it accepts and is willing to perform Work as shown.
- K. Contractor shall pay for cost of any changes in construction due to improper checking and coordination. Contractor shall be responsible for all additional costs, including coordination. Contractor shall be responsible for costs incurred by itself, the District, the Architect, the Project Inspector, the Construction Manager, any other Subcontractor or contractor, etc., due to improperly checked and/or coordination of submittals.
- L. Shop Drawings must clearly delineate the following information:
 - (1) Project name and address.
 - (2) Specification number and description.
 - (3) Architect's name and project number.
 - (4) Shop Drawing title, number, date, and scale.
 - (5) Names of Contractor, Subcontractor(s) and fabricator.
 - (6) Working and erection dimensions.
 - (7) Arrangements and sectional views.
 - (8) Necessary details, including complete information for making connections with other Work.
 - (9) Kinds of materials and finishes.
 - (10) Descriptive names of materials and equipment, classified item numbers, and locations at which materials or equipment are to be installed in the Work. Contractor shall use same reference identification(s) as shown on Contract Drawings.

Contractor to review section
01 3300 as well as this
document

- M. Contractor shall prepare composite drawings and installation layouts when required to solve tight field conditions.
 - (1) Shop Drawings shall consist of dimensioned plans and elevations and must give complete information, particularly as to size and location of sleeves, inserts, attachments, openings, conduits, ducts, boxes, structural interferences, etc.
 - (2) Contractor shall coordinate these composite Shop Drawings and installation layouts in the field between itself and its Subcontractor(s) for proper relationship to the Work, the work of other trades, and the field conditions. The Contractor shall check and approve all submittal(s) before submitting them for final review.

1.04 PRODUCT DATA OR NON REPRODUCIBLE SUBMITTALS:

- A. Contractor shall submit manufacturer's printed literature in original form. Any fading type of reproduction will not be accepted. Contractor must submit a minimum of six (6) each, to the District. District shall return one (1) to the Contractor, who shall reproduce whatever additional copies it requires for distribution.
- B. Contractor shall submit six (6) copies of a complete list of all major items of mechanical, plumbing, and electrical equipment and materials in accordance with the approved Submittal Schedule, except as required earlier to comply with the approved Construction Schedule. Other items specified are to be submitted prior to commencing Work. Contractor shall submit items of like kind at one time in a neat and orderly manner. Partial lists will not be acceptable.
- C. Submittals shall include manufacturer's specifications, physical dimensions, and ratings of all equipment. Contractor shall furnish performance curves for all pumps and fans. Where printed literature describes items in addition to that item being submitted, submitted item shall be clearly marked on sheet and superfluous information shall be crossed out. If highlighting is used, Contractor shall mark all copies.
- D. Equipment submittals shall be complete and include space requirements, weight, electrical and mechanical requirements, performance data, and supplemental information that may be requested.
- E. Imported Materials Certification must be submitted at least ten (10) days before material is delivered.

1.05 SAMPLES:

- A. Contractor shall submit for approval Samples as required and within the time frame in the Contract Documents. Materials such as concrete, mortar, etc., which require on-site testing will be obtained from Project Site.
- B. Contractor shall submit four (4) samples except where greater or lesser number is specifically required by Contract Documents including, without limitation, the Specifications.

Contractor to review section
01 3300 as well as this
document

- (1) Samples must be of sufficient size and quality to clearly illustrate functional characteristics, with integrally related parts and attachment devices.
 - (2) Samples must show full range of texture, color, and pattern.
- C. Contractor shall make all Submittals, unless it has authorized Subcontractor(s) to submit and Contractor has notified the District in writing to this effect.
- D. Samples to be shipped prepaid or hand-delivered to the District.
- E. Contractor shall mark samples to show name of Project, name of Contractor submitting, Contract number and segment of Work where representative Sample will be used, all applicable Specifications Sections and documents, Contract Drawing Number and detail, and ASTM or FS reference, if applicable.
- F. Contractor shall not deliver any material to Site prior to receipt of District's and/or Architect's completed written review and approval. Contractor shall furnish materials equal in every respect to approved Samples and execute Work in conformance therewith.
- G. District's and/or Architect's review, acceptance, and/or approval of Sample(s) will not preclude rejections of any material upon discovery of defects in same prior to final acceptance of completed Work.
- H. After a material has been approved, no change in brand or make will be permitted.
- I. Contractor shall prepare its Submittal Schedule and submit Samples of materials requiring laboratory tests to specified laboratory for testing not less than ninety (90) days before such materials are required to be used in Work.
- J. Samples which are rejected must be resubmitted promptly after notification of rejection and be marked "Resubmitted Sample" in addition to other information required.
- K. Field Samples and Mock-Ups are to be removed by Contractor at District's direction:
 - (1) Size: As Specified.
 - (2) Furnish catalog numbers and similar data, as requested.

1.06 REVIEW AND RESUBMISSION REQUIREMENTS:

- A. The District will arrange for review of Sample(s), Shop Drawing(s), Product Data, and other submittal(s) by appropriate reviewer and return to Contractor as provided below within twenty-one (21) days after receipt or within twenty-one (21) days after receipt of all related information necessary for such review, whichever is later.
- B. One (1) copy of product or materials data will be returned to Contractor with the review status.

Contractor to review section
01 3300 as well as this
document

- C. Samples to be incorporated into the Work will be returned to Contractor, together with a written notice designating the Sample with the appropriate review status and indicating errors discovered on review, if any. Other Samples will not be returned, but the same notice will be given with respect thereto, and that notice shall be considered a return of the Sample.
- D. Contractor shall revise and resubmit any Sample(s), Shop Drawing(s), Product Data, and other submittal(s) as required by the reviewer. Such resubmittals will be reviewed and returned in the same manner as original Sample(s), Shop Drawing(s), Product Data, and other submittal(s), within fourteen (14) days after receipt thereof or within fourteen (14) days after receipt of all related information necessary for such review. Such resubmittal shall not delay the Work.
- E. Contractor may proceed with any of the Work covered by Sample(s), Shop Drawing(s), Product Data, and other submittal(s) upon its return if designated as no exception taken, or revise as noted, provided the Contractor proceeds in accordance with the District and/or the Architect's notes and comments.
- F. Contractor shall not begin any of the work covered by a Sample(s), Shop Drawing(s), Product Data, and other submittal(s), designated as revise and resubmit or rejected, until a revision or correction thereof has been reviewed and returned to Contractor.
- G. Sample(s), Shop Drawing(s), Product Data, and other submittal(s) designated as revise and resubmit or rejected and requiring resubmittal, shall be revised or corrected and resubmitted to the District no later than fourteen (14) days or a shorter period as required to comply with the approved Construction Schedule, after its return to Contractor.
- H. Neither the review nor the lack of review of any Sample(s), Shop Drawing(s), Product Data, and other submittal(s) shall waive any of the requirements of the Contract Documents, or relieve Contractor of any obligation thereunder.
- I. District's and/or Architect's review of Shop Drawings does not relieve the Contractor of responsibility for any errors that may exist. Contractor is responsible for the dimensions and design of adequate connections and details and for satisfactory construction of all the Work.

PART 2 – PRODUCTS Not Used.

PART 3 - EXECUTION Not Used.

END OF DOCUMENT

McKinley Elementary School - Shade Structures
Tracy Unified School District

SUBMITTAL NO.:

Architect's Project # 3595001

DATE: _____

DSA File/Apl. # XX-XX/XX-XXXXXX

Re-Submittal of Original No.: _____

1. SUBMITTAL TRANSMITTAL

Attention: Affifa Kadhim

Contractor: Company

Contact: Name _____

Sub Contractor:

Contact: _____

HMC
Architects

Please submit only one trade per submittal! Description of submitted materials:

Quantity submitted	Specification Section		Description of contents (e.g. product data, shop drawings, samples)
	Section #	Section Title	

Contractor Statement: (read and acknowledge)

This submittal has been reviewed and approved with respect to the means, methods, techniques, and procedures of construction, safety precautions, and program incidentals thereto. This submittal complies with the contract documents and comprises no variations thereto, unless accompanied by a substitution request.

By: _____
Name

Date: _____

2. RE-TRANSMITTAL TO CONTRACTOR:

Distribution: Contractor, Owner, Project Inspector, RGA, Other

☐ NO EXCEPTIONS TAKEN
☐ SUBMIT SPECIFIED ITEM

☐ REJECTED
☐ REVISE AND RESUBMIT

☐ FURNISH AS CORRECTED
☐ NO ACTION REQUIRED

Corrections or comments made on the shop drawings during this review do not relieve the Contractor from compliance with requirements of the Drawings and Specifications. This general check is only for the review of conformance with the design concept of the project and general compliance with the information given in the Contract Documents. The Contractor is responsible for confirming and correlating all quantities and dimensions, selecting fabrication processes and techniques of construction, coordinating his work with that of all the other trades, and performing his work in a safe and satisfactory manner.

HMC ARCHITECTS

By: _____ Date: _____

Additional Comments:

See Specification Section 01 3300 for use of this form

McKinley Elementary School - Shade Structures
Tracy Unified School District

**SUBSTITUTION
REQUEST NO.:**

Architect's Project # 3595001
DSA File/Appl. # XX-XX/XX-XXXXXX

Date: _____

1. SUBSTITUTION REQUEST

Attention: Affifa Kadhim

Contractor: Company _____

Contact: Name _____

HMC
Architects

Please submit only one product per request!

Sub Contractor: _____

Include with a specified product Submittal

Contact: _____

2. PROPOSED SUBSTITUTIONS: The undersigned requests consideration of the following substitution:

Specified Item: _____ Page No.: _____ Paragraph No.: _____

Proposed Item: _____

3. REASON FOR REQUEST:

4. REQUIREMENTS FOR SUBSTITUTIONS:

Attached data includes product description, specifications, drawings, photographs, performance and test data adequate for evaluation of request; applicable portions of data are clearly identified. Attached data also includes a description of changes to Contract Documents, which proposed substitution will require for its proper installation.

The undersigned certifies that the following paragraphs, unless modified by attachments, are correct:

1. The proposed substitution does not affect dimensions shown on drawings and does not require design changes in the Contract Documents.
2. The undersigned will pay for changes to the building design, including engineering design, detailing and construction costs caused by the requested substitution.
3. The proposed substitution will have no adverse effect on the work, the schedule or specified warranty requirements.
4. Maintenance and service parts will be readily available for the proposed substitution.

The undersigned further states that the function, appearance and quality of the proposed substitution are equivalent or superior to the specified item.

Signature - Contractor/Subcontractor

Date

5. TRANSMITTAL TO CONTRACTOR:

Distribution: Contractor, Owner, Project Inspector, RGA, Other

☐ ACCEPTED

☐ ACCEPTED AS NOTED

☐ REJECTED

HMC ARCHITECTS

By: _____

Date: _____

Comments:

McKinley Elementary School - Shade Structures
Tracy Unified School District

RFI NO.:

Architect's Project # 3595001
DSA File/Apl. # XX-XX/XX-XXXXXX

Date: _____

1. REQUEST FOR INFORMATION

Attention: Affifa Kadhim

From:

Contractor:

Company _____

Contact:

Name _____

Sub Contractor:

Contact:

HMC
Architects

Identify related specific references within the Contract Documents and supporting information:

Dwg./Document No.: _____

Building/Site Location: _____

2. Existing Condition (source / reason for the request):

3. Recommended Contractor Action(s) for resolution:

4. Project Inspector Acknowledgment:

Date Reviewed: _____

5. Owner / A/E Resolution(s):

Date of Response: _____ By: _____

Attachments: _____

Extra Work Involved in the Above Described Change?

Yes ☐

No ☐

Distribution: Contractor, Owner, Project Inspector, HMC, Other
See Specification Section 01300 for use of this form

HMC, Other

McKinley Elementary School - Shade Structures
Tracy Unified School District

**E-DATA
REQUEST NO.:**

Architect's Project # 3595001
DSA File/Appl. # XX-XX/XX-XXXXXX

Date: _____

1. ELECTRONIC DATA REQUEST

Attention: Affifa Kadhim

From: Contractor: Company

Contact: Name

Sub Contractor:

Contact: _____

HMC
Architects

2. DATA REQUESTED - Provide list of specific drawings requested (include sheet numbers):

3. REASON FOR REQUEST - Provide clear explanation of why information is desired and for what purpose it will be utilized:

4. ACKNOWLEDGEMENT OF RESPONSIBILITY:

The electronic data files requested are distributed for reference only. Transferring such files can alter, delete or change original information. Accuracy of the data cannot be guaranteed as correct or complete and the Contractor accepts full responsibility for any and all inaccuracies, regardless of cause.

The hard copy documents, including addenda and subsequent written changes to the documents, represent the complete work of the contract and all electronic files should be cross-referenced and verified from that information as electronic files may not contain all contract information. It is the Contractor's responsibility to make any changes or revisions necessary.

This electronic data is furnished without guarantee of compatibility with your hardware or software. It is the Contractor's responsibility to notify the Architect in the event a compatibility problem or disk defect is encountered and a replacement disk is necessary.

This electronic data, in its present form, remains the property of HMC Architects and shall not be used for any other purpose than to provide background information for the project noted above. It is not to be released to any other party without the written consent of HMC Architects.

Accepted by: _____
Signature - Contractor/Subcontractor

Representing: _____
Contractor/Subcontractor Company Name

MEGGER GROUNDING TEST CERTIFICATE

This certifies that a Megger Grounding Test for the _____ **[name of project]** _____ for the _____ **[name of District]** _____ School District, of _____ **[name of county]** _____ County, California was conducted on the _____ day of _____, **[year]**, per CCR Title 24, Sections 200 H and J. The undersigned verifies that the resistance to ground was 25 ohms or less, as required, and is found to be acceptable.

Project Name: _____

DSA File No.: _____ DSA Application No.: _____

Address: _____

General Contractor's Signature: _____

Electrical Contractor's Signature: _____

Testing Agency's Signature: _____

District Inspector's Signature: _____

SEPARATE CERTIFICATE IS REQUIRED FOR EACH SITE

CERTIFICATION OF CHLORINATION AND STERILIZATION

This certifies that _____ chlorinated the domestic hot and cold water plumbing lines for the **[name of project]**, **[name of district]** School District. The lines were first flushed and chlorine was injected in the main water line on _____, **[year]**. A minimum chlorine residual of 50 ppm was measured at each outlet. The lines were tagged, secured and the make-up water was shut off. On _____, **[year]**, (a minimum of 24 hours later) the chlorine residual was retested and found to contain a minimum of 50 ppm. The plumbing lines were then thoroughly flushed with fresh water until the chlorine residual was not greater than 0.2 ppm at all outlets. A Bacteriological Examination report has been provided.

District Inspector Signature: _____

Date _____

Name of Chlorination and Testing Firm: _____

Authorized Representative Signature: _____

Date _____

Name of General Contractor: _____

Authorized Representative Signature: _____

Date _____

CERTIFICATION OF COMPLIANCE FOR BUILDING MATERIALS

This is to certify, in accordance with the Environmental Protection Agency requirements, that the materials and equipment used in the construction of the [project name] for the [district name] School District of [name of county] County, California, are asbestos free and are, therefore, not subject to monitoring for asbestos contamination.

Project Name: _____

Address: _____

Contractor: _____

Address: _____

Signature: _____

Title: _____

Date: _____

SEPARATE CERTIFICATE IS REQUIRED FOR EACH SITE

ROOFING CERTIFICATION

This is to certify that a representative of the manufacturer has visited the site prior to installation, inspected the surfaces which the roofing is applied and accepted those surfaces.

In addition, a representative of the manufacturer has inspected the materials and methods used, verified they are in accordance with the manufacturer's recommendations, and accepts the final installation.

A guarantee for materials and workmanship is to be provided separately.

Project name: _____

Address: _____

General Contractor: _____

Roofing Contractor: _____

Scope of Work/Roofing Type: _____

Roofing Manufacturer: _____

Manufacturer's Representative: _____

Representative's Signature: _____

Date: _____

A SEPARATE CERTIFICATE IS REQUIRED FOR EACH SITE
AND FOR EACH ROOFING TYPE

SITE STANDARDS

PART 1 – GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including without limitation, Site Access, Conditions, and Regulations;
- B. Special Conditions;
- C. Drug-Free Workplace Certification;
- D. Tobacco-Free Environment Certification;
- E. Criminal Background Investigation/Fingerprinting Certification;
- F. Temporary Facilities and Controls.

1.02 REQUIREMENTS OF THE DISTRICT:

- A. Drug-Free Schools and Safety Requirements:
 - (1) All school sites and other District Facilities have been declared "Drug-Free Zones." No drugs, alcohol and/or smoking are allowed at any time in any buildings and/or grounds on District property. No students, staff, visitors, or contractors are to use drugs on these sites.
 - (2) Smoking and the use of tobacco products by all persons is prohibited on or in District property. District property includes school buildings, school grounds, school-owned vehicles and vehicles owned by others while on District property. Contractor shall post: "Non-Smoking Area" in a highly visible location in each work area, staging area, and parking area. Contractor may designate a smoking area outside of District property within the public right-of-way, provided that this area remains quiet and unobtrusive to adjacent neighbors. This smoking area is to be kept clean at all times.
 - (3) Contractor shall ensure that no alcohol, firearms, weapons, or controlled substances enter or are used at the Site. Contractor shall immediately remove from the Site and terminate the employment of any employee(s) found in violation of this provision.
- B. Language: Profanity or other unacceptable and/or loud language will not be tolerated, "Cat calls" or other derogatory language toward students, staff, volunteers, parents or public will not be allowed.

C. Disturbing the Peace (Noise and Lighting):

- (1) Contractor shall observe the noise ordinance of the Site at all times including, without limitation, all applicable local, city, and/or state laws, ordinances, and/or regulations regarding noise and allowable noise levels.
- (2) The use of radios, etc., shall be controlled to keep all sound at a level that cannot be heard beyond the immediate area of use. District reserves the right to prohibit the use of radios at the Site, except for mobile phones or other handheld communication radios.
- (3) If portable lights are used after dark, all light must be located so as not to direct light into neighboring property.

D. Traffic:

- (1) Driving on the Premises shall be limited to periods when students and public are not present. If driving or deliveries must be made during the school hours, two (2) or more ground guides shall lead the vehicle across the area of travel. In no case shall driving take place across playgrounds or other pedestrian paths during recess, lunch, and/or class period changes. The speed limit on-the Premises shall be five (5) miles per hour (maximum) or less if conditions require.
- (2) All paths of travel for deliveries, including without limitation, material, equipment, and supply deliveries, shall be reviewed and approved by District in advance. Any damage will be repaired to the pre-damaged condition by the Contractor.
- (3) District shall designate a construction entry to the Site. If Contractor requests, District determines it is required, and to the extent possible, District shall designate a staging area so as not to interfere with the normal functioning of school facilities. Location of gates and fencing shall be approved in advance with District and at Contractor's expense.
- (4) Parking areas shall be reviewed and approved by District in advance. No parking is to occur under the drip line of trees or in softscape areas that could otherwise be damaged.

- E. All of the above shall be observed and complied with by the Contractor and all workers on the Site. Failure to follow these directives could result in individual(s) being suspended or removed from the work force at the discretion of the District. The same rules and regulations shall apply equally to delivery personnel, inspectors, consultants, and other visitors to the Site.

PART 2 - PRODUCTS Not Used.

PART 3 - EXECUTION Not Used.

END OF DOCUMENT

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Alteration requirements for modernizations, remodels, and additions.

1.2 RELATED REQUIREMENTS

- A. Section 01 1100, Summary of Work.
- B. Section 01 5000, Temporary Facilities and Controls.
- C. Section 01 7329, Cutting and Patching.

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CALGreen), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Coordination:
 - 1. Contractor to coordinate and conduct a meeting with the demolition contractor to verify which systems, if any, are to be protected and maintained. Such systems shall be clearly identified and marked to avoid unnecessary damage or removal.
 - 2. Coordinate work of alterations and renovations to expedite completion sequentially and to accommodate Owner occupancy.

1.5 QUALITY ASSURANCE

- A. Manufacturer and Installer Qualifications: As specified in the product specifications.
- B. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.
- C. Single Source Responsibility: Use materials and products of one manufacturer whenever possible.
- D. All materials, components, assemblies, workmanship and installation are to be observed by the Owner's Inspector of Record. Work not so inspected is subject to uncovering and replacement.

ALTERATION PROJECT PROCEDURES
SECTION 01 3516
3595001

1.6 FIELD CONDITIONS

- A. Make and be responsible for all field dimensions necessary for proper fitting and completion of work. Report discrepancies to Architect before proceeding.

PART 2 - PRODUCTS

2.1 PRODUCTS FOR PATCHING AND EXTENDING WORK

- A. New Materials: As specified in product Sections; match existing products and work for patching and extending work.
- B. Type and Quality of Existing Products: Determine by inspection and testing products where necessary, referring to existing work as a standard.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that demolition is complete and areas are ready for installation of new work.
- B. Inspect conditions of uncovered work affecting installation of products or performance work.
- C. Verify that specified items may be installed in accordance with the approved design.
- D. Beginning of restoration work means acceptance of existing conditions.
- E. In event of discrepancy, immediately notify Architect. Do not proceed in discrepant areas until discrepancies have been fully resolved.

3.2 PREPARATION

- A. Close openings in exterior surfaces to protect existing work and salvage items for weather and extremes of temperature and humidity. Insulate ductwork and piping to prevent condensation in exposed areas.
- B. Cut, move or remove items as necessary for access to alterations and renovation work.
- C. Remove debris and abandoned items from area and from concealed spaces.
- D. Remove unsuitable material not marked for salvage, such as rotted wood, corroded metals, and deteriorated masonry and concrete.
- E. Prepare surface, and remove surface finishes to provide for proper installation of new work and finishes including blocking, framing, insulation, etc.
- F. Replace materials as specified for finished work.

3.3 INSTALLATION

- A. Complete Project in all respects.
- B. Remove, cut and patch work in a manner to minimize damage and to provide a means of restoring products and finishes to original condition, and installation of concealed work, as specified in Section 01 7329, Cutting and Patching,
- C. Install products as specified in individual specifications Sections.
- D. Where materials or equipment are removed, but no new finish is scheduled, patch and repair any damage to match existing wall surface.

3.4 TRANSITIONS

- A. Where new work abuts or aligns with existing, perform a smooth and even transition. Patched work is to match existing adjacent work in texture and appearance.
- B. When finished surfaces are cut so that a smooth transition with new work is not possible, terminate existing surface along a straight line at a natural point of division and make recommendation to Architect.

3.5 ADJUSTMENTS

- A. Where removal of partitions or walls results in adjacent spaces becoming one, rework floors, walls and ceilings to a smooth plane without breaks, steps or bulkheads.
- B. Where a change of plane of 1/8" or more occurs, submit recommendation for providing a smooth transition for Architect review.
- C. Fit work at penetrations of surfaces as specified in Section 01 7329.

3.6 FINISHES

- A. Finish surfaces as specified in individual Product Sections.
- B. Finish patches to produce uniform finish and texture over entire area. When finish cannot be matched, refinish entire surface to nearest intersections.

3.7 REPAIR OF DAMAGED SURFACES

- A. Patch or replace portions of existing surfaces which are damaged, lifted, discolored, or showing other imperfections.
- B. Repair substrate prior to patching finish.
- C. In the event of damage, make all repairs and replacements necessary to the approval of the Architect at no additional cost to the Owner.

ALTERATION PROJECT PROCEDURES
SECTION 01 3516
3595001

3.8 CLEANING

- A. Upon completion of installation, remove manufacturer's temporary labels and marks of identification. Thoroughly clean surfaces and remove foreign material. Leave entire work in neat, orderly, clean and acceptable condition.

3.9 PROTECTION

- A. Protect work and materials of this Section prior to and during installation, and protect the installed work and materials of other trades.
- B. Exposed finishes shall be free from scratches, dents, permanent discolorations and other defects in workmanship or material.

END OF SECTION

*p:\sacramento\3595 tracy unified school district\001-000_villalovoz es new shade structures\08 specifications\06 spec\04 final\freiler
- shade struct\01 3516 _alteration project procedures.docx
Last Updated: December 16, 2021*

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Special environmental, sustainable, and “green” building practices related to indoor air quality, resource efficiency supplementing the Pollutant Control requirements specified under Section 01 8113.10, Sustainable Design Requirements, and to ensure healthy indoor air quality in final Project.
- B. Contractor is required to comply with sustainable building practices during construction and when considering materials for substitutions. Refer to Article “Design Requirements.”

1.2 RELATED REQUIREMENTS

- A. Section 01 6116, Volatile Organic Compound (VOC) Restrictions.
- B. Section 01 7419, Construction Waste Management and Disposal.
- C. Section 01 8113, Sustainable Design Requirements.

1.3 ADMINISTRATIVE REQUIREMENTS

- A. Submittal Procedures:
 - 1. Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
 - 2. Sustainable Design Submittals shall comply with the additional requirement of Section 01 8113, Sustainable Design Requirements.
 - 3. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.

1.4 DESIGN REQUIREMENTS

- A. Owner has established general environmental goals for design and for construction of the Project.
 - 1. In addition to the Contractor, the Contractor’s construction team, including subcontractors, suppliers, and manufacturers, are encouraged to participate where possible to realize the Owner’s environmental goals.
 - 2. Intent is for environmental goals to be achieved in a manner which ultimately provides a safe and healthy environment for building occupants with minimal impact on the local, regional and global environment.
- B. Environmental Goals:
 - 1. Refer to specific Specifications Sections for more detailed construction requirements related to specific materials and systems.

ENVIRONMENTAL PROCEDURES
SECTION 01 3543
3595001

1.5 INFORMATIONAL SUBMITTALS

A. Indoor Air Quality (IAQ) Data:

1. Environmental Issues: Submit emission test data produced by acceptable testing laboratory, listed in this Specification Article "Quality Assurance," for materials as required in each specific Specification Section.
 - a. Laboratory reports shall contain emissions test data on Volatile Organic Compounds (VOCs) including Total Volatile Organic Compounds (TVOC), specific individual VOCs, formaldehyde and other aldehydes as described in this Section.
 - b. Identify VOCs emitted by each material as required in these Specifications, and demonstrate compliance with the California Green Building Standards Code, edition current as of the date of this Contract.
 - c. Specific test conditions and requirements are set forth in the Specifications. For required tests, submit documentation of sample acquisition, handling, and test specimen preparation, as well as test conditions, methods, and procedures. The tests consist of a 10-day conditioning period followed by a 96-hour test period.
 - 1) Samples collected during the test period at 24, 48, and 96-hours shall be analyzed for TVOC and formaldehyde.
 - 2) VOC samples collected at 96 hours shall be identified and quantified for compounds that are found on the list of Chemicals of Concern. The Chemicals of Concern list is based on the California OEHHA list as of September 2002 (The most recent list shall be used for this Specification as published at:
 - a) http://www.oehha.org/air/chronic_rels/allChrels.html.
2. Cleaning and Maintenance Products: Provide data on manufacturers' recommended maintenance, cleaning, refinishing and disposal procedures for materials and products. These procedures are for final Contractor cleaning of the project prior to Substantial Completion and for provided materials and products as required by the specific Specification Sections.
 - a. Where chemical products are recommended for these procedures, provide documentation to indicate that no component present in the cleaning product at more than 1 percent of the total mass of the cleaning product is a carcinogen or reproductive toxicant as identified in the Chemicals of Concern list referenced above.
 - b. Avoid cleaning products containing alpha-pinene, d-limonene or other unsaturated carbon double bond alkenes due to chemical reactions with ozone to form aldehydes, acidic aerosols, and ultra-fine particulate matter in indoor air.

B. Certificates:

1. Prior to Final Completion, submit a certificate signed by corporate office holder of Contractor, subcontractor, supplier, vendor, installer or manufacturer primarily responsible for the manufacturing of the product, indicating materials provided are

essentially the same, and contain essentially the same components as products and materials tested.

2. Comply with requirements specified in Specification Section 01 7700, Closeout Procedures.

1.6 CLOSEOUT SUBMITTALS

- A. Submit data relating to Environmental Issues.
 1. Submit environmental product certifications, in two forms:
 - a. Two CD-ROMs organized by CSI Division Format.
 - b. Three three-ring binders organized by CSI Division Format with Table of Contents and with dividers for each Division.

1.7 QUALITY ASSURANCE

- A. Environmental Project Management and Coordination: Contractor to identify one person on Contractor's staff to be responsible for environmental issues compliance and coordination.
 1. Experience: Environmental project manager shall have experience relating to sustainable building construction.
 2. Responsibilities: Carefully review the Contract Documents for environmental issues, coordinate work of trades, subcontractors, and suppliers; instruct workers relating to environmental issues; and oversee Project Environmental Goals.
 3. Meetings: Discuss Environmental Goals at following meetings.
 - a. Pre-construction meeting.
 - b. Pre-installation meetings.
 - c. Regularly scheduled job-site meetings.
 - d. Special sustainability issues meetings.
- B. Environmental Issues Criteria: Comply with requirements listed in the Specification Sections.
- C. Acceptable Indoor Air Emissions Testing Laboratories:
 1. Selection of testing laboratories shall include assessment of prior experience in conducting indoor source emissions tests.
 2. The proposed laboratory shall be an independent company or organization not related to the manufacturer of the products to be tested.
 3. Submit documentation on proposed laboratory for review and approval by Owner.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Packaging: Deliver materials in recyclable or in reusable packaging such as cardboard, wood, paper, or reusable blankets, which will be reclaimed by supplier or manufacturer for recycling.

ENVIRONMENTAL PROCEDURES

SECTION 01 3543

3595001

1. Minimize packaging materials to maximum extent possible while still ensuring protection of materials during delivery, storage, and handling.
 2. Unacceptable Packaging Materials: Polyurethane, polyisocyanate, polystyrene, polyethylene, and similar plastic materials such as “foam” plastics and “shrink-fit” plastics.
 3. Reusable Blankets: Deliver and store materials in reusable blankets and mats reclaimed by the manufacturers or suppliers for reuse where the reclamation program exists or where a program can be developed for such reuse.
 4. Pallets: Where pallets are used, suppliers shall be responsible to ensure pallets are removed from site for reuse or for recycling.
 5. Corrugated Cardboard and Paper: Where paper products are used, recycle as part of the construction waste management recycling program, or return to the material’s manufacturer for use by the manufacturer or supplier.
 6. Sealants, Paint, Primers, Adhesives, and Coating Containers: Return to the supplier or manufacturer for reuse where such program is available.
- B. Comply with the additional requirements specified in Section 01 7419, Construction Waste Management and Disposal.

1.9 FIELD CONDITIONS

- A. No smoking will be permitted in indoor Project site locations, in accordance with California Labor Code (Section 400-6413.5).
- B. Environmental Product Certification:
1. Include certification that indicates cleaning materials comply with requirements of these Specifications.
- C. Construction Ventilation and Preconditioning:
1. Temporary Construction Ventilation: Maintain sufficient temporary ventilation of areas where materials are being used that emit VOCs. Maintain ventilation continuously during installation, and until emissions dissipate following installation. If continuous ventilation is not possible utilizing the building’s HVAC system(s) then ventilation shall be supplied using open windows and temporary fans, sufficient to provide no less than three air changes per hour.
 - a. Period after installation shall be sufficient to dissipate odors and elevated concentrations of VOCs. Where no specific period is stated in these Specifications, a time period of 72 hours shall be used.
 - b. Ventilate areas directly to outside; ventilation to other enclosed areas is not acceptable.
 2. During dust producing activities, including drywall installation and finishing, turn ventilation system off, and openings in supply and return HVAC system shall be protected from dust infiltration. Provide temporary ventilation as required.
 3. Preconditioning: Prior to installation, allow products which have odors and significant VOC emissions to off-gas in dry, well-ventilated space for 14 calendar days to allow for reasonable dissipation of odors and emissions prior to delivery to Project site and installation.

- a. Condition products without containers and packaging to maximize off-gassing of VOCs
 - b. Condition products in ventilated warehouse or other building. Comply with substitution requirements for consideration of other locations.
- D. Protection:
 - 1. Moisture Stains: Materials with evidence of moisture damage, including stains, are not acceptable, including both stored and installed materials; immediately remove from site and properly dispose.
 - a. Take special care to prevent an accumulation of moisture on installed materials and within packaging during delivery, storage, and handling to prevent development of molds and mildew on packaging and on products
 - b. Immediately remove from site and properly dispose of materials showing signs of mold and signs of mildew, including materials with moisture stains.
 - c. Replace moldy materials with new, undamaged materials.
 - 2. Ducts: Seal ducts during transportation, delivery, and construction to prevent accumulation of construction dust and construction debris inside of ducts.

PART 2 - PRODUCTS

2.1 SUBSTITUTIONS

- A. Requests for substitutions shall comply with requirements specified in Specification Section 01 3300, Submittals, and with the following additional information required where environmental issues are specified:
 - 1. Indicate how each proposed substitution complies with requirements for VOCs.
 - 2. Owner, in consultation with Architect reserve the right to reject proposed substitutions where data for VOCs is not provided or where emissions of individual VOCs are higher than for the specified materials.
 - 3. Comply with the specified recycled content and other environmental requirements.

PART 3 - EXECUTION

3.1 FIELD QUALITY CONTROL

- A. Sequencing:
 - 1. On-Site Application: Where odorous and/or high VOC emitting products are applied on-site, apply prior to installation of porous and fibrous materials. Where this is not possible, protect porous materials with polyethylene vapor retarders.
 - 2. Complete interior finish material installation no less than 14 days prior to Substantial Completion to allow for Building Flush Out as described in Paragraph 3.1B.

ENVIRONMENTAL PROCEDURES

SECTION 01 3543

3595001

- B. Building Flush Out: Just prior to Substantial Completion, flush out building air continuously using maximum tempered outside air, or maximum amount of outside air while achieving reasonable indoor temperature, for at least 14 calendar days. Continuously is defined as 24 hours per day, 7 days a week. If interruptions of more than a few hours are required for testing and balancing purposes, extend flush out period accordingly in order to achieve the minimum 14 calendar day building flush out period.
 - 1. When Contractor is required to perform touch-up work, provide temporary construction ventilation during installation and extend building flush-out by a minimum of 4 calendar days after touch-up installation is complete with maximum tempered outside air for 24 hours per day.
 - 2. If construction schedule permits, extend flush-out period beyond minimum building flush out period for an additional 15 days.
 - 3. Return ventilation system to normal operation following flush-out period to minimize energy consumption.

3.2 CLEANING

- A. Clean interior and exterior surfaces exposed to view; remove temporary labels, stains, and foreign substances; polish transparent and glossy surfaces using cleaning and maintenance products that conform to standards as described in Part 1 of this Section.
- B. Clean equipment and fixtures to sanitary condition using cleaning and maintenance products that conform to standards as described in Part 1 of this Section.
- C. Products used for cleaning shall comply with Proposition 65 and the additional restrictions for volatile organic compounds specified in Section 01 6116.
- D. Vacuum carpeted and soft surfaces with high efficiency particulate arrestor (HEPA) vacuum.
- E. If ducts were not sealed during construction, and contain dust or dirt, clean ducts using HEPA vacuum immediately prior to Substantial Completion and prior to using ducts to circulate air. Oil film on sheet metal shall be removed before shipment to site. Ducts shall be inspected to confirm that no oil film is present. Remove oil film.
- F. Replace air filters, both pre and final filters, just prior to Substantial Completion.
- G. Remove and properly dispose of recyclable materials using construction waste management program described in Section 01 7419, Construction Waste Management and Disposal.

3.3 PROTECTION

- A. Protect interior materials from water intrusion or penetration where interior products are not intended for wet applications and are exposed to moisture.
- B. Protect installed products using methods that do not support growth of mold and mildew.

ENVIRONMENTAL PROCEDURES
SECTION 01 3543
3595001

1. Immediately remove from site materials with mold or mildew.

END OF SECTION

*p:\sacramento\3595 tracy unified school district\001-000_villalovoz es new shade structures\08 specifications\06 spec\04 final\freiler
- shade struct\01 3543_environmental procedures.docx*

REGULATORY REQUIREMENTS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Obtaining of Permits, Licenses and Registrations and Work to Comply with All Applicable Laws and Regulations;
- B. Special Conditions; and
- C. Quality Control.

1.02 DESCRIPTION:

This section covers the general requirements for regulatory requirements pertaining to the Work and is supplementary to all other regulatory requirements mentioned or referenced elsewhere in the Contract Documents.

1.03 REQUIREMENTS OF REGULATORY AGENCIES:

- A. All statutes, ordinances, laws, rules, codes, regulations, standards, and the lawful orders of all public authorities having jurisdiction over the Work, are hereby incorporated into these Contract Documents as if repeated in full herein and are intended to be included in any reference to Code or Building Code, unless otherwise specified, including, without limitation, the references in the list below. Contractor shall make available at the Site copies of all the listed documents applicable to the Work as the District and/or Architect may request, including, without limitation, applicable portions of the California Code of Regulations ("CCR").
 - (1) California Building Standards Administrative Code, Part 1, Title 24, CCR.
 - (2) California Building Code (CBC), Part 2, Title 24, CCR; (International Building Code volumes 1-2 and California Amendments).
 - (3) California Electrical Code (CEC), Part 3, Title 24, CCR; (National Electrical Code and California Amendments).
 - (4) California Mechanical Code (CMC), Part 4, Title 24, CCR; (Uniform Mechanical Code and California Amendments).
 - (5) California Plumbing Code (CPC), Part 5, Title 24, CCR; (Uniform Plumbing Code and California Amendments).

- (6) California Fire Code (CFC), Part 9, Title 24, CCR; (International Fire Code and California Amendments).
- (7) California Green Building Standards Code (CALGreen), Part 11, Title 24, CCR.
- (8) California Referenced Standards Code, Part 12, Title 24, CCR.
- (9) State Fire Marshal Regulations, Public Safety, Title 19, CCR.
- (10) Partial List of Applicable National Fire Protection Association (NFPA) Standards:
 - (a) NFPA 13 - Automatic Sprinkler System.
 - (b) NFPA 14 - Standpipes Systems.
 - (c) NFPA 17A - Wet Chemical System
 - (d) NFPA 24 - Private Fire Mains.
 - (e) (California Amended) NFPA 72 - National Fire Alarm Codes.
 - (f) NFPA 253 - Critical Radiant Flux of Floor Covering System.
 - (g) NFPA 2001 - Clean Agent Fire Extinguishing Systems.
- (11) California Division of the State Architect interpretation of Regulations ("DSA IR"), including, without limitation:
 - (a) DSA IR A-6 — Construction Change Document Submittal and Approval Processes.
 - (b) DSA IR A-7 — Project Inspector Certification and Approval.
 - (c) DSA IR A-8 — Project Inspector and Assistant Inspector Duties and Performance.
 - (d) DSA IR A-12 — Assistant Inspector Approval.
- (12) DSA Procedures ("DSA PR")
 - (a) DSA PR 13-01 – Construction Oversight Process
 - (b) DSA PR 13-02 – Project Certification Process

B. This Project shall be governed by applicable regulations, including, without limitation, the State of California's Administrative Regulations for the Division of the State Architect-Structural Safety (DSA/SS), Chapter 4, Part 1, Title 24, CCR, and the most current version on the date the bids are opened and as it pertains to school construction including, without limitation:

- (1) Test and testing laboratory per Section 4-335. District shall pay for the testing laboratory.
- (2) Special inspections per Section 4-333(c).
- (3) Deferred Approvals per section 4-317(g).
- (4) Verified reports per Sections 4-336 & 4-343(c).
- (5) Duties of the Architect & Engineers shall be per Sections 4-333(a) and 4-341.
- (6) Duties of the Contractor shall be per Section 4-343.
- (7) Duties of Project Inspector shall be per Section 4-334.
- (8) Addenda and Construction Change Documents per Section 4-338.

Contractor shall keep and make available all applicable parts of the most current version of Title 24 referred to in the plans and specifications at the Site during construction.

C. Items of deferred approval shall be clearly marked on the first sheet of the Architect's and/or Engineer's approved Drawings. All items later submitted for approval shall be per Title 24 requirements to the DSA.

- (1) Contractor shall submit the following to Architect for review and endorsement:
 - (a) Product information on proposed material/system supplier.
 - (b) Drawings, specifications, and calculations prepared, signed, and stamped by an architect or engineer licensed in the State of California for that portion of the Work.
 - (c) All other requirements as may be required by DSA.
- (2) Cost of preparing and submitting documentation per DSA Deferred Approval requirements including required modifications to Drawings and Specifications, whether or not indicated in the Contract Documents, shall be borne by Contractor.
- (3) Contractor shall not begin fabrication and installation of deferred approval items without first obtaining DSA approval of Drawings and Specifications.
- (4) Schedule of Work Subject to DSA Deferred Approval: Window wall systems exceeding 10 feet in span.

PART 2 – PRODUCTS Not Used.

PART 3 – EXECUTION Not Used.

END OF DOCUMENT

ABBREVIATIONS AND ACRONYMS

PART 1 – GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions including without limitation, Definitions;
- B. Special Conditions.

1.02 DOCUMENT INCLUDES:

- A. Abbreviations used throughout the Contract Documents.
- B. Reference to a technical society, organization, or body is by abbreviation, as follows:

1.	AA	The Aluminum Association
2.	AASHTO	American Association of State Highway and Transportation Officials
3.	ABPA	Acoustical and Board Products Association
4.	ACI	American Concrete Institute
5.	AGA	American Gas Association
6.	AGC	Associated General Contractors of America
7.	AHC	Architectural Hardware Consultant
8.	AHRI	Air Conditioning, Heating, Refrigeration Institute
9.	AI	Asphalt Institute
10.	AIA	American Institute of Architects
11.	AISC	American Institute of Steel Construction
12.	AISI	American Iron and Steel Institute
13.	AMCA	Air Movement and Control Association
14.	ANSI	American National Standards Institute
15.	APA	APA – The Engineered Wood Association
16.	ASCE	American Society of Civil Engineers
17.	ASHRAE	American Society of Heating, Refrigeration and Air Conditioning Engineers
18.	ASME	American Society of Mechanical Engineers
19.	ASTM	American Society of Testing and Materials International
20.	AWPA	American Wood Protection Association
21.	AWPI	American Wood Preservers Institute
22.	AWS	American Welding Society
23.	AWSC	American Welding Society Code
24.	AWI	Architectural Woodwork Institute
25.	AWWA	American Water Works Association
26.	BIA	The Brick Industry Association

27.	CCR	California Code of Regulations
28.	CLFMI	Chain Link Fence Manufacturers Institute
29.	CRA	California Redwood Association
30.	CRSI	Concrete Reinforcing Steel Institute
31.	CS	Commercial Standards
32.	CSI	Construction Specifications Institute
33.	CTI	Cooling Technology Institute
34.	FGIA	Fenestration and Glazing Industry Alliance
35.	FGMA	Flat Glass Manufacturers' Association
36.	FIA	Factory Insurance Association
37.	FM	Factory Mutual Global
38.	FS/FED SPEC	Federal Specification
39.	FTI	Facing Title Institute
40.	GA	Gypsum Association
41.	IAPMO	International Association of Plumbing and Mechanical Officials
42.	ICC	International Code Council
43.	IEEE	Institute of Electrical and Electronics Engineers
44.	IES	Illuminating Engineering Society
45.	MCAC	Mason Contractors Association of California
46.	MIMA	Mineral Wool Insulation Manufacturers Association
47.	MLMA	Metal Lath Manufacturers Association
48.	MS/MIL SPEC	Military Specifications
49.	NAAMM	National Association of Architectural Metal Manufacturers
50.	NBHA	National Builders Hardware Association
51.	NCMA	National Concrete Masonry Association
52.	NCSEA	National Council of Structural Engineers Associations
53.	NEC	National Electrical Code
54.	NEMA	National Electrical Manufacturers Association
55.	NIST	National Institute of Standards and Technology
56.	NSI	Natural Stone Institute
57.	NTMA	National Terrazzo and Mosaic Association, Inc.
58.	ORS	Office of Regulatory Services (California)
59.	OSHA	Occupational Safety and Health Act
60.	PCI	Precast/Prestressed Concrete Institute
61.	PCA	Portland Cement Association
62.	PCA	Painting Contractors Association
63.	PDI	Plumbing Drainage Institute
64.	PEI	Porcelain Enamel Institute, Inc.
65.	PG&E	Pacific Gas & Electric Company
66.	PS	Product Standards
67.	SDI	Steel Door Institute; Steel Deck Institute
68.	SJI	Steel Joist Institute
69.	SSPC	Society for Protective Coatings
70.	TCNA	Tile Council of North America, Inc.
71.	TPI	Truss Plate Institute
72.	UBC	Uniform Building Code
73.	UL	Underwriters Laboratories Code

74.	UMC	Uniform Mechanical Code
75.	USDA	United States Department of Agriculture
76.	VI	Vermiculite Institute
77.	WCLIB	West Coast Lumber Inspection Bureau
78.	WDMA	Window and Door Manufacturers Association
79.	WEUSER	Western Electric Utilities Service Engineering Requirements
80.	WIC	Woodwork Institute of California

PART 2 - PRODUCTS Not Used.

PART 3 - EXECUTION Not Used.

END OF DOCUMENT

DEFINITIONS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions including without limitation, Definitions;
- B. Special Conditions.

1.02 QUALITY ASSURANCE

- A. For products or workmanship specified by association, trade, or Federal Standards, Contractor shall comply with requirements of the standard, except when more rigid requirements are specified in the Contract Documents, or are required by applicable codes.
- B. Contractor shall conform to current reference standard publication date in effect on the date of bid opening.
- C. Contractor shall obtain copies of standards unless specifically required not to by the Contract Documents.
- D. Contractor shall maintain a copy of all standards at jobsite during submittals, planning, and progress of the specific Work, until final completion, unless specifically required not to by the Contract Documents.
- E. Should specified reference standards conflict with Contract Documents, Contractor shall request clarification from the District and/or the Architect before proceeding.
- F. The contractual relationship of the parties to the Contract shall not be altered from the contractual relationship as indicated in the Contract Documents by mention or inference otherwise in any referenced document.
- G. Governing Codes shall be as shown in the Contract Documents including, without limitation, the Specifications.

END OF DOCUMENT

REFERENCES**PART 1 - GENERAL****1.01 SCHEDULE OF REFERENCES:**

The following information is intended only for the general assistance of the Contractor, and the District does not represent that all of the information is current. It is the Contractor's responsibility to verify the correct information for each of the entities listed.

AA	The Aluminum Association 1400 Crystal Drive, Suite 430 Arlington, VA 22202 www.aluminum.org	703/358-2960
AABC	Associated Air Balance Council 2401 Pennsylvania Avenue NW, Suite 330 Washington, DC 20037 www.aabc.com	202/737-0202
AASHTO	American Association of State Highway and Transportation Officials 555 12th St. NW - Suite 1000 Washington, DC 20004 www.transportation.org	202/624-5800
AATCC	American Association of Textile Chemists and Colorists P.O. Box 12215 Research Triangle Park, NC 27709-2215 www.aatcc.org	919/549-8141
ACA	American Coatings Association 901 New York Ave., NW, Suite 300 West Washington, DC 20001 www.paint.org	202/462-6272
ACI	American Concrete Institute 38800 Country Club Dr. Farmington Hills, MI 48331-3439 www.concrete.org	248/848-3800
ACPA	American Concrete Pipe Association 5605 N. MacArthur Blvd., Suite 340 Irving, TX 75038 www.concrete-pipe.org	972/506-7216

ADC	Air Duct Council 1901 N. Roselle Road, Suite 800 Schaumburg, IL 60195 www.flexibleduct.org	847/706-6750
AF&PA	American Forest and Paper Association 1101 K Street, NW, Suite 700 Washington, DC 20005 www.afandpa.org	202/463-2700
AGA	American Gas Association 400 North Capitol Street, NW, Suite 450 Washington, DC 20001 www.aga.org	202/824-7000
AGC	Associate General Contractors of America 2300 Wilson Blvd., Suite 300 Arlington, VA 22201 www.agc.org	703/548-3118
AHA	American Hardboard Association 1210 West Northwest Highway Palatine, IL 60067 http://domensino.com/AHA/default.htm	847/934-8800
AI	Asphalt Institute 2696 Research Park Drive Lexington, KY 40511-8480 www.asphaltinstitute.org	859/288-4960
AIA	The American Institute of Architects 1735 New York Ave., NW Washington, DC 20006-5292 www.aia.org	202/626-7300
AISC	American Institute of Steel Construction 130 East Randolph Street, Suite 2000 Chicago, IL 60601 www.aisc.org	312.670.2400
AISI	American Iron and Steel Institute 25 Massachusetts Ave., NW, Suite 800 Washington, DC 20001 www.steel.org	202/452-7100
AITC	American Institute of Timber Construction 1010 South 336th Street, #210 Federal Way, WA 98003-7394 https://www.plib.org/aitc/	253/835-3344

ALI	Associated Laboratories, Inc. P.O. Box 152837 Dallas, TX 75315 www.assoc-labs.com	214/565-0593
ALSC	American Lumber Standards Committee, Inc. 7470 New Technology Way, Suite F Frederick, MD 21703 www.alsc.org	301/972-1700
AMCA	Air Movement and Control Association International, Inc. 30 W. University Drive Arlington Heights, IL 60004 www.amca.org	847/394-0150
AMPP (formerly SSPC)	Association for Materials Protection and Performance (merger of Society for Protective Coatings and National Association of Corrosion Engineers International) (formerly Steel Structures Painting Council) 800 Trumbull Drive Pittsburgh, PA 15205 www.sspc.org	412/281-2331 877/281-7772
ANLA	AmericanHort (merger of American Nursery & Landscape Association and OFA – The Association of Horticultural Professionals) 2130 Stella Court Columbus, OH 43215 www.americanhort.org	614/487-1117
ANSI	American National Standards Institute 1899 L Street, NW, 11th Floor Washington, DC 20036 www.ansi.org	202/293-8020
APA	APA-The Engineered Wood Association 7011 S. 19th Street Tacoma, WA 98466-5333 www.apawood.org	253/565-6600

APA	Architectural Precast Association 325 John Knox Rd, Suite L-103 Tallahassee, FL 32303 www.archprecast.org	850/205-5637
APCIA	American Property Casualty Insurance Association (merger of American Insurance Association (formerly the National Board of Fire Underwriters) with the Property Casualty Insurers Association of America) 555 12th St, NW, Suite 550 Washington DC 20004 www.apci.org	202/828-7100
AHRI	Air Conditioning and Refrigeration Institute (now Air-Conditioning, Heating, & Refrigeration Institute) 2311 Wilson Blvd, Suite 400 Arlington, VA 22201 www.ahrinet.org	703/524-8800
ARMA	Asphalt Roofing Manufacturers Association 2331 Rock Spring Road Forest Hill, MD 21050 www.asphaltroofing.org	443/640-1075
ASA	The Acoustical Society of America Suite 300 1305 Walt Whitman Road Melville, NY 11747-4300 https://acousticalsociety.org/	516/576-2360
ASCE	American Society of Civil Engineers 1801 Alexander Bell Drive Reston, VA 20191 www.asce.org	800/548-2723 703/295-6300
ASHRAE	American Society of Heating, Refrigerating and Air Conditioning Engineers 180 Technology Parkway Peachtree Corners, GA 30092 www.ashrae.org	800/527-4723 404/636-8400
ASLA	American Society of Landscape Architects 636 Eye Street, NW Washington, DC 20001-3736 www.asla.org	202/898-2444
ASME	American Society of Mechanical Engineers Two Park Avenue New York, NY 10016-5990 www.asme.org	800/834-2763

ASPE	American Society of Plumbing Engineers 6400 Shafer Court, Suite 350 Rosemont, IL 60018 http://aspe.org	847/296-0002
ASQ	American Society for Quality P.O. Box 3005 Milwaukee, WI 53201-3005 or 600 North Plankinton Avenue Milwaukee, WI 53203 http://asq.org	800/248-1946 414/272-8575
ASSE	American Society of Sanitary Engineering 18927 Hickory Creek Dr., Suite 220 Mokena, IL 60448 www.asse-plumbing.org	708/995-3019
ASTM	ASTM International 100 Barr Harbor Drive PO Box C700 West Conshohocken, PA, 19428-2959 www.astm.org	610/832-9500
AWCI	Association of the Wall and Ceiling Industry 513 West Broad Street, Suite 210 Falls Church, VA 22046 www.awci.org	703/538-1600
AWPA	American Wood Protection Association (formerly American Wood Preservers Institute) P.O. Box 361784 Birmingham, AL 35236-1784 www.awpa.com	205/733-4077
AWS	American Welding Society 8669 NW 36 Street, Suite 130 Miami, FL 33166 www.aws.org	800/443-9353 305/443-9353
AWI	Architectural Woodwork Institute 46179 Westlake Drive, Suite 120 Potomac Falls, VA 20165-5874 www.awinet.org	571/323-3636
AWWA	American Water Works Association 6666 West Quincy Avenue Denver, CO 80235 www.awwa.org	800/926-7337 303/794-7711

BHMA	Builders Hardware Manufacturers Association 355 Lexington Avenue, 15th Floor New York, NY 10017 www.buildershardware.com	212/297-2122
BIA	The Brick Industry Association 12007 Sunrise Valley Drive, Suite 430 Reston, VA 20191 www.gobrick.com	703/620-0010
CGA	Compressed Gas Association 8484 Westpark Drive, Suite 220 McLean, VA 22102 www.cganet.com	703/788-2700
CISCA	Ceilings & Interior Systems Construction Association 1010 Jorie Blvd, Suite 30 Oak Brook, IL 60523 www.cisca.org	630/584-1919
CISPI	Cast Iron Soil Pipe Institute 2401 Fieldcrest Dr. Mundelein, IL 60060 www.cispi.org	224/864-2910
CLFMI	Chain Link Fence Manufacturers Institute 10015 Old Columbia Road, Suite B-215 Columbia, MD 21046 chainlinkinfo.org	301/596-2583
CPA	Composite Panel Association 19465 Deerfield Avenue, Suite 306 Leesburg, VA 20176 www.compositepanel.org	703/724-1128
CPSC	Consumer Product Safety Commission 4330 East-West Highway Bethesda, MD 20814 www.cpsc.gov	800/638-2772
CRA	California Redwood Association 818 Grayson Road, Suite 201 Pleasant Hill, CA 94523 www.calredwood.org	925/935-1499

CRI	Carpet and Rug Institute 100 S. Hamilton Street Dalton, GA 30722-2048 www.carpet-rug.org	706/278-3176
CRSI	Concrete Reinforcing Steel Institute 933 N. Plum Grove Road Schaumburg, IL 60173-4758 www.crsi.org	847/517-1200
CSI	The Construction Specifications Institute 123 North Pitt St, Suite 450 Alexandria, VA 22314 www.csinet.org	800/689-2900
CTIOA	Ceramic Tile Institute of America 12061 Jefferson Blvd. Culver City, CA 90230-6219 www.ctioa.org	310/574-7800
DHA	Decorative Hardwoods Association (formerly Hardwood Plywood & Veneer Association) 42777 Trade West Dr. Sterling, VA 20166 https://www.decorativehardwoods.org/	703/435-2900
DHI	Door and Hardware Institute (formerly National Builders Hardware Association) 2001 K Street NW, 3rd Floor North Washington, DC 20006 www.dhi.org	202/367-1134
DIPRA	Ductile Iron Pipe Research Association P.O. Box 190306 Birmingham, AL 35219 www.dipra.org	205/402-8700
DOC	U.S. Department of Commerce 1401 Constitution Ave., NW Washington, DC 20230 www.commerce.gov	202/482-2000
DOT	U.S. Department of Transportation 1200 New Jersey Avenue, SE Washington, DC 20590 www.dot.gov	855/368-4200
EJMA	Expansion Joint Manufacturers Association, Inc. 25 North Broadway Tarrytown, NY 10591 www.ejma.org	914/332-0040

EPA	Environmental Protection Agency Ariel Rios Building 1200 Pennsylvania Avenue, N.W. Washington, DC 20460 www.epa.gov	202/272-0167
FCICA	Floor Covering Installation Contractors Association 800 Roosevelt Rd., Bldg. C, Suite 312 Glen Ellyn, IL 60137 www.fcica.com	630/672-3702
FGIA	Fenestration and Glazing Industry Alliance 1900 E Golf Rd, Suite 1250 Schaumburg, IL 60173 https://fgiaonline.org/	847/303-5664
FM Global	Factory Mutual Insurance Company Amy Daley Global Practice Leader – Education, Public Entities, Health Care FM Global 270 Central Avenue Johnston, RI 02919-4949 www.fmglobal.com	401/275-3000 401/275-3029
FS	General Services Administration (GSA) Index of Federal Specifications, Standards and Commercial Item Descriptions 470 East L'Enfant Plaza, SW, Suite 8100 Washington, DC 20407 www.gsa.gov	202/619-8925
GA	The Gypsum Association 962 Wayne Ave., Suite 620 Silver Spring, MD 20910 www.gypsum.org	301/277-8686
HMA	Hardwood Manufacturers Association One Williamsburg Place, Suite 108 Warrendale, PA 15086 http://hmamembers.org	412/244-0440

IAPMO	International Association of Plumbing and Mechanical Officials (formerly the Western Plumbing Officials Association) 4755 E. Philadelphia St. Ontario, CA 91761 www.iapmo.org	909/472-4100
ICC	International Code Council 500 New Jersey Avenue, NW, 6th Floor Washington, DC 20001 www.iccsafe.org	888/422-7233
IEEE	Institute of Electrical and Electronics Engineers 3 Park Avenue, 17th Floor New York, NY 10016-5997 www.ieee.org	212/419-7900
IES	Illuminating Engineering Society 120 Wall Street, Floor 17 New York, NY 10005-4001 www.ies.org	212/248-5000
ITRK	Intertek Testing Services 3933 US Route 11 Cortland, NY 13045 www.intertek.com	607/753-6711
MCAA	Mechanical Contractors Association of America 1385 Piccard Drive Rockville, MD 20850 www.mcaa.org	301/869-5800
MMPA (formerly WMMPA)	Moulding & Millwork Producers Association (formerly Wood Moulding & Millwork Producers Association) 507 First Street Woodland, CA 95695 www.wmmpa.com	530/661-9591 800/550-7889
MSS	Manufacturers Standardization Society (MSS) of the Valve and Fittings Industry, Inc. 127 Park Street, NE Vienna, VA 22180-4602 http://mss-hq.org	703/281-6613
NAAMM	National Association of Architectural Metal Manufacturers 800 Roosevelt Rd. Bldg. C, Suite 312 Glen Ellyn, IL 60137 www.naamm.org	630/942-6591

NAIMA	North American Insulation Manufacturers Association P.O. Box 1906 Alexandria, VA 22313 https://insulationinstitute.org/	703/684-0084
NALP	National Association of Landscape Professionals (formerly Professional Landcare Network) 12500 Fair Lakes Circle, Suite 200 Fairfax, VA 22033 https://www.landscapeprofessionals.org/	703/736-9666
NAPA	National Asphalt Pavement Association 6406 Ivy Lane, Suite 350 Greenbelt, MD 20770-1441 www.asphaltpavement.org	888/468-6499 301/731-4748
NCSPA	National Corrugated Steel Pipe Association 14070 Proton Road, Suite 100 Dallas, TX 75244 www.ncspa.org	972/850-1907
NCMA	National Concrete Masonry Association 13750 Sunrise Valley Drive Herndon, VA 20171-4662 www.ncma.org	703/713-1900
NEBB	National Environmental Balancing Bureau 8575 Grovemont Circle Gaithersburg, MD 20877 www.nebb.org	301/977-3698
NECA	National Electrical Contractors Association 1201 Pennsylvania Ave. NW Washington, D.C., 20004 www.necanet.org	202/991-6300
NEMA	National Electrical Manufacturers Association 1300 North 17th Street N, Suite 900 Rosslyn, VA 22209 www.nema.org	703/841-3200
NEII	National Elevator Industry, Inc. 5537 SW Urish Road Topeka, KS 66610 https://nationalelevatorindustry.org/	703/589-9985
NFPA	National Fire Protection Association 1 Batterymarch Park Quincy, MA 02169-7471 www.nfpa.org	800/344-3555 855/274-8525

NGA (formerly GANA)	National Glass Association (merged with Glass Association of North America) 1945 Old Gallows Road Suite 750 Vienna, VA 22182 www.glass.org	866/342-5642 Ext 127
NHLA	National Hardwood Lumber Association PO Box 34518 Memphis, TN 38184 www.nhla.com	901/377-1818
NIA	National Insulation Association 516 Herndon Pkwy., Ste. D Herndon, VA 20170 www.insulation.org	703/464-6422
NRCA	National Roofing Contractors Association 10255 W. Higgins Road, Suite 600 Rosemont, IL 60018-5607 www.nrca.net	847/299-9070
NSF	NSF International 789 N. Dixboro Road Ann Arbor, MI 48113-0140 www.nsf.org	800/673-6275 734/769-8010
NSI	Natural Stone Institute (formerly Marble Institute of America) 380 E. Lorain St. Oberlin, OH 44074 https://www.naturalstoneinstitute.org/	440/250-9222
NTMA	National Terrazzo and Mosaic Association 209 N. Crockett Street, Suite 2 PO Box 2605 Fredericksburg, TX 78624 www.ntma.com	800/323-9736
OSHA	Occupational Safety and Health Act U.S. Department of Labor Occupational Safety & Health Administration 200 Constitution Ave., NW Washington, DC 20210 www.osha.gov	800/321-OSHA (6742)

PCA	Portland Cement Association 5420 Old Orchard Road Skokie, IL 60077 or 200 Massachusetts Ave NW, Suite 200 Washington, DC 20001 www.cement.org	847/966-6200 202/408-9494
PCA	Painting Contractors Association (formerly Painting and Decorating Contractors of America) 2316 Millpark Drive Maryland Heights, MO 63043 https://www.pcapainted.org/	800/322-7322
PCI	Precast/Prestressed Concrete Institute 8770 W. Bryn Mawr Ave., Suite 1150 Chicago, IL 60631 www.pci.org	312/786-0300
PDI	Plumbing & Drainage Institute 800 Turnpike Street, Suite 300 North Andover, MA 01845 http://pdionline.org	978/557-0720 800/589-8956
PEI	Porcelain Enamel Institute, Inc. P.O. Box 920220 Norcross, GA 30010 www.porcelainenamel.com	770/676-9366
PG&E	Pacific Gas & Electric Company P.O. Box 997300 Sacramento, CA 95899-7300 www.pge.com	800/743-5000
PLIB	Pacific Lumber Inspection Bureau (formerly West Coast Lumber Inspection Bureau) 1010 South 336th Street, Suite 210 Federal Way, WA 98003-7394 https://www.plib.org/	253/835-3344
RFCI	Resilient Floor Covering Institute 115 Broad Street, Suite 201 La Grange, GA 30240 www.rfci.com	706/882-3833
SDI	Steel Deck Institute P.O. Box 426 Glenshaw, PA 15116 www.sdi.org	412/487-3325

SDI	Steel Door Institute 30200 Detroit Road Westlake, OH 44145 www.steeldoor.org	440/899-0010
SJI	Steel Joist Institute 140 West Evans Street, Suite 203 Florence, SC 29501 http://steeljoist.org	843/407-4091
SMA	Stucco Manufacturers Association 5753 E Santa Ana Cyn Rd, #G-156 Anaheim, CA 92807 www.stuccomfgassoc.com	714/473-9579
SMACNA	Sheet Metal and Air Conditioning Contractors' National Association 4201 Lafayette Center Drive Chantilly, VA 20151-1219 www.smacna.org	703/803-2980
SPI	SPI: The Plastics Industry Trade Association, Inc. 1425 K St. NW, Suite 500 Washington, DC 20005 www.plasticsindustry.org	202/974-5200
TCA	The Tile Council of North America 100 Clemson Research Blvd. Anderson, SC 29625 www.tcnatile.com	864/646-8453
TPI	Truss Plate Institute 2670 Crain Highway, Suite 203 Waldorf, MD 20601 www.tpinst.org	240/587-5582
TPI	Turfgrass Producers International 444 E. Roosevelt Road #346 Lombard, IL 60148 www.turfgrasssod.org	800/405-8873 847/649-5555
TCIA	Tree Care Industry Association (formerly the National Arborist Association) 670 N Commercial Street, Suite 201 Manchester, NH 03101 www.tcia.org	603/314-5380 800/733-2622

TVI	The Vermiculite Institute c/o The Schundler Company 10 Central Street Nahant, MA 01908 www.vermiculiteinstitute.org	732/287-2244
UL	Underwriters Laboratories Inc. 333 Pfingsten Road Northbrook, IL 60062-2096 www.ul.com	847/272-8800 877/854-3577
UNI	Uni-Bell PVC Pipe Association 201 E. John Carpenter Freeway, Suite 750 Irving, TX 75062 www.uni-bell.org	972/243-3902
USDA	U.S. Department of Agriculture 1400 Independence Ave., S.W. Washington, DC 20250 www.usda.gov	202/720-2791
WA	Wallcoverings Association 35 E Wacker Dr., Suite 850 Chicago, IL 60601 www.wallcoverings.org	312/224-2574
WCMA	Window Covering Manufacturers Association 355 Lexington Avenue 15th Floor New York, NY 10017 www.wcmanet.org	212/297-2122
WDMA	Window & Door Manufacturers Association 2001 K Street NW, 3rd Floor North Washington, D.C. 20006 www.wdma.com	202/367-1157
WI	Woodwork Institute 1455 Response Road, Suite 110 Sacramento, CA 95815 www.wicnet.org	916/372-9943
WRI	Wire Reinforcement Institute 942 Main Street, Suite 300 Hartford, CT 06103 www.wirereinforcementinstitute.org	860/240-9545
WWCA	Western Wall & Ceiling Contractors Association 1910 N. Lime St. Orange, CA 92865 www.wwcca.org	714/221-5520

WWPA	Western Wood Products Association (formerly Redwood Inspection Service) 1500 SW First Ave., Suite 870 Portland, OR 97201 www.wwpa.org	503/224-3930
------	--	--------------

PART 2 - PRODUCTS Not Used.

PART 3 - EXECUTION Not Used.

END OF DOCUMENT

MATERIALS AND EQUIPMENT

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Purchase of Materials and Equipment;
- B. Special Conditions;
- C. Imported Materials Certification.

1.02 MATERIAL AND EQUIPMENT

- A. Only items approved by the District and/or Design Professional shall be used.
- B. Contractor shall submit lists of products and other product information in accordance with the Contract Documents, including, without limitation, the provisions regarding the submittals.

1.03 MATERIAL AND EQUIPMENT COLORS

- A. The District and/or Architect will provide a schedule of colors.
- B. No individual color selections will be made until after approval of all pertinent materials and equipment and after receipt of appropriate samples in accordance with the Contract Documents, including, without limitation, the provisions regarding the submittals.
- C. Contractor shall request priority in writing for any item requiring advance ordering to maintain the approved Construction Schedule.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. Contractor shall deliver manufactured materials in original packages, containers, or bundles (with seals unbroken), bearing name or identification mark of manufacturer.
- B. Contractor shall deliver fabrications in as large assemblies as practicable; where specified as shop-primed or shop-finished, package or crate as required to preserve such priming or finish intact and free from abrasion.
- C. Contractor shall store materials in such a manner as necessary to properly protect them from damage. Materials or equipment damaged by handling, weather, dirt, or from any other cause will not be accepted.

- D. Materials are not acceptable that have been warehoused for long periods of time, stored or transported in improper environment, improperly packaged, inadequately labeled, poorly protected, excessively shipped, deviated from normal distribution pattern, or reassembled.
- E. Contractor shall store material so as to cause no obstructions of sidewalks, roadways, access to the Site or buildings, and underground services. Contractor shall protect material and equipment furnished under Contract.
- F. Contractor may store materials on Site with prior written approval by the District, all material shall remain under Contractor's control and Contractor shall remain liable for any damage to the materials. Should the Project Site not have storage area available, the Contractor shall provide for off-site storage at a bonded warehouse and with appropriate insurance coverage at no cost to District.
- G. When any room in Project is used as a shop or storeroom, the Contractor shall be responsible for any repairs, patching, or cleaning necessary due to that use. Location of storage space shall be subject to prior written approval by District.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Manufacturers listed in various sections of Contract Documents are names of those manufacturers that are believed to be capable of supplying one or more of items specified therein.
- B. The listing of a manufacturer does not imply that every product of that manufacturer is acceptable as meeting the requirements of the Contract Documents.

2.02 FACILITIES AND EQUIPMENT

Contractor shall provide, install, maintain, and operate a complete and adequate facility for handling, the execution, disposal, and distribution of material and equipment as required for proper and timely performance of Work connected with Contract.

2.03 MATERIAL REFERENCE STANDARDS

Where material is specified solely by reference to "standard specifications" and if requested by District, Contractor shall submit for review data on actual material proposed to be incorporated into Work of Contract listing name and address of vendor, manufacturer, or producer, and trade or brand names of those materials, and data substantiating compliance with standard specifications.

PART 3 - EXECUTION

3.01 WORKMANSHIP

- A. Where not more specifically described in any other Contract Documents, workmanship shall conform to methods and operations of best standards and accepted practices of trade or trades involved and shall include items of fabrication, construction, or installation regularly furnished or required for completion (including finish and for successful operation, as intended).
- B. Work shall be executed by tradespersons skilled in their respective lines of Work. When completed, parts shall have been durably and substantially built and present a neat appearance.

3.02 COORDINATION

- A. Contractor shall coordinate installation of Work so as to not interfere with installation of others. Adjustment or rework because of Contractor's failure to coordinate will be at no additional cost to District.
- B. Contractor shall examine in-place work for readiness, completeness, fitness to be concealed or to receive other work, and in compliance with Contract Documents. Concealing or covering Work constitutes acceptance of additional cost which will result should in-place Work be found unsuitable for receiving other Work or otherwise deviating from the requirements of the Contract Documents.

3.03 COMPLETENESS

Contractor shall provide all portions of the Work, unless clearly stated otherwise, installed complete and operational with all elements, accessories, anchorages, utility connections, etc., in manner to assure well-balanced performance, in accordance with manufacturer's recommendations and by Contract Documents. Terms such as "installed complete," "operable condition," "for use intended," "connected to all utilities," "terminate with proper cap," "adequately anchored," "patch and refinish," "to match similar," should be assumed to apply in all cases, except where completeness of functional or operable condition is specifically stated as not required.

3.04 APPROVED INSTALLER OR APPLICATOR

Installation by a manufacturer's approved installer or applicator is an understood part of Specifications and only approved installer or applicator is to provide on-site Work where specified manufacturer has on-going program of approving (i.e. certifying, bonding, re-warranting) installers or applicators. Newly established relationships between a manufacturer and an installer or applicator who does not have other approved applicator work in progress or completed is not approved for this Project.

3.05 MANUFACTURER'S RECOMMENDATIONS

All installations shall be in accordance with manufacturer's published recommendations and specific written directions of manufacturer's representative.

Should Contract Documents differ from recommendations of manufacturer or directions of his representative, Contractor shall analyze differences, make recommendations to the District and the Architect in writing, and shall not proceed until interpretation or clarification has been issued by the District and/or the Architect.

END OF DOCUMENT

QUALITY CONTROL

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Inspector, Inspections and Tests, Uncovering of Work and Non-conforming of Work and Correction of Work;
- B. Special Conditions.

1.02 RELATED CODES:

- A. The Work is governed by requirements of Title 24, California Code of Regulations ("CCR"), and the Contractor shall keep a copy of these available at the job Site for ready reference during construction.
- B. The Division of the State Architect ("DSA") shall be notified at or before the start of construction.

1.03 OBSERVATION AND SUPERVISION:

- A. The District and Architect or their appointed representatives will review the Work and the Contractor shall provide facilities and access to the Work at all times as required to facilitate this review. Administration by the Architect and any consulting Structural Engineer will be in accordance with applicable regulations, including, without limitation, CCR, Part 1, Title 24, Section 4-341.
- B. One or more Project Inspector(s) approved by DSA and employed by or in contract with the District, referred to hereinafter as the "Project Inspector", will observe the work in accordance with CCR, Part 1, Title 24, Sections 4-333(b) and 4-342:
 - (1) The Project Inspector and Special Inspector(s) shall have access to the Work wherever it is in preparation or progress for ascertaining that the Work is in accordance with the Contract Documents and all applicable code sections. The Contractor shall provide facilities and operation of equipment as needed, and access as required and shall provide assistance for sampling or measuring materials.
 - (2) The Project Inspector will notify the District and Architect and call the attention of the Contractor to any observed failure of Work or material to conform to Contract Documents.

The Contractor shall conform with all applicable laws as indicated in the Contract Documents, including, without limitation, to CCR, Part 1, Title 24, Section 4-343.

The Contractor shall supervise and direct the Work and maintain a competent superintendent on the job who is authorized to act in all matters pertaining to the Work. The Contractor's superintendent shall also inspect all materials, as they arrive, for compliance with the Contract Documents. Contractor shall reject defective Work or materials immediately upon delivery or failure of the Work or material to comply with the Contract Documents. The Contractor shall submit verified reports as indicated in the Contract Documents, including, without limitation, the Specifications and as required by Part 1, Title 24, Section 4-336.

1.04 TESTING AGENCIES:

- A. Testing agencies and tests shall be in conformance with the General Documents and the requirements of Part 1, Title 24, Section 4- 335.
- B. Testing and inspection in connection with earthwork shall be under the direction of the District's consulting soils engineer, if any, referred to hereinafter as the "Soils Engineer."
- C. Testing and inspection of construction materials and workmanship shall be performed by a qualified laboratory, referred to hereinafter as the "Testing Laboratory." The Testing Laboratory shall be under direction of an engineer registered in the State of California, shall conform to requirements of ASTM E329, and shall be employed by or in contract with the District.
- D. Testing laboratory shall be approved by the Architect and the Division of the State Architect.
- E. Owner will employ and pay for services of an independent testing labatory to perform specified inspection and testing. Retesting cost for failed test will be Contractors responsibilityand will be back-charged against the contract.

1.05 TESTS AND INSPECTIONS:

- A. The Contractor shall be responsible for notifying the District and Project Inspector of all required tests and inspections. Contractor shall notify the District and Project Inspector at least seventy-two hours (72) hours in advance of performing any Work requiring testing or inspection.
- B. The Contractor shall provide access to Work to be tested and furnish incidental labor, equipment, and facilities to facilitate all inspections and tests.
- C. The District will pay for first inspections and tests required by the "CCR", and other inspections or tests that the District and/or the Architect may direct to have made, including the following principal items:
 - (1) Tests and observations for earthwork and paving.
 - (2) Tests for concrete mix designs, including tests of trial batches.
 - (3) Tests and inspections for structural steel work.
 - (4) Field tests for framing lumber moisture content.

- (5) Additional tests directed by the District that establish that materials and installation comply with the Contract Documents.
 - (6) Tests and observations of welding and expansion anchors.
- D. The District may at its discretion, pay and then back charge the Contractor for:
 - (1) Retests or reinspections, if required, and tests or inspections required due to Contractor error or lack of required identifications of material.
 - (2) Uncovering of work in accordance with Contract Documents.
 - (3) Testing done on weekends, holidays, and overtime will be chargeable to the Contractor for the overtime portion.
 - (4) Testing done off Site.
- E. Testing and inspection reports and certifications:
 - (1) If initially received by Contractor, Contractor shall provide to each of the following a copy of the agency or laboratory report of each test or inspection or certification.
 - (a) The District;
 - (b) The Construction Manager, if any;
 - (c) The Architect;
 - (d) The Consulting Engineer, if any;
 - (e) Other engineers on the Project, as appropriate;
 - (f) The Project Inspector; and
 - (g) The Contractor.
 - (2) When the test or inspection is one required by the CCR, a copy of the report shall also be provided to the DSA.

1.06 LABORATORY REPORTS

- A. After each inspection and test, promptly submit two copies of laboratory report to Owner, Architect, Contractor and DSA.
- B. Include:
 - (1) Date of issue,
 - (2) DSA Application and File numbers,
 - (3) Project title and number,

- (4) Name of inspector,
 - (5) Date and time of sampling or inspection,
 - (6) Identification of product and Specification Section,
 - (7) Location in the Project,
 - (8) Type of inspection or test,
 - (9) Date of test,
 - (10) Results of test,
 - (11) Conformance with Contract Documents.
- C. When requested by Architect, provide interpretation of test results.

1.07 LIMITS ON TESTING LABORATORY AUTHORITY

- A. Laboratory may not release, revoke, alter or enlarge on requirements of Contract Documents.
- B. Laboratory may not approve or accept any portion of the work.
- C. Laboratory may not assume any duties of Contractor.
- D. Laboratory has no authority to stop the work.

PART 2 - PRODUCTS

2.01 TYPE OF TEST AND INSPECTIONS

- A. Testing and inspection shall be in accordance with DSA Form 103 (or current version)
- B. Slump Test
ASTM C 143
- C. Concrete Tests

Testing agency shall test concrete used in the work per the following paragraphs:

- (1) Compressive Strength:
 - (a) Minimum number of tests required: One (1) set of three (3) cylinders for each 100 cubic yards (Sec. 2604(h) 01) of concrete or major fraction thereof, placed in one (1) day. See Title 24, Section 2605(g).

- (b) Two cylinders of each set shall be tested at twenty-eight (28) days. One (1) cylinder shall be held in reserve and tested only when directed by the Architect or District.
- (c) Concrete shall test the minimum ultimate compressive strength in twenty-eight 28 days, as specified on the structural drawings.
- (d) In the event that the twenty-eight (28) day test falls below the minimum specified strength, the effective concrete in place shall be tested by taking cores in accordance with UBC Standard No. 26-13 and tested as required for cylinders.
- (e) In the event that the test on core specimens falls below the minimum specified strength, the concrete will be deemed defective and shall be removed and replaced upon such direction of the Architect, and in a manner acceptable to the Division of the State Architect.

D. Reinforcing, Steel

PART 3 - EXECUTION Not Used.

END OF DOCUMENT

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Administrative and procedural requirements related to inspections, tests, and related quality control procedures required to be performed by the Contractor and that facilitate the Contractor's compliance with the Contract Documents.

1.2 RELATED REQUIREMENTS

- A. Section 01 3300, Submittal Procedures; submission of manufacturers' instructions and certificates.
- B. Section 01 4523, Testing and Inspecting Services, and DSA 103; Special Tests and Inspections required by authorities having jurisdiction and are the responsibility of Owner.
- C. Section 01 7700, Closeout Procedures.
- D. Specific requirements for testing, inspections, mockups, and other quality control requirements as described in the various Sections of the Specifications.

1.3 DEFINITIONS

- A. Experienced: When used with an entity or individual, and unless otherwise specified, means having successfully completed a minimum of three previous projects similar in nature, size, and extent to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.
- B. Field Quality-Control Tests: Tests and inspections that are performed on-site for installation of the Work and for completed Work.
- C. Installer/Applicator/Erector: Contractor or another entity engaged by Contractor as an employee, subcontractor, or sub-subcontractor, to perform a particular construction operation, including installation, erection, application, assembly, and similar operations.
- D. Mockups: Full-size, physical assemblies that are constructed on-site and in-place mockups to demonstrate aesthetic effects and, where indicated, qualities of materials and execution, and to review construction, coordination, interface, testing, and operation of various building components. Mockups are not samples.
- E. Tests: Procedures intended to establish the quality, performance, or reliability of a product or system conducted by a qualified Testing Agency.
- F. Source Quality-Control Tests: Tests and inspections related to materials manufactured or fabricated away from the jobsite that will be incorporated into the work.

FIELD QUALITY CONTROL PROCEDURES
SECTION 01 4516
3595001

- G. Testing Agency: An independent entity engaged to perform specific tests, inspections, or both, is qualified to operate in California, and meets the additional requirements specified.
 - 1. Testing laboratory shall mean the same as Testing Agency.
- H. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.
- I. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that actual products incorporated into the Work and completed construction comply with requirements. Contractor's quality-control services do not include Contract administration activities performed by Architect.

1.4 REFERENCES AND STANDARD SPECIFICATIONS

- A. General:
 - 1. The Contract Documents contain references to various standard specifications, codes, practices, and requirements for materials, work quality, installation, inspections, and tests published and issued by the organizations, societies, and associations.
 - 2. Contractor shall obtain its own copies of required specified referenced publications.
 - 3. The specification or standard referred to shall have full force and effect as though printed in these Specifications.
 - 4. When the effective date of a reference standard is not specified, it shall be understood that the current edition or latest revision thereof and any amendments or supplements thereto in effect on the date of the DSA approval, shall govern the Work.
 - 5. The contractual relationships, duties, and responsibilities of the parties in Contract or those of the Architect shall not be altered from the Contract Documents by mention or inference otherwise in any reference document.
- B. Products or workmanship specified by association, trade, or other consensus standards shall comply with requirements of the referenced standard or specification except when more rigid requirements are specified or are required by applicable codes.
- C. Conflicting Requirements:
 - 1. If compliance with two or more standards or requirements are specified and the standards or requirements establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement.
 - 2. Refer conflicting requirements that are different, but apparently equal, to Architect for direction before proceeding.

1.5 ADMINISTRATIVE REQUIREMENTS

- A. Submittal Procedures:
 - 1. Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
 - 2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.

1.6 INFORMATIONAL SUBMITTALS

- A. Schedule of Tests and Inspections.
- B. Field Superintendent's Quality Control Responsibilities
- C. Procedures for inspection prior to subsequent Work or cover up.
- D. Qualifications of Contractor's Testing Agencies.
- E. Certified copies of Reports and Documents.

1.7 CLOSEOUT SUBMITTALS

- A. Permits, Licenses, and Certificates: Copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents established for compliance with standards and regulations bearing on performance of the Work.
- B. Test and Inspection Log including final record for each test and inspection as specified in Part 3 and in accordance with Section 01 7839, Project Record Documents.

1.8 REPORTS AND DOCUMENTS

- A. Test and Inspection Reports: Prepare and submit certified written reports where specified in the Specification Sections. Include the following:
 - 1. Date of issue.
 - 2. Project title and number.
 - 3. Name, address, and telephone number of testing agency.
 - 4. Dates and locations of samples and tests or inspections.
 - 5. Names of individuals making tests and inspections.
 - 6. Description of the Work and test and inspection method.
 - 7. Identification of product and Specification Section.
 - 8. Complete test or inspection data.
 - 9. Test and inspection results and an interpretation of test results.
 - 10. Record of temperature and weather conditions at time of sample taking and testing and inspecting.

FIELD QUALITY CONTROL PROCEDURES
SECTION 01 4516
3595001

11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
12. Name and signature of laboratory inspector.
13. Recommendations on retesting and re-inspecting.

1.9 QUALITY ASSURANCE

- A. Minimum Quantity or Quality Levels:
1. The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements.
 2. Refer uncertainties to Architect for a decision before proceeding.
- B. Use of trade-specific terminology in referring to a trade or entity does not require that certain construction activities be performed by accredited or unionized individuals, or that requirements specified apply exclusively to specific trade(s).
- C. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce Work of specified quality.
- D. Correct conditions or workmanship not in conformance with specified standards or quality. Do so immediately after non-conformance item is discovered or within a reasonable time frame agreed upon with Construction Manager.
- E. Comply with manufacturers' instructions, including each step in sequence. Should manufacturers' instructions conflict with Contract Documents, request clarification from the Architect before proceeding.
- F. Comply with specified standards as minimum quality for the Work, except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.
- G. Perform Work by persons qualified to produce required and specified quality.
- H. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, or disfigurement.
- I. Upon delivery to the jobsite, materials and products shall be inspected for compliance with the Project Specifications.
1. Nonconforming materials, products, equipment, hardware, tools and/or safety devices shall be removed immediately from the general work area and stored within a secured area approved by the Owner as "NON CONFORMING MATERIALS AREA" to ensure that defective or nonconforming materials are not incorporated into or used on the project
 2. Materials or products shall not be removed from the designated area until they are deemed by the Architect to be in compliance, or until they are modified or fixed to

meet the project specifications, or until they are removed from the jobsite for the purposes of disposal or shipment back to the manufacturer.

1.10 CONTRACTORS TESTING AGENCY

- A. Qualifications: At Contractor's expense, provide an independent testing laboratory nationally recognized according to 29 CFR 1910.7 and accredited according to NIST's National Voluntary Laboratory Accreditation Program (NVLAP,) or other independent agency with the experience and capability to conduct testing and inspecting indicated, documented according to ASTM E329; with additional qualifications specified in individual Sections; and, where required, that is acceptable to authorities having jurisdiction.
- B. Testing Agency shall cooperate with Architect, Construction Manager, Owner's Project Inspector, and Contractor in performance of duties.
- C. Testing Agency shall provide qualified personnel to perform required tests and inspections.
- D. Testing Agency shall not be authorized to release, revoke, alter, or increase the Contract Document requirements, approve or accept any portion of the Work, or perform any duties of Contractor.

1.11 TESTS AND INSPECTIONS

- A. Preconstruction Testing: Where preconstruction testing is specified to verify performance requirements, comply with the following as applicable:
 - 1. Contractor Responsibilities:
 - a. Provide test specimens representative of proposed products and construction.
 - b. Submit specimens in a timely manner with sufficient time for testing and analyzing results to prevent delaying the Work.
 - c. Provide sizes and configurations of test assemblies, mockups, and laboratory mockups to adequately demonstrate capability of products to comply with performance requirements.
 - d. Build site-assembled test assemblies and mockups using installers who will perform same tasks for Project.
 - e. Build laboratory mockups at testing facility using personnel, products, and methods of construction indicated for the completed Work.
 - f. When testing is complete, remove test specimens, assemblies, and mockups; do not reuse products on Project unless approved by Architect in writing.
- B. Tests and Inspections indicated in individual Specification Sections shall be conducted by a qualified Testing Agency. The responsibilities of the Testing Agency shall be as follows:

FIELD QUALITY CONTROL PROCEDURES
SECTION 01 4516
3595001

1. Verifying that manufacturer maintains detailed fabrication and quality-control procedures and reviews the completeness and adequacy of those procedures to perform the Work.
 2. Notifying Architect, Construction Manager, Owner's Project Inspector, and Contractor promptly of irregularities and deficiencies observed in the Work during performance of its services.
 3. Submit a certified written report of each test, inspection, and similar quality-control service to Architect, Construction Manager, and Owner's Project Inspector with copy to Contractor and to DSA.
 4. Submit a final report of tests and inspections at Substantial Completion which includes a list of unresolved deficiencies.
 5. Interpret tests and inspections and stating in each report whether tested and inspected work complies with or deviates from the Contract Documents.
 6. Retest and reinspect corrected work.
- C. Monitoring and Documentation: Contractor shall maintain testing and inspection reports including log of approved and rejected results as specified in Part 3.
1. Include work Architect has indicated as nonconforming or defective.
 2. Indicate corrective actions taken to bring nonconforming work into compliance with requirements.
 3. Comply with requirements of the California Division of the State Architect (DSA).

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 NOTIFICATIONS

- A. Contractor shall provide the following notifications;
1. Owner's Project Inspector writing:
 - a. 24 hours in advance of starting new Work
 - b. 24 hours in advance of each test or inspection
 2. 48 hours' prior notice, minimum, to the Testing Agency for required tests and inspections.

3.2 TEST AND INSPECTION FIELD BINDER

- A. Contractor shall maintain in the Field Office a Test and Inspection Field Binder that includes a hard copy of the following documents:
1. Approved Quality Control Plan.
 2. Specification Sections that apply to the respective portions of work.
 3. RFI's, CCD's or other approved document that changes the work.

4. Manufacturer's Installation Instructions (MII).
5. Specific details of the Work as requested by the Inspector.
6. Test and Inspection Log.

3.3 TEST AND INSPECTION LOG

- A. Prepare and maintain a record of tests and inspections using an electronic spreadsheet.
- B. Include the following information:
 1. Date test or inspection was conducted.
 2. Description of the Work tested or inspected.
 3. List pertinent detail/sheet number.
 4. List pertinent Specification Section.
 5. Attach manufacturer's installation inspections if applicable.
 6. List and attach RFI's, ASI's or CCD's affecting the Work.
 7. Date Inspector verified work is acceptable.
- C. Final record for each test and inspection shall be submitted on Contractors letterhead and include the name of the responsible person to verify Work was in accordance with the approved Contract Documents.

3.4 MANUFACTURERS' FIELD SERVICES

- A. When specified in respective Specification Sections, Contractor shall require supplier or manufacturer to provide qualified personnel to observe field conditions, conditions of surfaces and installation, quality of workmanship, start-up of equipment, testing, adjusting and balancing of equipment as applicable, and to make appropriate recommendations. Contractor is responsible for proper notification of manufacturer's representative before installation of applicable work and for obtaining necessary inspection certificate stating that installation was observed and approved.
- B. Product Performance Verification: The supplier of products specified based on performance criteria shall, at the request of the Agency, inspect the installed product and certify conformance of the product to specified criteria under the installed conditions.
- C. Manufacturer's representative shall submit written report to the Architect listing observations and recommendations.

3.5 TOLERANCES - GENERAL

- A. Monitor tolerance control of installed products or portions to produce acceptable Work. Do not permit tolerances to accumulate.
- B. Comply with manufacturers' tolerances. Should manufacturers' tolerances conflict with Contract Documents, request clarification from Architect before proceeding.
- C. Adjust products to appropriate dimensions; position before securing products in place.

FIELD QUALITY CONTROL PROCEDURES
SECTION 01 4516
3595001

3.6 DIMENSIONING AND TOLERANCES FOR ACCESSIBILITY

- A. While it is recognized that construction practices generally permit a level of reasonable dimensional tolerance, the installation of items subject to compliance with the Americans with Disabilities Act Accessibility Guidelines and Chapter 11B of the California Building Code, typically does not allow such tolerances. Therefore, these dimensions are to be considered absolute and will be strictly enforced. Items found to be out of tolerance may require modification and/or replacement at Contractor's expense.

3.7 REPAIR AND PROTECTION

- A. On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.
 - 1. Provide materials and comply with installation requirements specified in other Specification Sections or matching existing substrates and finishes.
 - 2. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible. Comply with the Contract Document requirements for cutting and patching in Section 01 7329, Cutting and Patching.
- B. Protect construction exposed by or for quality-control service activities.
- C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

END OF SECTION

p:\sacramento\3595 tracy unified school district\001-000_villalovoz es new shade structures\08 specifications\06 spec\04 final\freiler - shade struct\01 4516_field quality control procedures.docx
Last Updated: August 28, 2020

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Requirements for Testing Laboratory.
 - 2. Contractor's responsibilities for facilitation of Testing and Inspections.

1.2 RELATED SECTIONS AND DOCUMENTS

- A. Geologic Hazards & Soils Report.
- B. DSA 103 - Structural Test & Inspections List.
- C. Section 13 3423, Relocatable Buildings.
- D. Division 23, Mechanical Work - Testing, adjusting, and balancing of systems.
- E. Section 31 0000, Earthwork.
- F. Individual Specification Sections: Inspections and tests required, and standards for testing.

1.3 REFERENCES

- A. California Administrative Code (CAC), edition as noted on the drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Building Code (CBC), edition as noted on the drawings, as adopted by the California Division of the State Architect (DSA).

1.4 SELECTION AND PAYMENT

- A. Testing laboratory shall be approved by both the Architect and the Division of the State Architect.
- B. Owner will employ and pay for services of an independent testing laboratory to perform specified inspection and testing. Retesting costs for failed tests will be the Contractors responsibility and will be back-charged against the contract.
- C. Under provisions for Relocatable Building construction, Owner limits his exposure to in-plant inspection and testing costs. Refer to other Specification Sections related to such specific construction.
- D. Employment of testing laboratory shall in no way relieve Contractor of obligation to perform work in accordance with requirements of Contract Documents.

TESTING AND INSPECTION SERVICES

SECTION 01 4523

3595001

1.5 LABORATORY REPORTS

- A. After each inspection and test, promptly submit two copies of laboratory report to Owner, Architect, Contractor and DSA.
- B. Include:
 - 1. Date of issue,
 - 2. DSA Application and File numbers,
 - 3. Project title and number,
 - 4. Name of inspector,
 - 5. Date and time of sampling or inspection,
 - 6. Identification of product and Specification Section,
 - 7. Location in the Project,
 - 8. Type of inspection or test,
 - 9. Date of test,
 - 10. Results of test,
 - 11. Conformance with Contract Documents.
- C. When requested by Architect, provide interpretation of test results.

1.6 LIMITS ON TESTING LABORATORY AUTHORITY

- A. Laboratory may not release, revoke, alter or enlarge on requirements of Contract Documents.
- B. Laboratory may not approve or accept any portion of the work.
- C. Laboratory may not assume any duties of Contractor.
- D. Laboratory has no authority to stop the work.

1.7 CONTRACTOR RESPONSIBILITIES

- A. Deliver to laboratory at designated location, adequate samples of materials proposed to be used which require testing, along with proposed mix designs. Allow reasonable time for review and testing.
- B. Arrange for, and coordinate with, laboratory for all required testing and inspection. Provide adequate notice, in advance, for proper scheduling and processing of testing. The Inspector will not be responsible for scheduling or arranging for testing and inspection services.
- C. Cooperate with laboratory personnel, and provide access to the work and to manufacturer's facilities.
- D. Provide incidental labor and facilities to provide access to work to be tested, to obtain and handle samples at the site or at the source of products to be tested, to facilitate tests and inspections, storage and curing of test samples.

TESTING AND INSPECTION SERVICES

SECTION 01 4523

3595001

- E. Notify Architect, Inspector, Structural Engineer (when applicable) and laboratory 24 hours prior to expected time for operations requiring inspection and testing services.

END OF SECTION

*p:\sacramento\3595 tracy unified school district\001-000_villalovoz es new shade structures\08 specifications\06 spec\04 final\freiler
- shade struct\01 4523_testing and inspection services.docx
Last Updated: December 16, 2021*

TEMPORARY FACILITIES AND CONTROLS

PART 1 – GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions;
- B. Special Conditions;
- C. Site Standards; and
- D. Construction Waste Management and Disposal.

1.02 TEMPORARY UTILITIES:

A. Electric Power and Lighting:

- (1) Contractor will pay for power during the course of the Work. To the extent power is available in the building(s) or on the Site, Contractor may use the District's existing utilities by making prearranged payments to the District for the utilities used by Contractor and all Subcontractors. Contractor shall be responsible for providing temporary facilities required to deliver that power service from its existing location in the building(s) or on the Site to point of intended use.
- (2) Contractor shall verify characteristics of power available in building(s) or on the Site. Contractor shall take all actions required to make modifications where power of higher voltage or different phases of current are required. Contractor shall be fully responsible for providing that service and shall pay all costs required therefor.
- (3) Contractor shall furnish, wire for, install, and maintain temporary electrical lights wherever it is necessary to provide illumination for the proper performance and/or observation of the Work: a minimum of 20 foot-candles for rough work and 50 foot-candles for finish work.
- (4) Contractor shall be responsible for maintaining existing lighting levels in the project vicinity should temporary outages or service interruptions occur.

B. Water:

- (1) Contractor shall pay for water used during the course of the Work. Contractor shall coordinate and pay for installation or use of water meter in compliance with local water agency requirements. To the

extent water is then available in the building(s) or on the Site, Contractor may use the District's existing utilities by making prearranged payments to the District for the utilities used by Contractor and all Subcontractors. Contractor shall be responsible for providing temporary facilities required to deliver such utility service from its existing location in the building(s), on the Site, or other location approved by the local water agency, to point of intended use.

- (2) Contractor shall use backflow preventers on water lines at point of connection to District's water supply. Backflow preventers shall comply with requirements of Uniform Plumbing Code.
- (3) Contractor shall make potable water available for human consumption.

C. Sanitary Facilities:

- (1) Contractor shall provide sanitary temporary facilities in no fewer numbers than required by law and such additional facilities as may be directed by the Inspector for the use of all workers. The facilities shall be maintained in a sanitary condition at all times and shall be left at the Site until removal is directed by the Inspector or Contractor completes all other work at the Site.
- (2) Use of toilet facilities in the Work under construction shall not be permitted except by consent of the Inspector and the District.

D. Fire Protection:

- (1) Contractor shall provide and maintain fire extinguishers and other equipment for fire protection. Such equipment shall be designated for use for fire protection only and shall comply with all requirements of the California Fire, State Fire Marshall and/or its designee.
- (2) Where on-site welding and burning of steel is unavoidable, Contractor shall provide protection for adjacent surfaces.

E. Trash Removal:

- (1) Contractor shall provide trash removal on a timely basis. Under no circumstance shall Contractor use District trash service.

F. Field Office:

- (1) If Contractor chooses to provide a field office, it shall be an acceptable construction trailer that is well-lit and ventilated. The construction trailer shall be equipped with shelves, desks, filing cabinet, chairs, and such other items of equipment needed. Trailer and equipment are the property of the Contractor and must be removed from the Site upon completion of the Work.
- (2) Contractor shall provide any additional electric lighting and power required for the trailer. Contractor shall make adequate provisions for heating and cooling as required.

1.03 CONSTRUCTION AIDS:

- A. Plant and Equipment:
 - (1) Contractor shall furnish, operate, and maintain a complete plant for fabricating, handling, conveying, installing, and erecting materials and equipment; and for conveyances for transporting workers. Include elevators, hoists, debris chutes, and other equipment, tools, and appliances necessary for performance of the Work.
 - (2) Contractor shall maintain plant and equipment in safe and efficient operating condition. Damages due to defective plant and equipment, and uses made thereof, shall be repaired by Contractor at no expense to the District.
- B. None of the District's tools and equipment shall be used by Contractor for the performance of the Work.

1.04 BARRIERS AND ENCLOSURES:

- A. Contractor shall obtain the District's written permission for locations and types of temporary barriers and enclosures, including fire-rated materials proposed for use, prior to their installation.
- B. Contractor shall provide and maintain temporary enclosures to prevent public entry and to protect persons using other buildings and portions of the Site and/or Premises, the public, and workers. Contractor shall also protect the Work and existing facilities from the elements, and adjacent construction and improvements, persons, and trees and plants from damage and injury from demolition and construction operations.
- C. Contractor shall provide site access to existing facilities for persons using other buildings and portions of the Site, the public, and for deliveries and other services and activities.
- D. Tree and Plant Protection:
 - (1) Contractor shall preserve and protect existing trees and plants on the Premises that are not designated or required to be removed, and those adjacent to the Premises.
 - (2) Contractor shall provide barriers to a minimum height of 4'-0" around drip line of each tree and plant, around each group of trees and plants, as applicable, in the proximity of demolition and construction operations, or as denoted on the Plans.
 - (3) Contractor shall not park trucks, store materials, perform Work or cross over landscaped areas. Contractor shall not dispose of paint thinners, water from cleaning, plastering or concrete operations, or other deleterious materials in landscaped areas, storm drain systems, or sewers. Plant materials damaged as a result of the performance of the Work shall, at the option of the District and at Contractor's expense, either be replaced with new plant materials equal in size to

those damaged or by payment of an amount representing the value of the damaged materials as determined by the District.

- (4) Contractor shall remove soil that has been contaminated during the performance of the Work by oil, solvents, and other materials which could be harmful to trees and plants, and replace with good soil, at Contractor's expense.
- (5) Excavation around Trees:
 - (a) Excavation within drip lines of trees shall be done only where absolutely necessary and with written permission from the District.
 - (b) Where trenching for utilities is required within drip lines, tunneling under and around roots shall be by hand digging and shall be approved by the District. Main lateral roots and taproots shall not be cut. All roots 2 inches in diameter and larger shall be tunneled under and heavily wrapped with wet burlap so as to prevent scarring or excessive drying. Smaller roots that interfere with installation of new work may be cut with prior approval by the District. Roots must first be cut with a Vermeer, or equivalent, root cutter prior to any trenching.
 - (c) Where excavation for new construction is required within drip line of trees, hand excavation shall be employed to minimize damage to root system. Roots shall be relocated in backfill areas wherever possible. If encountered immediately adjacent to location of new construction, roots shall be cut approximately 6 inches back from new construction.
 - (d) Approved excavations shall be carefully backfilled with the excavated materials approved for backfilling. Backfill shall conform to adjacent grades without dips, sunken areas, humps, or other surface irregularities. Do not use mechanical equipment to compact backfill. Tamp carefully using hand tools, refilling and tamping until Final Acceptance as necessary to offset settlement.
 - (e) Exposed roots shall not be allowed to dry out before permanent backfill is placed. Temporary earth cover shall be provided, or roots shall be wrapped with four layers of wet, untreated burlap and temporarily supported and protected from damage until permanently relocated and covered with backfill.
 - (f) Accidentally broken roots should be sawed cleanly 3 inches behind ragged end.

1.05 SECURITY:

The Contractor shall be responsible for project security for materials, tools, equipment, supplies, and completed and partially completed Work.

1.06 TEMPORARY CONTROLS:

A. Noise Control:

- (1) Contractor acknowledges that adjacent facilities may remain in operation during all or a portion of the Work period, and it shall take all reasonable precautions to minimize noise as required by applicable laws and the Contract Documents.
- (2) Notice of proposed noisy operations, including without limitation, operation of pneumatic demolition tools, concrete saws, and other equipment, shall be submitted to the District a minimum of forty-eight (48) hours in advance of their performance.

B. Noise and Vibration:

- (1) Equipment and impact tools shall have intake and exhaust mufflers.
- (2) Contractor shall cooperate with District to minimize and/or cease the use of noisy and vibratory equipment if that equipment becomes objectionable by its longevity.

C. Dust and Dirt:

- (1) Contractor shall conduct demolition and construction operations to minimize the generation of dust and dirt, and prevent dust and dirt from interfering with the progress of the Work and from accumulating in the Work and adjacent areas including, without limitation, occupied facilities.
- (2) Contractor shall periodically water exterior demolition and construction areas to minimize the generation of dust and dirt.
- (3) Contractor shall ensure that all hauling equipment and trucks carrying loads of soil and debris shall have their loads sprayed with water or covered with tarpaulins, and as otherwise required by local and state ordinance.
- (4) Contractor shall prevent dust and dirt from accumulating on walks, roadways, parking areas, and planting, and from washing into sewer and storm drain lines.

D. Water:

- (1) Contractor shall not permit surface and subsurface water, and other liquids, to accumulate in or about the vicinity of the Premises. Should accumulation develop, Contractor shall control the water or other liquid, and suitably dispose of it by means of temporary pumps, piping, drainage lines, troughs, ditches, dams, or other methods.

E. Pollution:

- (1) No burning of refuse, debris, or other materials shall be permitted on or in the vicinity of the Premises.
- (2) Contractor shall comply with applicable regulatory requirements and anti-pollution ordinances during the conduct of the Work including, without limitation, demolition, construction, and disposal operations.

F. Lighting:

- (1) If portable lights are used after dark, all light must be located so as not to direct light into neighboring property.

1.07 PUBLICITY RELEASES:

- A. Contractor shall not release any information, story, photograph, plan, or drawing relating information about the Project to anyone, including press and other public communications medium, including, without limitation, on website(s) without the written permission of the District.

PART 2 – PRODUCTS Not used.

PART 3 – EXECUTION Not used.

END OF DOCUMENT

CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions;
- B. Special Conditions; and
- C. Temporary Facilities and Controls.

1.02 SECTION INCLUDES:

- A. Administrative and procedural requirements for the following:
 - (1) Salvaging non-hazardous construction waste.
 - (2) Recycling non-hazardous construction waste.
 - (3) Disposing of non-hazardous construction waste.

1.03 DEFINITIONS:

- A. Construction Waste: Building and site improvement materials and other solid waste resulting from construction, remodeling, renovation, or repair operations. Construction waste includes packaging.
- B. Demolition Waste: Building and site improvement materials resulting from demolition or selective demolition operations.
- C. Disposal: Removal off-site of demolition and construction waste and subsequent sale, recycling, reuse, or deposit in landfill or incinerator acceptable to authorities having jurisdiction.
- D. Recycle: Recovery of demolition or construction waste for subsequent processing in preparation for reuse.
- E. Salvage: Recovery of demolition or construction waste and subsequent sale or reuse in another facility.
- F. Salvage and Reuse: Recovery of demolition or construction waste and subsequent incorporation into the Work.

1.04 PERFORMANCE REQUIREMENTS:

- A. General: Develop waste management plan that results in end-of Project rates for salvage/recycling of sixty-five percent (65%) by weight (or by volume, but not a combination) of total waste generated by the Work.

1.05 SUBMITTALS:

- A. Waste Management Plan: Submit waste management plan within 30 days of date established for commencement of the Work.
- B. Waste Reduction Progress Reports: Concurrent with each Application for Payment, submit copies of report. Include the following information:
 - (1) Material category.
 - (2) Generation point of waste.
 - (3) Total quantity of waste in tons or cubic yards.
 - (4) Quantity of waste salvaged, both estimated and actual in tons or cubic yards.
 - (5) Quantity of waste recycled, both estimated and actual in tons or cubic yards.
 - (6) Total quantity of waste recovered (salvaged plus recycled) in tons or cubic yards.
 - (7) Total quantity of waste recovered (salvaged plus recycled) as a percentage of total waste.
- C. Waste Reduction Calculations: Before request for final payment, submit copies of calculated end-of-Project rates for salvage, recycling, and disposal as a percentage of total waste generated by the Work.
- D. Records of Donations: Indicate receipt and acceptance of salvageable waste donated to individuals and organizations. Indicate whether organization is tax exempt.
- E. Records of Sales: Indicate receipt and acceptance of salvageable waste sold to individuals and organizations. Indicate whether organization is tax exempt.
- F. Recycling and Processing Facility Records: Indicate receipt and acceptance of recyclable waste by recycling and processing facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.
- G. Landfill and Incinerator Disposal Records: Indicate receipt and acceptance of waste by landfills and incinerator facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.

- H. Qualification Data: For Waste Management Coordinator.
- I. Submittal procedures and quantities are specified in Document 01 33 00.

1.06 QUALITY ASSURANCE:

- A. Waste Management Coordinator Qualifications: LEED Accredited Professional by U.S. Green Building Council.
- B. Regulatory Requirements: Comply with hauling and disposal regulations of authorities having jurisdiction.
- C. Waste Management Conference: Conduct conference at Project site to comply with requirements. Review methods and procedures related to waste management including, but not limited to, the following:
 - (1) Review and discuss waste management plan including responsibilities of Waste Management Coordinator.
 - (2) Review requirements for documenting quantities of each type of waste and its disposition.
 - (3) Review and finalize procedures for materials separation and verify availability of containers and bins needed to avoid delays.
 - (4) Review procedures for periodic waste collection and transportation to recycling and disposal facilities.
 - (5) Review waste management requirements for each trade.

1.07 WASTE MANAGEMENT PLAN:

- A. General: Develop plan consisting of waste identification, waste reduction work plan, and cost/revenue analysis. Indicate quantities by weight or volume, but use same units of measurement throughout waste management plan.
- B. Waste Identification: Indicate anticipated types and quantities of site-clearing and construction waste generated by the Work. Include estimated quantities and assumptions for estimates.
- C. Waste Reduction Work Plan: List each type of waste and whether it will be salvaged, recycled, or disposed of in landfill or incinerator. Include points of waste generation, total quantity of each type of waste, quantity for each means of recovery, and handling and transportation procedures.
 - (1) Salvaged Materials for Reuse: For materials that will be salvaged and reused in this Project, describe methods for preparing salvaged materials before incorporation into the Work.

- (2) Salvaged Materials for Sale: For materials that will be sold to individuals and organizations, include list of their names, addresses, and telephone numbers.
- (3) Salvaged Materials for Donation: For materials that will be donated to individuals and organizations, include list of their names, addresses, and telephone numbers.
- (4) Recycled Materials: Include list of local receivers and processors and type of recycled materials each will accept. Include names, addresses, and telephone numbers.
- (5) Disposed Materials: Indicate how and where materials will be disposed of. Include name, address, and telephone number of each landfill and incinerator facility.
- (6) Handling and Transportation Procedures: Include method that will be used for separating recyclable waste including sizes of containers, container labeling, and designated location on Project site where materials separation will be located.

PART 2 - PRODUCTS Not Used.

PART 3 - EXECUTION

3.01 PLAN IMPLEMENTATION:

- A. General: Implement approved waste management plan. Provide handling, containers, storage, signage, transportation, and other items as required to implement waste management plan during the entire duration of the Contract.
 - (1) Comply with Document 01 50 00 for operation, termination, and removal requirements.
- B. Training: Train workers, subcontractors, and suppliers on proper waste management procedures, as appropriate for the Work occurring at Project site.
 - (1) Distribute waste management plan to everyone concerned within 3 days of submittal return.
 - (2) Distribute waste management plan to entities when they first begin work on site. Review plan procedures and locations established for salvage, recycling, and disposal.
- C. Site Access and Temporary Controls: Conduct waste management operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.

- (1) Designate and label specific areas of Project site necessary for separating materials that are to be salvaged, recycled, reused, donated, and sold.
- (2) Comply with Document 01 50 00 for controlling dust and dirt, environmental protection, and noise control.

3.02 RECYCLING CONSTRUCTION WASTE:

- A. General: Recycle paper and beverage containers used by on-site workers.
- B. Recycling Incentives: Revenues, savings, rebates, tax credits, and other incentives received for recycling waste materials shall accrue to the Contractor.
- C. Procedures: Separate recyclable waste from other waste materials, trash, and debris. Separate recyclable waste by type at Project site to the maximum extent practical.
 - (1) Provide appropriately marked containers or bins for controlling recyclable waste until they are removed from Project Site. Include list of acceptable and unacceptable materials at each container and bin.
 - (a) Inspect containers and bins for contamination and remove contaminated materials if found.
 - (2) Stockpile processed materials on site without intermixing with other materials. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
 - (3) Stockpile materials away from construction area. Do not store within drip line of remaining trees.
 - (4) Store components off the ground and protect from the weather.
 - (5) Remove recyclable waste off District property and transport to recycling receiver or processor.
- D. Packaging:
 - (1) Cardboard and Boxes: Break down packaging into flat sheets. Bundle and store in a dry location.
 - (2) Polystyrene Packaging: Separate and bag material.
 - (3) Pallets: As much as possible, require deliveries using pallets to remove pallets from Project Site. For pallets that remain on Site, break down pallets into component wood pieces and comply with requirements for recycling wood.
 - (4) Crates: Break down crates into component wood pieces and comply with requirements for recycling wood.

- E. Site-Clearing Wastes: Chip brush, branches, and trees on site.
- F. Wood Materials:
 - (1) Clean Cut-Offs of Lumber: Grind or chip into small pieces.
 - (2) Clean Sawdust: Bag sawdust that does not contain painted or treated wood.

3.03 DISPOSAL OF WASTE:

- A. General: Except for items or materials to be salvaged, recycled, or otherwise reused, remove waste materials from Project Site and legally dispose of them in a landfill or incinerator acceptable to authorities having jurisdiction.
 - (1) Except as otherwise specified, do not allow waste materials that are to be disposed of accumulate on site.
 - (2) Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
- B. Burning: Do not burn waste materials.
- C. Disposal: Transport waste materials off District property and legally dispose of them.

END OF DOCUMENT

FIELD OFFICES

PART 1 – GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions;
- B. Special Conditions; and
- C. Temporary Facilities and Controls.

1.02 SECTION INCLUDES:

- A. Requirements for Field Offices and Field Office Trailers.

1.03 SUMMARY:

- A. General: Contractor shall provide District's Field Office Trailer and contents, for District's use exclusively, during the term of the Contract.
- B. Property: Trailer, furniture, furnishings, equipment, and the like, supplied by the Contractor with the Office Trailer shall remain the property of the Contractor; District property items installed, delivered, and the like by District within the Office Trailer will remain District's property.
- C. Modifications: District reserves the right to modify the trailer or contents, or both, as may be deemed proper by District.
- D. Condition: Trailer and contents shall be clean, neat, substantially finished, in good, proper, and safe condition for use, operation, and the like; the trailer and contents shall not be required to be new.
- E. Installation Timing: Provide safe, fully furnished, functional, proper, complete, and finished trailer properly ready for entire use, within fourteen (14) calendar days of District's notification of the issuance of Notice to Proceed.

1.04 SUBMITTALS:

- A. General: Submit submittals to District in quantity, format, type, and the like, as specified herein.
- B. Office Trailer Data: One (1) copy of manufacturer's descriptive data, technical descriptions, regulatory compliance, industry standards, installation, removal, and maintenance instructions.

- C. Equipment Data: Two (2) copies of manufacturer data for each type of equipment, if directed by District.
- D. Furniture and Furnishings Data: Two (2) copies of manufacturer data for each type of equipment, if directed by District.
- E. Plans: One (1) reproducible copy of appropriately scaled plans of trailer layout. Plans shall include, but not be limited to: lighting; furniture; equipment; telephone and electrical outlets; and the like.
- F. Product Samples: One (1) complete and entire unit of each type, if directed by District.

1.05 QUALITY ASSURANCE

- A. Standards: In the event that provisions of codes, regulations, safety orders, Contract Documents, referenced manufacturer's specifications, manufacturer's instructions, industry standards, and the like, are in conflict, the more restrictive and higher quality shall govern.
- B. Installer: Installer or Installers engaged by Contractor must have a minimum of five (5) years of documented and properly authenticated successful experience of specialization in the installation of the items or systems, or both, specified herein.
- C. Manufacturer: Contractor shall obtain products from nationally and industry recognized Manufacturer with five (5) years minimum, of immediately recent, continuous, documented and properly authenticated successful experience of specialization in the manufacture of the product specified herein.
- D. State Personnel Training: Provide proper training for maintenance and operations, including emergency procedures, and the like, as directed by District.
- E. Units: Shall be sound and free of defects, and shall not include any damage or defect that will impair the safety, installation, performance, or the durability of the entire Office Trailer and appurtenant systems.

1.06 REGULATORY REQUIREMENTS

- A. General: Work shall be executed in accordance with applicable Codes, Regulations, Statutes, Enactments, Rulings, Laws, each authority having jurisdiction, and including, but not limited to, Regulatory Requirements specified herein.
- B. California Building Standards Code ("CBSC").
- C. California Code of Regulations, Title 25, Chapter 3, Sub Chapter 2, Article 3 ("CCR").
- D. Coach Insignia: Trailer shall display California Commercial Coach Insignia; such insignia shall be deemed to show that the trailer is in accordance with the Construction and Fire Safety requirements of CCR.

PART 2 – PRODUCTS

2.01 FIELD OFFICE TRAILER

- A. General: Provide entire Field Office Trailer of type, function, operation, capacity, size, complete with controls, safety devices, accessories, and the like, for proper and durable installation. Partitions, walls, ceiling, and other interior and exterior surfaces shall be appropriately finished, including, but not limited to, trim, painting, wall base, floor covering, suspended or similar ceiling, and the like; provide systems, components, units, nuts, bolts, screws, anchoring devices, fastening devices, washers, accessories, adhesives, sealants, and other items of type, grade, and class required for the particular use, not identified but required for a complete, weather-tight, appropriately operating, and finished installation.
- B. Manufacturers: General Electric Capital Modular Space; The Space Place, Inc.; or equal.
- C. Program: Provide a wheel-mounted trailer with stairs, landings, platforms, ramps, and the like, in good, proper, safe, clean, and properly finished condition; with proper heavy duty locks, and other proper and effective security at all doors, windows, and the like. Trailer shall be maintained in good, proper, safe, clean, and properly finished condition during the Contract.
 - (1) Nominal Trailer Size: Four hundred eighty (480) square feet, minimum.
 - (2) Stairs, Platform: Properly finished stairs, platforms, and ramps.
 - (3) Doors: Two (2), three (3) foot wide exterior doors with locksets; finished ramp, steps, and entry platform at each exterior door.
 - (4) Keys: Submit five (5) keys for each door, window, furniture unit, and the like. There shall be no other key copies or originals available; each key shall be identified for District; and shall be labeled, or tagged
 - (5) Lighting: Sixty-five (65) foot-candles illumination minimum at any point, at thirty (30) inches above finished floor throughout from fluorescent light source, exclusively, or as directed by District.
 - (6) Electrical Outlets: One (1) duplex outlet evenly spaced every twelve (12) linear horizontal feet of wall face, and electrical service ready for use.

2.02 FIELD OFFICE TRAILER ITEMS

- A. General: Provide the Field Office Trailer with the following arranged into two (2) workstations:
 - (1) Desks: Two (2) desks: thirty-six (36) inches by sixty (60) inches; steel, laminated plastic top; locking, one (1) or two (2) file drawers single pedestal; steel; provide five (5) keys to District.

- (2) Tables: Two (2) tables; thirty-six (36) inches by sixty (60) inches; twenty-nine (29) inches high; steel, laminated plastic top tables; one (1) at each desk.
 - (3) Chairs: Two (2) chairs: swivel; steel; with seat cushion and arms; one (1) at each desk.
 - (4) Waste Baskets: Two (2) waste baskets, one at each desk.
- B. Furniture and Equipment: Provide in the space located to effect efficient and logical use.
- (1) File cabinet: One (1); four (4) drawer; lateral; steel locking.
 - (2) Plan Table: One (1) plan table: thirty-six (36) inches deep by seventy-two (72) inches wide by forty-two (42) inches high; adjustable; wood or steel; with lockable plan and pencil drawers.
 - (3) Drafting Stool: One (1) drafting stool; swiveling; steel; padded; adjustable; with footrest and casters.
 - (4) Bookshelf: One (1) bookshelf: thirty-six (36) inches deep by seventy-two (72) inches wide by forty-two (42) inches high; adjustable; wood or steel; with lockable plan and pencil drawer.
 - (5) Plan Rack: One (1) wheel mounted plan rack.
 - (6) Waste Baskets: One (1) large waste basket.
 - (7) Coat/Hat Hanger: Wall mounted with minimum capacity for four (4) garments and ten (10) hats.
 - (8) Document Management System: Shall include an integrated high-volume printer, copier, and facsimile machine, including stand, base, and storage cabinet; and shall include the following features:
 - (a) Type: Laser, dry electrostatic transfer, plain paper, digital, multi-function imaging system.
 - (b) Network: Ethernet or Token Ring network ready, Plug-and-Play.
 - (c) Print, send/receive facsimile from any connected workstation.
 - (d) Resolution: Six hundred (600) dots per inch by six hundred (600) dots per inch, minimum.
 - (e) Print Speed: Twenty (20) pages per minute, minimum.
 - (f) Copies: Twenty (20) copies per minute, minimum.
 - (g) Document Handler: Forty (40) sheet, minimum

- (h) Collator: Forty (40) bin, minimum, with stapling.
- (i) Duplexing: Capable.
- (j) Paper Size: Capable of handling paper sizes to eleven (11) inches by seventeen (17) inches.
- (k) Paper Cassettes: One (1) each for eight and one half (8.5) inches by eleven (11) inches, eight and one half (8.5) inches by fourteen (14) inches, and eleven (11) inches by seventeen (17) inches paper sizes; minimum two hundred fifty (250) sheets per cassette.
- (l) Reduction/Enlargement: Capable of reduction to twenty-five percent (25%) and enlargement to two hundred percent (200%).
- (m) Facsimile Electronic Storage: Capable of storing minimum of fifty (50) speed dial numbers, group faxing and broadcast faxing.
- (n) Facsimile Scanning: Capable of scanning into memory a minimum of one hundred (100) pages with maximum scan time of three (3) seconds per page.
- (o) Halftone: Sixty-four (64) levels.
- (p) Redial: Automatic and Manual.
- (9) Maintenance: Contractor shall purchase service agreements for each unit of equipment for the duration of the project plus two (2) months, and shall maintain all equipment in proper working condition. Service agreements shall include provision for replacement of toner cartridges and other items required to effect proper unit use. Service agreements shall also provide for:
 - (a) Unlimited Service Calls.
 - (b) Same Day Response.
 - (c) All parts, labor, preventative maintenance and mileage.
 - (d) All chemicals, such as toner, fixing agent, and the like.
 - (e) System training and setup.
- (10) Portable Toilets: Two (2); each shall include a urinal; each unit shall be a properly enclosed chemical unit conforming to ANSI Z4.3.
 - (a) Location: As directed by District.
 - (b) Maintenance: Maintain each unit and surrounding areas in a clean, hygienic and orderly manner, at all time. Empty, clean,

and sanitize each unit each day at a location and time as directed by District.

- (c) Removal: Relocate, or remove from the site, each Portable Toilet. Upon such directive by District, the Contractor shall forthwith relocate or remove each Portable Toilet and submit the affected areas to a condition which existed prior to the installation of each Portable Toilet, within three (3) calendar days, or as directed by District in writing, at no cost to District.

2.03 UTILITY AND SERVICES

- A. Telephone Service: Contractor shall provide and interface the entire telephone service, and shall properly and timely pay for telephone service for District's non-long-distance use.
- B. Electrical Service: Provide all proper connections and continuously pay for service for the duration of the Work.

2.04 FINISHES

- A. General: Manufacturer standard finish system over surfaces properly cleaned, pretreated, and prepared to obtain proper bond; all visible surfaces shall be coated.
- B. Finish: Color as selected by District from manufacturer standard palette.

PART 3 – EXECUTION

3.01 INSTALLATION

- A. General: Properly prepare area and affected items to receive the Work. Set Work accurately in location, alignment, and elevation; rigidly, securely, and firmly anchor to appropriate structure; install plumb, straight, square, level, true, without racking, rigidly anchored to proper solid blocking, substrate, and the like; provide appropriate type and quantity of reinforcements, fasteners, adhesives, self-adhesive and other tapes; lubricants, coatings, accessories, and the like, as required for a complete, structurally rigid, stable, sound, and appropriately finished installation, in accordance with manufacturer's published instructions, and as indicated. The more restrictive and higher quality requirement shall govern. Moving parts shall be properly secured, without binding, looseness, noise, and the like.
- B. Installation: Install in accordance with 25 CCR 3.2.3 and as directed by District; jack up trailer and level both ways; mount on proper concrete piers with all load off wheels; provide required tie down and accessories per Section 4368 of referenced CCR, and as directed by District.
- C. Rejected Work: Work, materials, unit, items, systems, and the like, not accepted by District shall be deemed rejected, and shall forthwith be removed and replaced with proper and new Work, materials, unit, items, systems, and the like at no cost to District.

- D. Standard: Comply with manufacturer's published instructions, or with instructions as shown or indicated; the more restrictive and higher quality requirement shall govern.
- E. Location: As directed by District.
- F. Fire Resistance: Construct and install in accordance with UL requirements.
- G. Maintenance: Contractor shall maintain trailer and adjacent areas in a safe, clean and hygienic condition throughout the duration of the Work, and as directed by District. Properly repair or replace furniture or other items, as directed by District. Properly remove unsafe, damaged, or broken furniture, or similar items, and replace with safe and proper items. Contractor shall pay cost of all services, repair, and maintenance, or replacement of each item.
- H. Janitorial Service: Provide professional janitorial services, including, but not limited to, trash, waste paper baskets, fill paper dispensers; clean and dust all furniture, files, and the like; sweep and mop resilient and similar flooring; and vacuum carpeting and similar flooring.
 - (1) Frequency: Two (2) times per week, minimum.
- I. Removal: Properly remove the Office Trailer and contents from the Site upon completion of the Contract, or as directed by District in writing. Forthwith properly patch and repair affected areas; replace damaged items with new items. Carefully and properly inventory, clean, pack, store, and protect District property; submit District property to District at a date, time and location as directed by District.

END OF DOCUMENT

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Protection for existing trees.
 - 2. Repair and replacement of damaged trees.

1.2 RELATED REQUIREMENTS

- A. Section 32 8000, Irrigation.
- B. Section 32 9000, Landscaping.

1.3 REFERENCES AND STANDARDS

- A. American National Standard Institute (ANSI) A300 Pruning Standards.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Submittal Procedures:
 - 1. Action Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
 - 2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.

1.5 ACTION SUBMITTALS

- A. Fenced Tree Protection Area Plan: Submit plan outlining trees listed by number to be protected and their groupings. Trees shall be grouped in their own Fenced Tree Protection Areas as shown in Drawings.
- B. Schedule of Activities Inside Tree Protection Area: Submit in writing a schedule, including any and all activity inside Fenced Tree Protection Areas. This schedule to include but not limited to the dates fences are initially installed, altered and dates of fence replacement. Intent of these provisions is that the Tree Protection Zones (TPZ) are fenced for the entire duration with only exceptions of short intervals or specifically defined construction activity needs. Revise schedule as directed.
- C. Mediation Plan: Submit mediation plan to keep existing trees and planting irrigated during construction.

1.6 CLOSEOUT SUBMITTALS

- A. Maintenance Plan: For replaced trees.

TEMPORARY TREE PROTECTION
SECTION 01 5639
3595001

PART 2 - PRODUCTS

2.1 GENERAL

- A. Use materials as specified; any deviation from the Specifications must first be approved by the Owner's Representative in writing.

2.2 MATERIALS

- A. Trunk Protection constructed of:
 - 1. 20-foot long 2x6 wood boards or length needed to protect the trunk if tree trunk is shorter than 20 feet in height.
 - 2. Metal wire. Gauge strong enough to tie the boards around the trunk of the tree.
- B. Tree Protection Zone Fencing:
 - 1. 6-foot-tall metal chain link construction fencing.
- C. Bark Mulch: Untreated, shredded cedar.

PART 3 - EXECUTION

3.1 GENERAL REQUIREMENTS FOR TREES BE RETAINED

- A. Maintain pre-existing moisture levels.
- B. Maintain areas inside the fenced tree protection area including lawn mowing, leaf removal, operation and repair of irrigation.
- C. Protect root systems from flooding, erosion, excessive watering and drying resulting from dewatering or other operations:
- D. Operations not Allowed:
 - 1. Run off or spillage of damaging materials in vicinity of root systems.
 - 2. Rinsing of tools or equipment under trees.
 - 3. Storage of materials, stockpile soil, park or drive vehicles within drip lines.
 - 4. Cutting, breaking skin or bark, or bruising roots or branches.
 - 5. Fires under and adjacent trees.
 - 6. Discharge exhaust under foliage.
 - 7. Securing cable, chain, or rope to trees.
 - 8. Change of grade within drip line of trees without Landscape Architect's approval.
 - 9. The use of lime.

3.2 TREE TRUNK PROTECTION

- A. Conform to requirements for trees to be retained, in accordance with article GENERAL REQUIREMENTS FOR TREES TO BE RETAINED.
- B. Install boards vertically around tree and bind together with wire to protect the bark 360 degrees around the entire tree prior to start of any demolition and construction. Boards are not to dig into bark.
- C. Major scaffold limbs may require plastic fencing to be wrapped around them for protection.

3.3 TREE DRIPLINE PROTECTION

- A. The Tree Protection Zone (TPZ) is a restricted area around the base of the tree with a radius of one foot (1') for every inch of tree trunk diameter or ten feet, which ever is greater, enclosed by 6' tall chain link fence unless otherwise directed.
- B. Signage designating the protection zone and penalties for violations shall be secured in prominent location on each protection fence.

3.4 TREE PROTECTION

- A. Duration: Tree protection shall be erected before demolition, grading, or any construction begins and remain in place until final inspection of the project.
- B. Conform to requirements for trees and plants to be retained, in accordance with article GENERAL REQUIREMENTS FOR TREES TO BE RETAINED.
- C. Construction shall not commence until approval of the Fenced Tree Protection Area Plan and Schedule of Activities Inside Tree Protection Area have been obtained from the Architect.
- D. Vehicle movement within the TPZ will only be allowed for construction equipment.
 - 1. Within dripline, apply 10-inch layer of mulch over geotextile fabric.
- E. Perform trenching operations within the TPZ of the tree so that:
 - 1. Digging shall be by hand using narrow trenching shovel.
 - 2. No roots larger than 2" diameter are cut and utilities are routed around or below them.
 - 3. Roots smaller than 2" diameter are cut with sharp tools, saws, loppers; not torn, chopped or broken.
- F. Where roots are exposed:
 - 1. Do not allow the roots to dry out.
 - 2. On the same day the excavation is made, provide temporary backfill to original grade at tree roots,

TEMPORARY TREE PROTECTION
SECTION 01 5639
3595001

3. Or cover roots with 4 layers of wet untreated burlap, made wet each day, including weekends.
- G. Roots larger than 3" in diameter are not to be cut without review and approval by an Arborist provided by Owner.

3.5 REPAIR AND REPLACEMENT OF TREES

- A. Repair or replace damaged trees as required or directed.
- B. Repair trees damaged by operations:
 1. within 24 hours of damage,
 2. to satisfaction of Landscape Architect,
 3. to ANSI A300 Pruning Standards.
- C. Replace repaired trees where repair has not restored them to health or aesthetics:
 1. within 6 months of request to replace,
 2. to the satisfaction of Landscape Architect,
 3. with replacement trees of a size and variety matching those that were removed,
- D. Replaced trees shall be maintained in good health and aesthetics for the duration of the project from installation.
 1. Submit comprehensive maintenance plan for replacement trees, including but not limited to provisions for irrigation system independent of existing system.
- E. Where suitable replacement of trees is not available:
 1. Submit affidavit to Landscape Architect that they are not available.
 2. Provide compensation to Owner at the following rates:
 - a. \$2000 for each caliper inch of tree removed under 12 inches.
 - b. \$4000 for each caliper inch of tree removed 12 inches or greater.
 - c. Caliper of trees measured at 6 inches above grade.
 - d. Caliper defined here as thickness of diameter, measured in inches.

3.6 SOIL CONTAMINATION

- A. Remove soil that has been contaminated during the performance of the Work by oil, solvents, and other materials which could be harmful to trees and plants.

TEMPORARY TREE PROTECTION
SECTION 01 5639
3595001

1. Replace with good soil in conformance with Section 31 0000, Earthwork, at Contractor's expense.

END OF SECTION

*p:\sacramento\3595 tracy unified school district\001-000_villalovoz es new shade structures\08 specifications\06 spec\04 final\freiler
- shade struct\01 5639_temporary tree protection.docx
New File: January 6, 2022*

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Requirements for preparing Storm Water Pollution Prevention Plan.

1.2 SCOPE OF WORK

A. General: Provide all materials, equipment and labor necessary to furnish and install straw wattles or silt fence barriers at locations shown on the Drawings and as required during construction.

B. The Contractor shall as a minimum address:

1. Cut and fill operations.
2. Temporary stockpiles.
3. Vehicle and equipment storage, maintenance and fueling operations.
4. Concrete, plaster, mortar and paint disposal.
5. Dust control.
6. Tracking of dirt, mud on off-site streets.
7. Pipe flushing.

1.3 ADMINISTRATIVE REQUIREMENTS

A. Submittal Procedures:

B. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures

1.4 QUALITY ASSURANCE

A. General: Comply with governing codes and regulations.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Straw Wattles: New manufactured straw roles in compliance with state requirements for sediment control.

B. Silt Fences: New manufactured silt fence in compliance with state requirements for sediment control.

C. Filter Bag: As required by local jurisdiction.

**EROSION CONTROL
SECTION 01 5713.10
3595001**

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Straw Wattles: Install per the drawings and/or as required.
- B. Silt Fences: Install per the Drawings and/or as required. Silt Fences shall not be used around inlets.
- C. Filter Bags: Installed as required by manufacturer's requirements.

3.2 MAINTENANCE AND REMOVAL:

- A. General: Maintain and repair existing and new erosion control facilities throughout the construction period. Remove silt build up at straw wattles and/or silt fences as needed. Repair damage to earth slopes and banks. Erosion control measures shall be left in place until final paving and landscaping are complete.
- B. Monitoring: Provide monitoring of erosion control measures before and after storm events.
- C. Cleaning: Keep area clean of debris.
- D. Remove erosion control measures prior to placing finish landscaping.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: VOC restrictions for product categories listed below under Article "DEFINITIONS" and in compliance with the following.
 - 1. California Code of Regulations, Title 24, Part 11 California Green Building Standards Code.
 - 2. Local Agency Division of the State Architect.
 - 3. No Rating System is applicable.
- B. Products of each category that are installed in the project must comply; applicable laws and ordinances do not allow for partial compliance.
- C. Listing of a product in these Specifications shall not be construed as a solicitation or requirement to use any product or combination of products in violation of the requirements of South Coast Air Quality Management District Rule No.1168, as described in Rule 1168(g).
 - 1. If a listed product does not meet the requirements of this rule, request approval for use of an alternate product by the same or another manufacturer meeting the requirements of this rule.
 - 2. Do not use products which do not meet the requirements of this rule.

1.2 RELATED REQUIREMENTS

- A. Divisions 01 through 33 contain related requirements specific to the work of each of these Sections. Requirements may or may not include reference to this Section.
- B. Section 01 8113, Sustainable Design Requirements, for CAL-Green general requirements and procedures.

1.3 REFERENCES

- A. California Green Building Standards Code (CALGreen), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. Low-Emitting Materials Product List; California Collaborative for High Performance Schools (CHPS); current edition at www.chps.net/.
- C. CRI (GLCC) - Green Label Testing Program - Approved Product Categories for Carpet Cushion; Carpet and Rug Institute; current edition.
- D. CRI (GLP) - Green Label Plus Carpet Testing Program - Approved Products; Carpet and Rug Institute; current edition.
- E. GEI (SCH) - GREENGUARD "Children and Schools" Certified Products; GREENGUARD Environmental Institute; current listings at www.greenguard.org.

VOLATILE ORGANIC COMPOUND (VOC) RESTRICTIONS

SECTION 01 6116.10

3595001

- F. GreenSeal GS-36 - Commercial Adhesives; Green Seal, Inc.
- G. SCAQMD 1168 - South Coast Air Quality Management District Rule No.1168; current edition; www.aqmd.gov.
- H. SCS (CPD) - SCS Certified Products; Scientific Certification Systems; current listings at www.scs-certified.com.

1.4 DEFINITIONS

- A. VOC-Restricted Products: Products of each of the following categories when installed or applied on-site:
 - 1. Adhesives, sealants, and sealer coatings, regardless of specification Section or Division.
 - 2. Paints and coatings.
 - 3. Carpet and resilient flooring.
 - 4. Composite wood products; plywood, particleboard, wood fiberboard.
- B. Adhesives: Gunnable, trowelable, liquid-applied, and aerosol adhesives, whether specified or not; including flooring adhesives, resilient base adhesives, and pipe jointing adhesives.
- C. Sealants: Gunnable, trowelable, and liquid-applied joint sealants and sealant primers, whether specified or not; including firestopping sealants and duct joint sealers.

1.5 SUBMITTAL REQUIREMENTS

- A. Product Data: For each VOC-restricted product used in the project, submit product data showing compliance, except when another type of evidence of compliance is required.
- B. Verification of Compliance: Submit for each different product in each applicable category.
 - 1. Identify evidence submittals with the words "CALGreen VOC Compliance Report".
- C. Installer Certifications for Accessory Materials:
 - 1. Require each installer of any type of product, not just the products for which VOC restrictions are specified, to certify that either 1) no adhesives, joint sealants, paints, coatings, or composite wood or agrifiber products have been used in the installation of their products, or 2) that such products used comply with these requirements.
 - 2. Use the form following at the end of Part 3 in this Section for Installer certifications.

1.6 QUALITY ASSURANCE

- A. Manufacturer's Testing Agency Qualifications: Independent firm specializing in performing testing and inspections of the type specified in this Section.

PART 2 - PRODUCTS

2.1 MATERIALS

A. General:

1. Provide products conforming to local, State and Federal government requirements limiting the amount of volatile organic compounds contained in the product, for its intended application. If specified product exceeds current requirement, provide conforming product at no additional cost.
2. Provide only products having volatile organic compound (VOC) content not greater than required by South Coast Air Quality Management District Rule No.1168 and less where required by code.
3. Products are specified in multiple Sections throughout these Specifications.

B. Adhesives, Including Carpet and Cushion Adhesives: Comply with CALGreen Section 5.504 and Table 5.504.4.1.

1. Verification of Compliance: Acceptable types are:
 - a. Report of laboratory testing performed in accordance with requirements.
 - b. Published product data showing compliance with requirements.
 - c. Certification by manufacturer that product complies with requirements.
2. Aerosol Adhesives: Comply with Table 5.504.4.1 of CalGreen Section 5.504, and California Code of Regulations Title 17, Section 94507.
 - a. Verification of Compliance: Acceptable types are:
 - 1) Current GreenSeal Certification.
 - 2) Report of laboratory testing performed in accordance with GreenSeal GS-36 requirements.
 - 3) Published product data showing compliance with requirements.
3. Products used shall comply with the following limits.

Table 5.504.4.1 ADHESIVE VOC LIMIT	
Architectural Applications	Current VOC Limit
Indoor Carpet Adhesives	50
Carpet Pad Adhesives	50
Outdoor Carpet Adhesives	150
Wood Flooring Adhesive	100
Rubber Floor Adhesives	60
Subfloor Adhesives	50
Ceramic Tile Adhesives	65
VCT and Asphalt Tile Adhesives	50
Dry Wall and Panel Adhesives	50
Cove Base Adhesives	50
Multipurpose Construction Adhesives	70
Structural Glazing Adhesives	100

VOLATILE ORGANIC COMPOUND (VOC) RESTRICTIONS**SECTION 01 6116.10****3595001**

Table 5.504.4.1 ADHESIVE VOC LIMIT	
Single Ply Roof Membrane Adhesives	250
Other adhesives not specifically listed	250
VOC Limits and Effective Dates**	
Specialty Applications	Current VOC Limit
PVC Welding	510
CPVC Welding	490
ABS Welding	325
Plastic Cement Welding	250
Adhesive Primer for Plastic	550
Contact Adhesive	80
Special Purpose Contact Adhesive	250
Structural Wood Member Adhesive	140
Top and Trim Adhesive	250
** The specified limits remain in effect unless revised limits are listed in the current governing edition of CalGreen.	
For adhesives, adhesive bonding primers, or any other primer not regulated by the above two Tables and applied to the following substrates, the following limits shall apply:	
Substrate Specific Applications	Current VOC Limit
Metal to Metal	30
Plastic Foams	50
Porous Material (except wood)	50
Wood	30
Fiberglass 80	80
Note: If an adhesive is used to bond dissimilar substrates together the adhesive with the highest VOC content shall be allowed.	

C. Joint Sealants: Comply with CALGreen Section 5.504 and Table 5.504.4.2.

1. Verification of Compliance: Acceptable types are:
 - a. Report of laboratory testing performed in accordance with requirements.
 - b. Published product data showing compliance with requirements.
 - c. Certification by manufacturer that product complies with requirements.
2. Products used shall comply with the following limits.

Table 5.504.4.2 SEALANT VOC LIMIT	
Less Water and Less Exempt Compounds in Grams per Liter	
Sealant	Current VOC Limit
Architectural	250
Marine Deck	760
Non-Membrane Roof	300
Roadway	250
Single-Ply Roof Membrane	450

VOLATILE ORGANIC COMPOUND (VOC) RESTRICTIONS**SECTION 01 6116.10****3595001**

Table 5.504.4.2 SEALANT VOC LIMIT	
Less Water and Less Exempt Compounds in Grams per Liter	
Other	420
Sealant Primers	Current VOC Limit
Architectural	
Non-Porous	250
Porous	775
Modified Bituminous	500
Marine Deck	760
Other	750
For low-solid adhesives or sealants the VOC limit is expressed in grams per liter of material; for all other adhesives and sealants, VOC limits are expressed as grams of VOC per liter of adhesive or sealant less water and less exempt compounds.	

- D. Paints and Coatings: Comply with CALGreen Section 5.504 and Table 5.504.4.3 based on the California Air Resources Board, Architectural Coatings Suggested Control Measure.
1. Determination of VOC Content: Testing and calculation in accordance with 40 CFR 59, Subpart D (EPA Method 24), exclusive of colorants added to a tint base and water added at Project site; or other method acceptable to authorities having jurisdiction.
 - a. Verification of Compliance: Acceptable types are:
 - 1) Report of laboratory testing performed in accordance with requirements.
 - 2) Published product data showing compliance with requirements.
 - 3) Certification by manufacturer that product complies with requirements.
 2. Provide coatings that comply with the most stringent requirements specified in the following:
 - a. 40 CFR 59, Subpart D--National Volatile Organic Compound Emission Standards for Architectural Coatings.
 - b. South Coast Air Quality Management District Rule No.1168.
 3. Aerosol Paints and Coatings: Comply with CALGreen 5.504.4.3.1 and, for projects in the jurisdiction of BAAQMD, comply with VOC by weight of product limits of regulation 8, Rule 49.
 4. Products used shall comply with the following limits.

Table 5.504.4.3 VOC CONTENT LIMITS FOR ARCHITECTURAL COATINGS	
(See Notes 2 & 3 below)	
Grams of VOC per Liter of Coating, less water and less exempt compounds	
Coating Category	Current VOC Limit 1/1/2012
Flat Coatings	50

VOLATILE ORGANIC COMPOUND (VOC) RESTRICTIONS
SECTION 01 6116.10
3595001

Table 5.504.4.3 VOC CONTENT LIMITS FOR ARCHITECTURAL COATINGS (See Notes 2 & 3 below)	
Grams of VOC per Liter of Coating, less water and less exempt compounds	
Coating Category	Current VOC Limit 1/1/2012
Non-Flat Coatings	100
Non-Flat High Gloss Coatings	150
Specialty Coatings	
Aluminum Roof Coatings	400
Basement Specialty Coatings	400
Bituminous Roof Coatings	50
Bituminous Roof Primers	350
Bond Breakers	350
Concrete Curing Compounds	350
Concrete / Masonry Sealers	100
Driveway Sealers	50
Dry Fog Coatings	150
Faux Finishing Coatings	350
Fire Resistive Coatings	350
Floor Coatings	100
Form-Release Compounds	250
Graphic Arts Coatings (Sign Paints)	500
High-Temperature Coatings	420
Industrial Maintenance Coatings	250
Low Solids Coatings (See Note 1 below)	120
Magnesite Cement Coatings	450
Mastic Texture Coatings	100
Metallic Pigmented Coatings	500
Multicolor Coatings	250
Pretreatment Wash Primers	420
Primers, Sealers and Undercoaters	100
Reactive Penetrating Sealers	350
Recycled Coatings	250
Roof Coatings	50
Rust Preventative Coatings	250
Shellacs:	
Clear	730
Opaque	550
Specialty Primers, Sealers and Undercoaters	100
Stains	250
Stone Consolidants	450
Swimming Pool Coatings	340
Traffic Marking Coatings	100
Waterproofing Membranes	250
Wood Coatings	275
Wood Preservatives	350

VOLATILE ORGANIC COMPOUND (VOC) RESTRICTIONS
SECTION 01 6116.10
3595001

Table 5.504.4.3 VOC CONTENT LIMITS FOR ARCHITECTURAL COATINGS (See Notes 2 & 3 below)	
Grams of VOC per Liter of Coating, less water and less exempt compounds	
Coating Category	Current VOC Limit 1/1/2012
Zinc Rich Primers	340
Note 1: Grams of VOC per liter of coating including water and including exempt compounds	
Note 2: Not Applicable	
Note 3: Values in this table are derived from those specified by the California Air Resources Board, Architectural Coatings Suggested Control Measure, February 1, 2008. More information is available from the Air Resources Board.	

5. Restricted Components: In addition to the specified VOC limits, paints and coatings shall not contain any of the following:
- a. Acrolein.
 - b. Acrylonitrile.
 - c. Antimony.
 - d. Benzene.
 - e. Butyl benzyl phthalate.
 - f. Cadmium.
 - g. Di (2-ethylhexyl) phthalate.
 - h. Di-n-butyl phthalate.
 - i. Di-n-octyl phthalate.
 - j. 1,2-dichlorobenzene.
 - k. Diethyl phthalate.
 - l. Dimethyl phthalate.
 - m. Ethylbenzene.
 - n. Formaldehyde.
 - o. Hexavalent chromium.
 - p. Isophorone.
 - q. Lead.
 - r. Mercury.
 - s. Methyl ethyl ketone.
 - t. Methyl isobutyl ketone.
 - u. Methylene chloride.
 - v. Naphthalene.
 - w. Toluene (methylbenzene).
 - x. 1,1,1-trichloroethane.
 - y. Vinyl chloride.

VOLATILE ORGANIC COMPOUND (VOC) RESTRICTIONS
SECTION 01 6116.10
3595001

PART 3 - EXECUTION

3.1 FIELD QUALITY CONTROL

- A. Owner reserves the right to reject non-compliant products, whether installed or not, and require their removal and replacement with compliant products at no extra cost to Owner.
- B. Additional costs to restore indoor air quality, including fines by authorities, due to installation of non-compliant products shall be borne by Contractor.

3.2 CERTIFICATION FORM

- A. Use of this Form:
 - 1. Because installers are allowed and directed to choose accessory materials suitable for the applicable installation, there is a possibility that such accessory materials might contain VOC content in excess of that permitted, especially where such materials have not been explicitly specified.
 - 2. Contractor is required to obtain and submit this Form from each installer of work on this project.
 - 3. For each product category listed, circle the correct words in brackets: either [HAS] or [HAS NOT].
 - 4. If these accessory materials have been used, attach to this form product data and MSDS sheet for each such product.

(The Remainder of this Page is Intentionally Left Blank)

ACCESSORY MATERIAL VOC CONTENT CERTIFICATION FORM

IDENTIFICATION:

Project Name: _____

Project No.: _____

Architect: _____

PRODUCT CERTIFICATION: I certify that the installation work of my firm on this project:

1. [HAS] [HAS NOT] required the use of any ADHESIVES.
2. [HAS] [HAS NOT] required the use of any JOINT SEALANTS.
3. [HAS] [HAS NOT] required the use of any PAINTS OR COATINGS.
4. [HAS] [HAS NOT] required the use of any COMPOSITE WOOD or AGRIFIBER PRODUCTS.

Product data and MSDS sheets are attached.

CERTIFIED BY (Installer/Manufacturer/Supplier Firm):

Firm Name: _____

Print Name: _____

Signature: _____

Title: _____ (officer of company)

Date: _____

VOLATILE ORGANIC COMPOUND (VOC) RESTRICTIONS
SECTION 01 6116.10
3595001

END OF SECTION

*p:\sacramento\3595 tracy unified school district\001-000_villalovoz es new shade structures\08 specifications\06 spec\04 final\freiler
- shade struct\01 6116.10_volatile organic compound (voc) restrictions.docx
Last Updated: January 18, 2022*

SECTION 01 66 00

PRODUCT DELIVERY, STORAGE AND HANDLING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Site Access, Conditions and Requirements;
- B. Special Conditions.

1.02 PRODUCTS

- A. Products are as defined in the General Conditions.
- B. Contractor shall not use and/or reuse materials and/or equipment removed from existing Premises, except as specifically permitted by the Contract Documents.
- C. Contractor shall provide interchangeable components of the same manufacturer, for similar components.

1.03 TRANSPORTATION AND HANDLING

- A. Contractor shall transport and handle Products in accordance with manufacturer's instructions.
- B. Contractor shall promptly inspect shipments to confirm that Products comply with requirements, quantities are correct, and products are undamaged.
- C. Contractor shall provide equipment and personnel to handle Products by methods to prevent soiling, disfigurement, or damage.

1.04 STORAGE AND PROTECTION

- A. Contractor shall store and protect Products in accordance with manufacturer's instructions, with seals and labels intact and legible. Contractor shall store sensitive products in weather-tight, climate controlled enclosures.
- B. For exterior storage of fabricated Products, Contractor shall place on sloped supports, above ground.
- C. Contractor shall provide off-site storage and protection when Site does not permit on-site storage or protection.

- D. Contractor shall cover products subject to deterioration with impervious sheet covering and provide ventilation to avoid condensation.
- E. Contractor shall store loose granular materials on solid flat surfaces in a well-drained area and prevent mixing with foreign matter.
- F. Contractor shall provide equipment and personnel to store Products by methods to prevent soiling, disfigurement, or damage.
- G. Contractor shall arrange storage of Products to permit access for inspection and periodically inspect to assure Products are undamaged and are maintained under specified conditions.

PART 2 – PRODUCTS Not Used.

PART 3 - EXECUTION Not Used.

END OF DOCUMENT

FIELD ENGINEERING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Site Investigation, and Soils Investigation Report;
- B. Special Conditions;
- C. Site-Visit Certification.

1.02 REQUIREMENTS INCLUDED:

- A. Contractor shall provide and pay for field engineering services by a California-registered engineer, required for the project, including, without limitations:
 - (1) Survey work required in execution of the Project.
 - (2) Civil or other professional engineering services specified, or required to execute Contractor's construction methods.

1.03 QUALIFICATIONS OF SURVEYOR OR ENGINEERS:

Contractor shall only use a qualified licensed engineer or registered land surveyor, to whom District makes no objection.

1.04 SURVEY REFERENCE POINTS:

- A. Existing basic horizontal and vertical control points for the Project are those designated on the Drawings.
- B. Contractor shall locate and protect control points prior to starting Site Work and preserve all permanent reference points during construction. In addition Contractor shall:
 - (1) Make no changes or relocation without prior written notice to District and Architect.
 - (2) Report to District and Architect when any reference point is lost or destroyed, or requires relocation because of necessary changes in grades or locations.
 - (3) Require surveyor to replace Project control points based on original survey control that may be lost or destroyed.

1.05 RECORDS:

Contractor shall maintain a complete, accurate log of all control and survey work as it progresses.

1.06 SUBMITTALS:

- A. Contractor shall submit name and address of Surveyor and Professional Engineer to District and Architect prior to its/their work on the Project.
- B. On request of District and Architect, Contractor shall submit documentation to verify accuracy of field engineering work, at no additional cost to the District.
- C. Contractor shall submit a certificate signed by registered engineer or surveyor certifying that elevations and locations of improvements are in conformance or nonconformance with Contract Documents.

PART 2 – PRODUCTS Not Used.

PART 3 - EXECUTION

3.01 COMPLIANCE WITH LAWS:

Contractor is responsible for meeting all applicable codes, OSHA, safety and shoring requirements.

3.02 NONCONFORMING WORK:

Contractor is responsible for any re-surveying required by correction of nonconforming work.

END OF DOCUMENT

CUTTING AND PATCHING

PART 1 – GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Inspector, Inspections, and Tests, Integration of Work, Nonconforming Work, and Correction of Work, and Uncovering Work;
- B. Special Conditions;
- C. Imported Materials Certification.

1.02 CUTTING AND PATCHING:

- A. Contractor shall be responsible for all cutting, fitting, and patching, including associated excavation and backfill, required to complete the Work or to:
 - (1) Make several parts fit together properly.
 - (2) Uncover portions of Work to provide for installation of ill-timed Work.
 - (3) Remove and replace defective Work.
 - (4) Remove and replace Work not conforming to requirements of Contract Documents.
 - (5) Remove Samples of installed Work as specified for testing.
 - (6) Provide routine penetrations of non-structural surfaces for installation of piping and electrical conduit.
 - (7) Attaching new materials to existing remodeling areas – including painting (or other finishes) to match existing conditions.
- B. In addition to Contract requirements, upon written instructions from the District, Contractor shall uncover Work to provide for observations of covered Work in accordance with the Contract Documents; remove samples of installed materials for testing as directed by District; and remove Work to provide for alteration of existing Work.
- C. Contractor shall not cut or alter Work, or any part of it, in such a way that endangers or compromises the integrity of the Work, the Project, or work of others.

1.03 SUBMITTALS:

- A. Prior to any cutting or alterations that may affect the structural safety of Project, or work of others, and well in advance of executing such cutting or alterations, Contractor shall submit written notice to District pursuant to the applicable notice provisions of the Contract Documents, requesting consent to proceed with the cutting or alteration, including the following:
 - (1) The work of the District or other trades.
 - (2) Structural value or integrity of any element of Project.
 - (3) Integrity or effectiveness of weather-exposed or weather-resistant elements or systems.
 - (4) Efficiency, operational life, maintenance or safety of operational elements.
 - (5) Visual qualities of sight-exposed elements.
- B. Contractor's Request shall also include:
 - (1) Identification of Project.
 - (2) Description of affected Work.
 - (3) Necessity for cutting, alteration, or excavations.
 - (4) Effects of Work on District, other trades, or structural or weatherproof integrity of Project.
 - (5) Description of proposed Work:
 - (a) Scope of cutting, patching, alteration, or excavation.
 - (b) Trades that will execute Work.
 - (c) Products proposed to be used.
 - (d) Extent of refinishing to be done.
 - (6) Alternates to cutting and patching.
 - (7) Cost proposal, when applicable.
 - (8) The scheduled date the Contractor intends to perform the Work and the duration of time to complete the Work.
 - (9) Written permission of District or other District contractor(s) whose work will be affected.

1.04 QUALITY ASSURANCE:

- A. Contractor shall ensure that cutting, fitting, and patching shall achieve security, strength, weather protection, appearance for aesthetic match, efficiency, operational life, maintenance, safety of operational elements, and the continuity of existing fire ratings.
- B. Contractor shall ensure that cutting, fitting, and patching shall successfully duplicate undisturbed adjacent profiles, materials, textures, finishes, colors, and that materials shall match existing construction. Where there is dispute as to whether duplication is successful or has been achieved to a reasonable degree, the District's decision shall be final.

1.05 PAYMENT FOR COSTS:

- A. Cost caused by ill-timed or defective Work or Work not conforming to Contract Documents, including costs for additional services of the District, its consultants, including but not limited to the Construction Manager, the Architect, the Project Inspector(s), Engineers, and Agents, will be paid by Contractor and/or deducted from the Contract by the District.
- B. District shall only pay for cost of Work if it is part of the original Contract Price or if a change has been made to the contract in compliance with the provisions of the General Conditions. Cost of Work performed upon instructions from the District, other than defective or nonconforming Work, will be paid by District on approval of written Change Order. Contractor shall provide written cost proposals prior to proceeding with cutting and patching.

PART 2 - PRODUCTS

2.01 MATERIALS:

- A. Contractor shall provide for replacement and restoration of Work removed. Contractor shall comply with the Contract Documents and with the Industry Standard(s), for the type of Work, and the Specification requirements for each specific product involved. If not specified, Contractor shall first recommend a product of a manufacturer or appropriate trade association for approval by the District.
- B. Materials to be cut and patched include those damaged by the performance of the Work.

PART 3 – EXECUTION

3.01 INSPECTION:

- A. Contractor shall inspect existing conditions of the Site and the Work, including elements subject to movement or damage during cutting and patching, excavating and backfilling. After uncovering Work, Contractor shall inspect conditions affecting installation of new products.

- B. Contractor shall report unsatisfactory or questionable conditions in writing to District as indicated in the General Conditions and shall proceed with Work as indicated in the General Conditions by District.

3.02 PREPARATION:

- A. Contractor shall provide shoring, bracing and supports as required to maintain structural integrity for all portions of the Project, including all requirements of the Project.
- B. Contractor shall provide devices and methods to protect other portions of Project from damage.
- C. Contractor shall, provide all necessary protection from weather and extremes of temperature and humidity for the Project, including without limitation, any work that may be exposed by cutting and patching Work. Contractor shall keep excavations free from water.

3.03 ERECTION, INSTALLATION AND APPLICATION:

- A. With respect to performance, Contractor shall:
 - (1) Execute fitting and adjustment of products to provide finished installation to comply with and match specified tolerances and finishes.
 - (2) Execute cutting and demolition by methods that will prevent damage to other Work, and provide proper surfaces to receive installation of repairs and new Work.
 - (3) Execute cutting, demolition excavating, and backfilling by methods that will prevent damage to other Work and damage from settlement.
- B. Contractor shall employ original installer or fabricator to perform cutting and patching for:
 - (1) Sight-exposed finished surfaces.
- C. Contractor shall execute fitting and adjustment of products to provide a finished installation to comply with specified products, functions, tolerances, and finishes as shown or specified in the Contract Documents including, without limitation, the Drawings and Specifications.
- D. Contractor shall fit Work airtight to pipes, sleeves, conduit, and other penetrations through surfaces. Contractor shall conform to all Code requirements for penetrations or the Drawings and Specifications, whichever calls for a higher quality or more thorough requirement. Contractor shall maintain integrity of both rated and non-rated fire walls, ceilings, floors, etc.
- E. Contractor shall restore Work which has been cut or removed. Contractor shall install new products to provide completed Work in accordance with requirements of the Contract Documents and as required to match surrounding areas and surfaces.

- F. Contractor shall refinish all continuous surfaces to nearest intersection as necessary to match the existing finish to any new finish.

END OF DOCUMENT

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes: Requirements and procedures for ensuring optimal diversion of construction waste materials generated by the Work from landfill disposal within the limits of the Construction Schedule and Contract Sum.
 - 1. The Work of this Contract requires that a minimum of **[65%]** by weight of the construction and demolition materials generated in the Work is diverted from landfill disposal through a combination of re-use and recycling activities.
 - 2. CAL-Green: Alternate waste reduction methods developed in cooperation with local agencies if diversion or recycle facilities capable of compliance with CAL-Green requirements do not exist within the haul boundary of the jobsite (California Code of Regulations, Title 24, Part 11, 5.408).
 - 3. **[LEED projects: Requirements for submittal of LEED documentation in compliance with Materials and Resources Credit 2.1 and Materials and Resources Credit 2.2, Construction Waste Management.]**
 - 4. Requirements for submittal of Contractor's Construction Waste and Recycling Plan prior to the commencement of the Work.
 - 5. Contractor's quantitative reports for construction waste materials as a condition of approval of progress payments submitted to the **[EDIT: Architect or Construction Manager]**

1.2 RELATED REQUIREMENTS

- A. Section 01 3516, Alteration Project Procedures.
- B. Section 01 5000, Temporary Facilities & Controls.
- C. Section 01 7329, Cutting and Patching.
- D. Section 01 8113, Sustainable Design Requirements, for CAL-Green general requirements and procedures.
- E. Section 02 2600, Hazardous Material Abatement (Various Materials).
- F. Section 02 2623, Asbestos Assessment.
- G. Section 02 2626, Lead Assessment.
- H. Section 02 2629, Hazardous Materials Assessment - PCB Ballast & Fluorescent Lamps.
- I. Section 02 4116, Building Demolition.
- J. Section 02 4119, Selective Demolition.
- K. Section 31 1000, Site Clearing.

CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL
SECTION 01 7419
3595001

1.3 REFERENCES AND STANDARDS

- A. California Green Building Standards Code (CALGreen), edition as noted on the drawings, as adopted by the California Division of the State Architect (DSA).

1.4 DEFINITIONS

- A. Class III Landfill: A landfill that accepts non-hazardous resources such as household, commercial, and industrial waste, resulting from construction, remodeling, repair, and demolition operations. A Class III landfill must have a solid waste facilities permit from the California Integrated Waste Management Board (CIWMB) and is regulated by the Enforcement Agency (EA).
- B. Construction and Demolition Debris: Building materials and solid waste resulting from construction, remodeling, repair, cleanup, or demolition operations that are not hazardous as defined in California Code of Regulations, Title 22, Section 66261.3 et seq. This term includes, but is not limited to, asphalt concrete, Portland cement concrete, brick, lumber, gypsum wallboard, cardboard and other associated packaging, roofing material, ceramic tile, carpeting, plastic pipe, and steel. The debris may be commingled with rock, soil, tree stumps, and other vegetative matter resulting from land clearing and landscaping for construction or land development projects.
- C. C&D Recycling Center: A facility that receives only construction and demolition debris material that has been separated for reuse prior to receipt, in which the residual (disposed) amount of waste in the material is less than 10% of the amount separated for reuse by weight.
- D. Disposal: Final deposition of construction and demolition or inert debris into land, including stockpiling onto land of construction and demolition debris that has not been sorted for further processing or resale, if such stockpiling is for a period of time greater than 30 days; and construction and demolition debris that has been sorted for further processing or resale, if such stockpiling is for a period of time greater than one year, or stockpiling onto land of inert debris that is for a period of time greater than one year.
- E. Enforcement Agency (EA): Enforcement agency is the authority having jurisdiction within the Project location.
- F. Inert Disposal Facility or Inert Waste Landfill: A disposal facility that accepts only inert waste such as soil and rock, fully cured asphalt paving, uncontaminated concrete (including fiberglass or steel reinforcing rods embedded in the concrete), brick, glass, and ceramics, for land disposal.
- G. Mixed Debris: Loads that include commingled recyclable and non-recyclable materials generated at the construction site.
- H. Mixed Debris Recycling Facility: A processing facility that accepts loads of commingled construction and demolition debris for the purpose of recovering re-usable and recyclable materials and disposing the non-recyclable residual materials.

CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL
SECTION 01 7419
3595001

- I. Recycling: The process of sorting, cleansing, treating and reconstituting materials for the purpose of using the altered form in the manufacture of a new product. Recycling does not include burning, incinerating or thermally destroying solid waste.
- J. Reuse. The use, in the same or similar form as it was produced, of a material which might otherwise be discarded.
- K. Separated for Reuse. Materials, including commingled recyclables, that have been separated or kept separate from the solid waste stream for the purpose of additional sorting or processing those materials for reuse or recycling in order to return them to the economic mainstream in the form of raw material for new, reused, or reconstituted products which meet the quality standards necessary to be used in the marketplace, and includes materials that have been "source separated".
- L. Solid Waste: All putrescible and nonputrescible solid, semisolid, and liquid wastes, including garbage, trash, refuse, paper, rubbish, ashes, industrial wastes, demolition and construction wastes, abandoned vehicles and parts thereof, discarded home and industrial appliances, dewatered, treated, or chemically fixed sewage sludge which is not hazardous waste, manure, vegetable or animal solid and semisolid wastes, and other discarded solid and semisolid wastes. "Solid waste" does not include hazardous waste, radioactive waste, or medical waste as defined or regulated by State law.
- M. Source-Separated: Materials, including commingled recyclables, that have been separated or kept separate from the solid waste stream at the point of generation, for the purpose of additional sorting or processing of those materials for reuse or recycling in order to return them to the economic mainstream in the form of raw materials for new, reused, or reconstituted products which meet the quality standards necessary to be used in the marketplace.
- N. Waste Hauler: A company that possesses a valid permit from the local waste management authority having jurisdiction to collect and transport solid wastes from individuals or businesses for the purpose of recycling or disposal.

1.5 ADMINISTRATIVE REQUIREMENTS

- A. Submittal Procedures:
 - 1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
 - 2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
 - 3. Sustainable Design Submittals shall comply with the additional requirements of Section 01 8113, Sustainable Design Requirements.

1.6 ACTION SUBMITTALS

- A. Contractor's Construction Waste and Recycling Plan:
 - 1. Review Contract Documents and estimate the types and quantities of materials under the Work that are anticipated to be feasible for on-site processing, source separation for re-use or recycling. Indicate the procedures that will be implemented

CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL
SECTION 01 7419
3595001

- in this program to effect jobsite source separation, such as, identifying a convenient location where dumpsters would be located, putting signage to identify materials to be placed in dumpsters, etc.
2. Prior to commencing the Work, submit Contractor's Construction Waste and Recycling Plan. Submit in format provided with this specification section. The Plan must include, but is not limited to the following:
 - a. Contractor's name and project identification information;
 - b. Procedures to be used;
 - c. Materials to be re-used and recycled;
 - d. Estimated quantities of materials;
 - e. Names and locations of re-use and recycling facilities/sites;
 - f. Tonnage calculations that demonstrate that Contractor will re-use and recycle a minimum of **[65%]** by weight of the construction waste materials generated by the Work.
 3. Contractor's Construction Waste and Recycling Plan must be approved by the Architect prior to the start of Work.
 4. Contractor's Construction Waste and Recycling Plan will not otherwise relieve the Contractor of responsibility for adequate and continuing control of pollutants and other environmental protection measures

1.7 INFORMATIONAL SUBMITTALS

- A. Contractor's Reuse, Recycling, and Disposal Report:
 1. Submit Contractor's Reuse, Recycling, and Disposal Report on the form provided with this specification section with each Application & Certificate for Payment. Failure to submit the form and its supporting documentation will render the Application & Certificate for Payment incomplete and delay progress payments. If applicable, include manifests, weight tickets, receipts, and invoices specifically identifying the Project for re-used and recycled materials:
 - a. Reuse of building materials or salvage items on site (i.e. crushed base or red clay brick).
 - b. Salvaging building materials or salvage items at an offsite salvage or reuse center (i.e. lighting, fixtures).
 - c. Recycling source separated materials on site (i.e. crushing asphalt/concrete for base course, or grinding for mulch).
 - d. Recycling source separated material at an offsite recycling center (i.e. scrap metal or green materials).
 - e. Use of material as Alternative Daily Cover (ADC) at landfills.
 - f. Delivery of soils or mixed inerts to an inert landfill for disposal (inert fill).
 - g. Disposal at a landfill or transfer station (where no recycling takes place).
 - h. Other (describe).
 2. Contractor's Reuse, Recycling, and Disposal Report must quantify all materials generated in the Work, disposed in Class III landfills, or diverted from disposal through recycling. Indicate zero (0) if there is no quantity to report for a type of material. As indicated on the form:

CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL
SECTION 01 7419
3595001

- a. Report disposal or recycling either in tons or in cubic yards. If scales are available at disposal or recycling facility, report in tons; otherwise, report in cubic yards. Report in units for salvage items when no tonnage or cubic yard measurement is feasible.
 - b. Indicate locations to which materials are delivered for reuse, salvage, recycling, accepted as daily cover, inert backfill, or disposal in landfills or transfer stations.
 - c. Provide legible copies of weight tickets, receipts, or invoices that specifically identify the project generating the material. Said documents must be from recyclers and/or disposal site operators that can legally accept the materials for the purpose of re-use, recycling, or disposal.
 - 1) Indicate project title, project number, progress payment number, name of the company completing the Contractor's Report and compiling backup documentation, the printed name, signature, and daytime phone number of the person completing the form, the beginning and ending dates of the period covered on the Contractor's Report, and the date that the Contractor's Report is completed.
3. Demonstrate compliance with California Code of Regulations, Title 24, Part 11 California Green Building Standards Code, "CAL-Green" 5.408.2, to the satisfaction of the enforcing agency.
- a. Landfill **[and Incinerator]** Disposal Records: Indicate receipt and acceptance of waste by landfills **[and incinerator]** facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.
 - b. Recycling and Processing Facility Records: Indicate receipt and acceptance of recyclable waste by recycling and processing facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.
- B. **[For LEED Projects only]** LEED Letter Template: Materials and Resources Credit **[2.1]**
[2.2] Construction Waste Management
1. Complete and sign LEED Letter Template in format provided under the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED) program. Prepare Letter Template on company letterhead.
 - a. Certify that the project has completed a waste management plan and diverted construction, demolition, and land clearing waste to uses other than landfill.
 - b. Provide quantities of diverted materials and means of diversion in the table provided in the LEED Letter Template.
 - c. Indicate how and where waste was diverted.
 - d. Indicate quantities of waste diverted in tons or cubic yards.
 - e. Letter Template will calculate: Total quantity of diverted waste, total quantity of waste, and the percentage of waste diverted.
 - f. For projects where 50% of waste is diverted, one LEED credit will be achieved; where 75% is diverted, two LEED credits will be achieved.
 - g. Include name, organization, role in project, provide signature and date complete

CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL
SECTION 01 7419
3595001

PART 2 - PRODUCTS-NOT USED

PART 3 - EXECUTION

3.1 WASTE MANAGEMENT PLAN

- A. Implement procedures for disposal of materials, as specified in Contractor's Construction Waste and Recycling Plan, which are not diverted for re-use, salvage or recycling.
 - 1. Identify materials to be diverted from disposal by efficient usage, recycling, reuse on the project, or salvage for future use or sale.
 - 2. Determine if materials will be sorted on-site or mixed.
 - 3. Identify diversion facilities where material collected will be taken.
 - 4. Specify that quantities of diverted material will be calculated by weight or volume, but not both.

3.2 SALVAGE, RE-USE, RECYCLING AND PROCEDURES

- A. Re-use, Salvage, and Recycling Facilities: As specified in Contractor's Construction Waste and Recycling Plan.
- B. Develop and implement procedures to re-use, salvage, and recycle new construction and excavation materials, based on the Contract Documents, the Contractor's Construction Waste and Recycling Plan, estimated quantities of available materials, and availability of recycling facilities. Procedures may include on-site recycling, source separated recycling, and/or mixed debris recycling efforts.
 - 1. Identify materials that are feasible for salvage, determine requirements for site storage, and transportation of materials to a salvage facility.
 - 2. Source separate new construction, excavation and demolition materials including, but not limited to the following types.
 - a. Asphalt.
 - b. Concrete, concrete block, slump stone (decorative concrete block), and rocks.
 - c. Drywall.
 - d. Green materials (i.e. tree trimmings and land clearing debris).
 - e. Metal (ferrous and non-ferrous).
 - f. Miscellaneous Construction Debris.
 - g. Paper or cardboard.
 - h. Red Clay Brick.
 - i. Reuse or Salvage Materials
 - j. Soils.
 - k. Wire and Cable.
 - l. Wood.
 - m. Other (describe)

CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL
SECTION 01 7419
3595001

3. Miscellaneous Construction Debris: Develop and implement a program to transport loads of mixed (commingled) new construction materials that cannot be feasibly source separated to a mixed materials recycling facility

3.3 DISPOSAL OPERATIONS AND WASTE HAULING

- A. Legally transport and dispose of materials that cannot be delivered to a source separated or mixed recycling facility to a transfer station or disposal facility that can legally accept the materials for the purpose of disposal.
- B. Use a permitted waste hauler or Contractor's trucking services and personnel. To confirm valid permitted status of waste haulers, contact the local solid waste authority having jurisdiction.
- C. Become familiar with the conditions for acceptance of new construction, excavation and demolition materials at recycling facilities, prior to delivering materials.
- D. Deliver to facilities that can legally accept new construction, excavation and demolition materials for purpose of re-use, recycling, composting, or disposal.
- E. Do not burn, bury or otherwise dispose of solid waste on the project job-site.

3.4 RE-USE AND DONATION OPTIONS

- A. Implement a re-use program to the greatest extent feasible. Options may include:
 1. California Materials Exchange (CAL-MAX) Program is sponsored by the California Integrated Waste Management Board. CAL-MAX is a free service provided by the California Integrated Waste Management Board, designed to help businesses find markets for materials that traditionally would be discarded. The premise of the CAL-MAX Program is that material discarded by one business may be a resource for another business. To obtain a current Materials Listings Catalog, call CAL-MAX/California Integrated Waste Management Board at (916) 255-2369 or send a FAX to (916) 255-2200. The CALMAX Catalog is available through the Internet Site at <http://www.ciwmb/ca.gov/calmax>.

3.5 REVENUE

- A. Revenues or other savings obtained from recycled, re-used, or salvaged materials shall accrue to Contractor unless otherwise noted in the Contract Documents

END OF SECTION

p:\sacramento\3595 tracy unified school district\001-000_villalovoz es new shade structures\08 specifications\06 spec\04 final\freiler - shade struct\01 7419_construction waste management and disposal.docx
Last Updated: December 16, 2021

SECTION 01 7419A
CONTRACTOR'S CONSTRUCTION WASTE AND RECYCLING PLAN
(Submit After Award of Contract and Prior to Start of Work)

Project Title:		
Contract or Work Order No.:		
Contractor's Name:		
Street Address:		
City:	State:	Zip:
Phone: ()	Fax: ()	
E-Mail Address:		
Prepared by: (Print Name)		

Date Submitted:		
Project Period:	From:	TO:

Reuse, Recycling or Disposal Processes To Be Used

Describe the types of recycling processes or disposal activities that will be used for material generated in the project. Indicate the type of process or activity by number, types of materials, and estimated quantities that will be recycled or disposed in the sections below:

- 01 - Reuse of building materials or salvage items on site (i.e. crushed base or red clay brick)
- 02 - Salvaging building materials or salvage items at an off site salvage or re-use center (i.e. lighting, fixtures)
- 03 - Recycling source separated materials on site (i.e. crushing asphalt/concrete for reuse or grinding for mulch)
- 04 - Recycling source separated materials at an off site recycling center (i.e. scrap metal or green matls)
- 05 - Recycling commingled loads of C&D matls at an off site mixed debris recycling center or transfer station
- 06 - Recycling material as Alternative Daily Cover at landfills
- 07 - Delivery of soils or mixed inerts to an inert landfill for disposal (inert fill).
- 08 - Disposal at a landfill or transfer station.
- 09 - Other (please describe) _____

Types of Material To Be Generated

Use these codes to indicate the types of material that will be generated on the project

A = Asphalt	C = Concrete	M = Metals	I = Mixed Inert	G = Green Matls
D = Drywall	P/C=Paper/Cardboard	W/C = Wire/Cable	S= Soils (Non Hazardous)	
M/C = Miscellaneous Construction Debris	R = Reuse/Salvage	W = Wood	O = Other (describe)	

Facilities Used: Provide Name of Facility and Location (City)

Total Truck Loads: Provide Number of Trucks Hauled from Site During Reporting Period

Total Quantities: If scales are available at sites, report in tons. If not, quantify by cubic yards. For salvage/reuse items, quantify by estimated weight (or units).

SECTION I - RE-USED/RECYCLED MATERIALS

Include all recycling activities for source separated or mixed material recycling centers where recycling will occur.

Type of Material	Type of Activity	Facility to be Used/Location	Total Truck Loads	Total Quantities		
(ex.) M	04	ABC Metals, Los Angeles	24	Tons	Cubic YD	Other Wt.
a. Total Diversion			0	0	0	0

SECTION 01 7419A
CONTRACTOR'S CONSTRUCTION WASTE AND RECYCLING PLAN
Continued

SECTION II - DISPOSED MATERIALS						
<i>Include all disposal activities for landfills, transfer stations, or inert landfills where no recycling will occur.</i>						
Type of Material	Type of Activity	Facility to be Used/Location	Total Truck Loads	Total Quantities		
				Tons	Cubic YD	Other Wt.
(ex.) D	08	DEF Landfill, Los Angeles	2	35		
b. Total Disposal				0	0	0

SECTION III - TOTAL MATERIALS GENERATED						
<i>This section calculates the total materials to be generated during the project period (Reuse/Recycle + Disposal = Generation)</i>						
				Tons	Cubic YD	Other Wt.
a. Total Reused/Recycled				0	0	0
b. Total Disposed				0	0	0
c. Total Generated				0	0	0

SECTION IV - CONTRACTOR'S LANDFILL DIVERSION RATE CALCULATION						
<i>Add totals from Section I + Section II</i>						
	Tons	Cubic Yards	Other Wt.			
a. Materials Re-Used and Recycled	0					
b. Materials Disposed	0					
c. Total Materials Generated (a. + b. = c.)	0	0	0			
d. Landfill Diversion Rate (Tons Only)*	#DIV/0!					

* Use tons only to calculate recycling percentages: Tons Reused/Recycled/Tons Generated = % Recycled

Contractor's Comments (Provide any additional information pertinent to planned reuse, recycling, or disposal activities):

Notes:

1. Suggested Conversion Factors: From Cubic Yards to Tons (Use when scales are not available)

Asphalt: .61 (ex. 1000 CY Asphalt = 610 tons. Applies to broken chunks of asphalt)

Concrete: .93 (ex. 1000 CY Concrete = 930 tons. Applies to broken chunks of concrete)

Ferrous Metals: .22 (ex. 1000 CY Ferrous Metal = 220 tons)

Non-Ferrous Metals: .10 (ex. 1000 CY Non-Ferrous Metals = 100 tons)

Drywall Scrap: .20

Wood Scrap: .16

SECTION 01 7419B
CONTRACTOR'S REUSE, RECYCLING, AND DISPOSAL REPORT
(Submit With Each Progress Payment)

Project Title:		
Contract or Work Order No.:		
Contractor's Name:		
Street Address:		
City:	State:	Zip:
Phone: ()	Fax: ()	
E-Mail Address:		
Prepared by: (Print Name)		

Date Submitted:		
Period Covered:	From:	To:

Reuse, Recycling or Disposal Processes Used

Describe the types of recycling processes or disposal activities used for material generated in the project. Indicate the type of process or activity by number, types of materials, and quantities that were recycled or disposed in the sections below:

01 - Reuse of building materials or salvage items on site (i.e. crushed base or red clay brick)
02 - Salvaging building materials or salvage items at an off site salvage or re-use center (i.e. lighting, fixtures)
03 - Recycling source separated materials on site (i.e. crushing asphalt/concrete for reuse or grinding for mulch)
04 - Recycling source separated materials at an off site recycling center (i.e. scrap metal or green matls)
05 - Recycling commingled loads of C&D matls at an off site mixed debris recycling center or transfer station
06 - Recycling material as Alternative Daily Cover at landfills
07 - Delivery of soils or mixed inerts to an inert landfill for disposal (inert fill).
08 - Disposal at a landfill or transfer station.
09 - Other (please describe) _____

Types of Material Generated

Use these codes to indicate the types of material that were generated on the project

A = Asphalt	C = Concrete	M = Metals	I = Mixed Inert	G = Green Matls
D = Drywall	P/C=Paper/Cardboard	W/C = Wire/Cable	S= Soils (Non Hazardous)	
M/C = Miscellaneous Construction Debris	R = Reuse/Salvage	W = Wood	O = Other (describe)	

Facilities Used: Provide Name of Facility and Location (City)

Total Truck Loads: Provide Number of Trucks Hauled from Site During Reporting Period

Total Quantities: If scales are available at sites, report in tons. If not, quantify by cubic yards. For salvage/reuse items, quantify by estimated weight (or units).

SECTION I - RE-USED/RECYCLED MATERIALS

Include all recycling activities for source separated or mixed material recycling centers where recycling occurred.

Type of Material	Type of Activity	Facilities Used/Location	Total Truck Loads	Total Quantities		
(ex.) M	04	ABC Metals, Los Angeles	24	Tons	Cubic YD	Other Wt.
a. Total Diversion			0	0	0	0

SECTION 01 7419B
CONTRACTOR'S REUSE, RECYCLING, AND DISPOSAL REPORT
Continued

SECTION II - DISPOSED MATERIALS						
<i>Include all disposal activities for landfills, transfer stations, or inert landfills where no recycling occurred.</i>						
Type of Material	Type of Activity	Facilities Used/Location	Total Truck Loads	Total Quantities		
				Tons	Cubic YD	Other Wt.
(ex.) D	08	DEF Landfill, Los Angeles	2	35		
b. Total Disposal				0	0	0

SECTION III - TOTAL MATERIALS GENERATED						
<i>This section calculates the total materials generated during the project period (Reuse/Recycle + Disposal = Generation)</i>						
				Tons	Cubic YD	Other Wt.
a. Total Reused/Recycled				0	0	0
b. Total Disposed				0	0	0
c. Total Generated				0	0	0

SECTION IV - CONTRACTOR'S LANDFILL DIVERSION RATE CALCULATION						
<i>Add totals from Section I + Section II</i>						
	Tons	Cubic Yards	Other Wt.			
a. Materials Re-Used and Recycled	0					
b. Materials Disposed	0					
c. Total Materials Generated (a. + b. = c.)	0	0	0			
d. Landfill Diversion Rate (Tons Only)*	#DIV/0!					

* Use tons only to calculate recycling percentages: Tons Reused/Recycled/Tons Generated = % Recycled

Contractor's Comments (<i>Provide any additional information pertinent to planned reuse, recycling, or disposal activities</i>):						

Notes:

- Suggested Conversion Factors: From Cubic Yards to Tons (Use when scales are not available)
Asphalt: .61 (ex. 1000 CY Asphalt = 610 tons. Applies to broken chunks of asphalt)
Concrete: .93 (ex. 1000 CY Concrete = 930 tons. Applies to broken chunks of concrete)
Ferrous Metals: .22 (ex. 1000 CY Ferrous Metal = 220 tons)
Non-Ferrous Metals: .10 (ex. 1000 CY Non-Ferrous Metals = 100 tons)
Drywall Scrap: .20
Wood Scrap: .16

ALTERATION PROJECT PROCEDURES

PART 1 – GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Integration of Work, Purchase of Materials and Equipment, Uncovering of Work and Non-conforming Work and Correction of Work and Trenches;
- B. Special Conditions.

PART 2 - PRODUCTS

2.01 PRODUCTS FOR PATCHING AND EXTENDING WORK:

- A. New Materials: As specified in the Contract Documents including, without limitation, in the Specifications, Contractor shall match existing products, conditions, and work for patching and extending work.
- B. Type and Quality of Existing Products: Contractor shall determine by inspection, by testing products where necessary, by referring to existing conditions and to the Work as a standard.

PART 3 - EXECUTION

3.01 EXAMINATION:

- A. Contractor shall verify that demolition is complete and that areas are ready for installation of new Work.
- B. By beginning restoration Work, Contractor acknowledges and accepts the existing conditions.

3.02 PREPARATION:

- A. Contractor shall cut, move, or remove items as necessary for access to alterations and renovation Work. Contractor shall replace and restore these at completion.
- B. Contractor shall remove unsuitable material not as salvage unless otherwise indicated in the Contract Documents. Unsuitable material may include, without limitation, rotted wood, corroded metals, and deteriorated masonry and concrete. Contractor shall replace materials as specified for finished Work.

- C. Contractor shall remove debris and abandoned items from all areas of the Site and from concealed spaces.
- D. Contractor shall prepare surface and remove surface finishes to provide for proper installation of new Work and finishes.

3.03 INSTALLATION:

- A. Contractor shall coordinate Work of all alternations and renovations to expedite completion and to accommodate District occupancy.
- B. Designated Areas and Finishes: Contractor shall complete all installations in all respects, including operational, and electrical work.
- C. Contractor shall remove, cut, and patch Work in a manner to minimize damage and to provide a means of restoring Products and finishes to original or specified condition.
- D. Contractor shall refinish visible existing surfaces to remain to specified condition for each material, with a neat and square or straight transition to adjacent finishes.
- E. Contractor shall install products as specified in the Contract Documents, including without limitation, the Specifications.

3.04 TRANSITIONS:

- A. Where new Work abuts or aligns with existing, Contractor shall perform a smooth and even transition. Patched Work must match existing adjacent work in texture and appearance.
- B. When finished surfaces are cut so that a smooth transition with new Work is not possible, Contractor shall terminate existing surface along a straight line at a natural line of division and make a recommendation for resolution to the District and the Architect for review and approval.

3.05 ADJUSTMENTS:

- A. Where a change of plane of 1/4 inch or more occurs, Contractor shall submit a recommendation for providing a smooth transition to the District and the Architect for review and approval.
- B. Contractor shall fit Work at penetrations of surfaces.

3.06 REPAIR OF DAMAGED SURFACES:

- A. Contractor shall patch or replace portions of existing surfaces, which are damaged, lifted, discolored, or showing other imperfections, in the area where the Work is performed.
- B. Contractor shall repair substrate prior to patching finish.

3.07 CULTIVATED AREAS AND OTHER SURFACE IMPROVEMENTS:

- A. Cultivated or planted areas and other surface improvements which are damaged by actions of the Contractor shall be restored by Contractor to their original condition or better, where indicated.
- B. Contractor shall protect and replace, if damaged, all existing guard posts, barricades, and fences.
- C. Contractor shall give special attention to avoid damaging or killing trees, bushes and/or shrubs on the Premises and/or identified in the Contract Documents, including without limitation, the Drawings.

3.08 FINISHES:

- A. Contractor shall finish surfaces as specified in the Contract Documents, including without limitations, the provisions of all Divisions of the Specifications.
- B. Contractor shall finish patches to produce uniform finish and texture over entire area. When finish cannot be matched, Contractor shall refinish entire surface to nearest intersections.

3.09 CLEANING:

- A. Contractor shall continually clean the Site and the Premises as indicated in the Contract Documents, including without limitation, the provisions in the General Conditions and the Specifications regarding cleaning.

END OF DOCUMENT

CONTRACT CLOSEOUT AND FINAL CLEANING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Completion of Work;
- B. Special Conditions;
- C. Temporary Facilities and Controls.

1.02 CLOSEOUT PROCEDURES

Contractor shall comply with all closeout provisions as indicated in the General Conditions.

1.03 FINAL CLEANING

- A. Contractor shall execute final cleaning prior to final inspection.
- B. Contractor shall clean interior and exterior glass and all surfaces exposed to view; remove temporary labels, tape, stains, and foreign substances, polish transparent and glossy surfaces, wax and polish new vinyl floor surfaces, vacuum carpeted and soft surfaces.
- C. Contractor shall clean equipment and fixtures to a sanitary condition.
- D. Contractor shall replace filters of operating equipment.
- E. Contractor shall clean debris from roofs, gutters, down spouts, and drainage systems.
- F. Contractor shall clean Site, sweep paved areas, and rake clean landscaped surfaces.
- G. Contractor shall remove waste and surplus materials, rubbish, and construction facilities from the Site and surrounding areas.

1.04 ADJUSTING

Contractor shall adjust operating products and equipment to ensure smooth and unhindered operation.

1.05 RECORD DOCUMENTS AND SHOP DRAWINGS

- A. Contractor shall legibly mark each item to record actual construction, including:
 - (1) Measured depths of foundation in relation to finish floor datum.
 - (2) Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permit surface improvements.
 - (3) Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.
 - (4) Field changes of dimension and detail.
 - (5) Details not on original Contract Drawings
 - (6) Changes made by modification(s).
 - (7) References to related Shop Drawings and modifications.
- B. Contractor will provide one set of Record Drawings to District.
- C. Contractor shall submit all required documents to District and/or Architect prior to or with its final Application for Payment.

1.06 INSTRUCTION OF DISTRICT PERSONNEL

- A. Before final inspection, at agreed upon times, Contractor shall instruct District's designated personnel in operation, adjustment, and maintenance of products, equipment, and systems.
- B. For equipment requiring seasonal operation, Contractor shall perform instructions for other seasons within six months or by the change of season.
- C. Contractor shall use operation and maintenance manuals as basis for instruction. Contractor shall review contents of manual with personnel in detail to explain all aspects of operation and maintenance.
- D. Contractor shall prepare and insert additional data in Operation and Maintenance Manual when the need for such data becomes apparent during instruction.
- E. Contractor shall review contents of manual with personnel in detail to explain all aspects of operation and maintenance.

1.07 SPARE PARTS AND MAINTENANCE MATERIALS

- A. Contractor shall provide products, spare parts, maintenance, and extra materials in quantities specified in the Specifications and in Manufacturer's recommendations.

- B. Contractor shall provide District with all required Operation and Maintenance Data at one time. Partial or piecemeal submissions of Operation and Maintenance Data will not be accepted.

PART 2 – PRODUCTS Not Used.

PART 3 – EXECUTION Not Used.

END OF DOCUMENT

OPERATION AND MAINTENANCE DATA

PART 1 – GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Completion of the Work;
- B. Special Conditions.

1.02 QUALITY ASSURANCE:

Contractor shall prepare instructions and data by personnel experienced in maintenance and operation of described products.

1.03 FORMAT:

- A. Contractor shall prepare data in the form of an instructional manual entitled "OPERATIONS AND MAINTENANCE MANUAL & INSTRUCTIONS" ("Manual").
- B. Binders: Contractor shall use commercial quality, 8-1/2 by 11 inch, three-side rings, with durable plastic covers; two inch maximum ring size. When multiple binders are used, Contractor shall correlate data into related consistent groupings.
- C. Cover: Contractor shall identify each binder with typed or printed title "OPERATION AND MAINTENANCE MANUAL & INSTRUCTIONS"; and shall list title of Project and identify subject matter of contents.
- D. Contractor shall arrange content by systems process flow under section numbers and sequence of Table of Contents of the Contract Documents.
- E. Contractor shall provide tabbed fly leaf for each separate product and system, with typed description of product and major component parts of equipment.
- F. Text: The content shall include Manufacturer's printed data, or typewritten data on 24 pound paper.
- G. Drawings: Contractor shall provide with reinforced punched binder tab and shall bind in with text; folding larger drawings to size of text pages.

1.04 CONTENTS, EACH VOLUME:

- A. Table of Contents: Contractor shall provide title of Project; names, addresses, and telephone numbers of the Architect, any engineers, subconsultants, Subcontractor(s), and Contractor with name of responsible parties; and schedule of products and systems, indexed to content of the volume.

- B. For Each Product or System: Contractor shall list names, addresses, and telephone numbers of Subcontractor(s) and suppliers, including local source of supplies and replacement parts.
- C. Product Data: Contractor shall mark each sheet to clearly identify specific products and component parts, and data applicable to installation. Delete inapplicable information.
- D. Drawings: Contractor shall supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams. Contractor shall not use Project Record Documents as maintenance drawings.
- E. Text: Contractor shall include any and all information as required to supplement product data. Contractor shall provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions.
- F. Warranties and Bonds: Contractor shall bind in one copy of each.

1.05 MANUAL FOR MATERIALS AND FINISHES:

- A. Building Products, Applied Materials, and Finishes: Contractor shall include product data, with catalog number, size, composition, and color and texture designations. Contractor shall provide information for re-ordering custom manufactured products.
- B. Instructions for Care and Maintenance: Contractor shall include Manufacturer's recommendations for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.
- C. Moisture Protection and Weather Exposed Products: Contractor shall include product data listing applicable reference standards, chemical composition, and details of installation. Contractor shall provide recommendations for inspections, maintenance, and repair.
- D. Additional Requirements: Contractor shall include all additional requirements as specified in the Specifications.
- E. Contractor shall provide a listing in Table of Contents for design data, with tabbed fly sheet and space for insertion of data.

1.06 MANUAL FOR EQUIPMENT AND SYSTEMS:

- A. Each Item of Equipment and Each System: Contractor shall include description of unit or system, and component parts and identify function, normal operating characteristics, and limiting conditions. Contractor shall include performance curves, with engineering data and tests, and complete nomenclature, and commercial number of replaceable parts.
- B. Panelboard Circuit Directories: Contractor shall provide electrical service characteristics, controls, and communications.

- C. Contractor shall include color coded wiring diagrams as installed.
- D. Operating Procedures: Contractor shall include start-up, break-in, and routine normal operating instructions and sequences. Contractor shall include regulation, control, stopping, shut-down, and emergency instructions. Contractor shall include summer, winter, and any special operating instructions.
- E. Maintenance Requirements: Contractor shall include routine procedures and guide for trouble-shooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.
- F. Contractor shall provide servicing and lubrication schedule, and list of lubricants required.
- G. Contractor shall include manufacturer's printed operation and maintenance instructions.
- H. Contractor shall include sequence of operation by controls manufacturer.
- I. Contractor shall provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.
- J. Contractor shall provide control diagrams by controls manufacturer as installed.
- K. Contractor shall provide Contractor's coordination drawings, with color coded piping diagrams as installed.
- L. Contractor shall provide charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams.
- M. Contractor shall provide list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.
- N. Additional Requirements: Contractor shall include all additional requirements as specified in Specification(s).
- O. Contractor shall provide a listing in Table of Contents for design data, with tabbed fly sheet and space for insertion of data.

1.07 SUBMITTAL:

- A. Contractor shall submit to the District for review two (2) copies of preliminary draft or proposed formats and outlines of the contents of the Manual within thirty (30) days of Contractor's start of Work.
- B. For equipment, or component parts of equipment put into service during construction and to be operated by District, Contractor shall submit draft content for that portion of the Manual within ten (10) days after acceptance of that equipment or component.

- C. Contractor shall submit two (2) copies of a complete Manual in final form prior to final Application for Payment. Copy will be returned with Architect/Engineer comments. Contractor must revise the content of the Manual as required by District prior to District's approval of Contractor's final Application for Payment.
- D. Contractor must submit two (2) copies of revised Manual in final form within ten (10) days after final inspection.

PART 2 – PRODUCTS Not Used.

PART 3 – EXECUTION Not Used.

END OF DOCUMENT

WARRANTIES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Warranty/Guarantee Information;
- B. Special Conditions.

1.02 FORMAT

- A. Binders: Contractor shall use commercial quality, 8-1/2 by 11 inch, three-side rings, with durable plastic covers; two inch maximum ring size.
- B. Cover: Contractor shall identify each binder with typed or printed title "WARRANTIES" and shall list title of Project.
- C. Table of Contents: Contractor shall provide title of Project; name, address, and telephone number of Contractor and equipment supplier; and name of responsible principal. Contractor shall identify each item with the number and title of the specific Specification, document, provision, or section in which the name of the product or work item is specified.
- D. Contractor shall separate each warranty with index tab sheets keyed to the Table of Contents listing, providing full information and using separate typed sheets as necessary. Contractor shall list each applicable and/or responsible Subcontractor(s), supplier(s), and/or manufacturer(s), with name, address, and telephone number of each responsible principal(s).

1.03 PREPARATION:

- A. Contractor shall obtain warranties, executed in duplicate by each applicable and/or responsible subcontractor(s), supplier(s), and manufacturer(s), within ten (10) days after completion of the applicable item or work. Except for items put into use with District's permission, Contractor shall leave date of beginning of time of warranty blank until the date of completion is determined.
- B. Contractor shall verify that documents are in proper form, contain full information, and are notarized, when required.
- C. Contractor shall co-execute submittals when required.
- D. Contractor shall retain warranties until time specified for submittal.

1.04 TIME OF SUBMITTALS:

- A. For equipment or component parts of equipment put into service during construction with District's permission, Contractor shall submit a draft warranty for that equipment or component within ten (10) days after acceptance of that equipment or component.
- B. Contractor shall submit for District approval all warranties and related documents within ten (10) days after date of completion. Contractor must revise the warranties as required by the District prior to District's approval of Contractor's final Application for Payment.
- C. For items of work delayed beyond date of completion, Contractor shall provide an updated submittal within ten (10) days after acceptance, listing the date of acceptance as start of warranty period.

PART 2 - PRODUCTS Not Used.

PART 3 – EXECUTION Not Used.

END OF DOCUMENT

(Letterhead of Contractor)

STANDARD GUARANTEE / WARRANTY

for

Project Name

Contract No.

We hereby warrant that the Work we have provided under the above reference Contract has been completed in accordance with the Drawings, Specifications, and other Contract Documents.

Under the terms of this warranty, we agree to repair or replace any or all of our work, together with any other adjacent work which may be displaced or damaged by so doing, which may prove to be either patently defective in its workmanship or latently defective in its workmanship or materials within the period of 24 months from the date of filing of the Notice of Completion of the above named Project by the Board of Trustees of the School District, and we also agree to repair any and all damages resulting from such defects, without any expense whatsoever to said Board of Trustees, ordinary wear and tear and unusual abuse or neglect excepted.

In the event of our failure to comply with above-mentioned guarantee conditions within ten (10) day after being notified in writing by the Owner, we collectively and separately do hereby authorize the Owner to have said defective work and damages repaired or replaced and made good at our expense and will honor and pay the costs and charges therefore upon demand.

SIGNED (Contractor) _____

(Address)

(Printed Name of Authorized Representative)

Signature

(License Number)

(Date of Signing)

COUNTERSIGNED (Owner) _____

(Printed Name of Authorized Representative)

Signature

Date of Filing or Notice of Completion: _____

(Letterhead of Company)

SUBCONTRACTOR STANDARD GUARANTEE / WARRANTY

We hereby warrant that

which we have provided in _____
Name of Project

for _____

has been completed in accordance with Specification Section _____ and _____ District _____

has been completed in accordance with Specification Section _____ and requirements of the Contract Documents.

Under the terms of this warranty, we agree to repair or replace any or all of our work, together with any other adjacent work which may be displaced or damaged by so doing, which may prove to be either patently defective in its workmanship or latently defective in its workmanship or materials within a period of 24 months from date of filing the Notice of Completion of the above-named Project by the Board of Trustees of the School District without any expense whatsoever to said Board of Trustees, ordinary wear and tear and unusual abuse or neglect excepted.

In the event of our failure to comply with above-mentioned guarantee conditions within ten (10) day after being notified in writing by the Owner, we collectively and separately do hereby authorize the Owner to have said defective work and damages repaired or replaced and made good at our expense and will honor and pay the costs and charges therefore upon demand.

SIGNED (Subcontractor)	
------------------------	--

(Signature)

(Company Name)

(Address)

(License Number)

(Date of Signing)

COUNTERSIGNED (General Contractor)

(Signature)

(Company Name)

(Address)

(License Number)

(Date of Signing)

(Letterhead of Company)

SPECIAL EXTENDED WRITTEN GUARANTEE / WARRANTY

We hereby warrant that _____

which we have provided in _____
Name of Project

for _____
District

has been completed in accordance with Specification Section _____ and requirements of the Contract Documents.

Under the terms of this warranty, we agree to repair or replace any or all of our work, together with any other adjacent work which may be displaced or damaged by so doing, which may prove to be either patently defective in its workmanship or latently defective in its workmanship or materials within a period of _____ year(s) from date of filing the Notice of Completion of the above-named Project by the Board of Trustees of the School District without any expense whatsoever to said Board of Trustees, ordinary wear and tear and unusual abuse or neglect excepted. We also agree to repair any and all damages resulting from such defects.

In the event of our failure to comply with above-mentioned conditions within a reasonable time but in no case longer than ten (10) calendar days after being notified in writing by the Owner, we collectively and separately do hereby authorize the Owner to have said defective work and damages repaired or replaced and made good at our expense and will honor and pay the costs and charges therefore upon demand.

SIGNED (Subcontractor)

(Name)

(Address)

(License Number) _____
(Date of Signing)

COUNTERSIGNED (General Contractor)

(Name)

(Address)

(License Number) _____
(Date of Signing)

RECORD DOCUMENTS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Documents on Work;
- B. Special Conditions.

PART 2 - RECORD DRAWINGS

2.01 GENERAL:

- A. As indicated in the Contract Documents, the District will provide Contractor with one set of reproducible, full size original Contract Drawings (mylars).
- B. Contractor shall maintain at each Project Site one set of marked-up plans and shall transfer all changes and information to those marked-up plans, as often as required in the Contract Documents, but in no case less than once each month. Contractor shall submit to the Project Inspector one set of reproducible vellums of the Project Record Drawings ("As-Built") showing all changes incorporated into the Work since the preceding monthly submittal. The As-Built shall be available at the Project Site. The Contractor shall submit reproducible vellums at the conclusion of the Project following review of the blue line prints.
- C. Label and date each Record Drawing "RECORD DOCUMENT" in legibly printed letters.
- D. All deviations in construction, including but not limited to pipe and conduit locations and deviations caused by without limitation Change Orders, Construction Claim Directives, RFI's, and Addenda, shall be accurately and legibly recorded by Contractor.
- E. Locations and changes shall be done by Contractor in a neat and legible manner and, where applicable, indicated by drawing a "cloud" around the changed or additional information.

2.02 RECORD DRAWING INFORMATION:

- A. Contractor shall record the following information:
 - (1) Locations of Work buried under or outside each building, including, without limitation, all utilities, plumbing and electrical lines, and conduits.

- (2) Actual numbering of each electrical circuit to match panel schedule.
- (3) Locations of significant Work concealed inside each building whose general locations are changed from those shown on the Contract Drawings.
- (4) Locations of all items, not necessarily concealed, which vary from the Contract Documents.
- (5) Installed location of all cathodic protection anodes.
- (6) Deviations from the sizes, locations, and other features of installations shown in the Contract Documents.
- (7) Locations of underground work, points of connection with existing utilities, changes in direction, valves, manholes, catch basins, capped stubouts, invert elevations, etc.
- (8) Sufficient information to locate Work concealed in each building with reasonable ease and accuracy.

In some instances, this information may be recorded by dimension. In other instances, it may be recorded in relation to the spaces in the building near which it was installed.

- B. Contractor shall provide additional drawings as necessary for clarification.
- C. Contractor shall provide reproducible record drawings, made from final Shop Drawings marked "No Exceptions Taken" or "Approved as Noted."
- D. After review and approval of the marked-up specifications by the Project Inspector, Contractor shall provide electronic copies of the drawings (in PDF format) with one file with all of the sheets and one set of individual sheet files at the conclusion of the Project.

PART 3 - RECORD SPECIFICATIONS

3.01 GENERAL:

- A. Contractor shall mark each section legibly to record manufacturer, trade name, catalog number, and supplier of each Product and item of equipment actually installed.
- B. After review and approval of the marked-up specifications by the Project Inspector, Contractor shall provide one electronic copy of the specifications (in PDF format) at the conclusion of the Project.

PART 4 - MAINTENANCE OF RECORD DOCUMENTS

4.01 GENERAL

- A. Contractor shall store Record Documents apart from documents used for construction as follows:

- (1) Provide files and racks for storage of Record Documents.
- (2) Maintain Record Documents in a clean, dry, legible condition and in good order.

B. Contractor shall not use Record Documents for construction purposes.

PART 5 – PRODUCTS Not Used.

END OF DOCUMENT

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes general requirements and procedures for compliance with California Code of Regulations, Title 24, Part 11 California Green Building Standards Code, "CAL-Green".

- 1. Chapter 5- Non-Residential Mandatory Measures.

1.2 RELATED REQUIREMENTS

- A. Pertinent sections specifying erosion control.
- B. Section 01 6116, Volatile Organic Compound (VOC) Restrictions.
- C. Section 01 7419, Construction Waste Management and Disposal.
- D. Section 01 7700, Closeout Procedures.

1.3 DEFINITIONS

- A. CAL-Green Definitions: Certain terms are defined by CAL-Green in Chapter 5 of the code. Words and terms used in this section shall have the meanings shown therein.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Respond to questions and requests from Architect and the jurisdiction having authority regarding CAL-Green credits that are the responsibility of the Contractor, that depend on product selection or product qualities, or that depend on Contractor's procedures. Document responses as informational submittals.

1.5 SUBMITTALS

- A. CAL-GREEN Submittals: Submit CAL-GREEN submittals required by code and in other Specification Sections.
 - 1. CAL-GREEN submittals are in addition to other submittals. If submitted item is identical to that submitted to comply with other requirements, submit duplicate copies as a separate submittal to verify compliance with indicated CAL-GREEN requirements.
 - 2. Acceptable verification submittals are specified in the related sections.

SUSTAINABLE DESIGN REQUIREMENTS
SECTION 01 8113.10
3595001

PART 2 - PRODUCTS

2.1 REQUIREMENTS - GENERAL

- A. Provide products and procedures necessary to confirm CAL-GREEN compliance required in this Section. Although other Sections may specify some CAL-GREEN requirements, the Contractor shall determine additional materials, techniques, means, methods and procedures necessary to comply with CAL-GREEN requirements.

2.2 STORM WATER POLLUTION PREVENTION PLAN

- A. Section 5.106.1: Comply with requirements of this code section, local ordinances, General Conditions, Special Provisions, and related sections specifying erosion control.

2.3 OUTDOOR WATER USE

- A. Section 5.304.3.1: Irrigation Controllers: Comply with requirements of this code section, local ordinances and Section 32 8000.

2.4 CONSTRUCTION WASTE REDUCTION

- A. Section 5.408 Construction Waste Management, Diversion and Recycling: Comply with requirements of this code section, local ordinances and Section 01 7419.

2.5 BUILDING MAINTENANCE AND OPERATION

- A. Section 5.410.2.5. Documentation and Training: Provide Operations Training as required by these code sections and as specified in Section 01 7700 and Systems Manual as specified in Section 01 7700.

2.6 POLLUTANT CONTROL

- A. Section 5.504.3 Indoor Air Quality: Comply with requirements of this code section, local ordinances and Section 01 3543.
 - 1. During storage, rough installation and until final start-up of HVAC equipment, securely cover all ducts and air distribution component openings with plastic, tape, sheet metal or other methods acceptable to enforcing agency to reduce dust or debris collected in the system.
- B. Section 5.504.4 Finish Material Pollutant Control: All Finish materials shall comply with requirements of this code section, local ordinances and Section 01 6116.

PART 3 - EXECUTION

3.1 GENERAL

- A. Comply with Section 01 7419, Construction Waste Management and Disposal.

SUSTAINABLE DESIGN REQUIREMENTS
SECTION 01 8113.10
3595001

- B. Comply with execution requirements of related sections and applicable local codes and ordinances.

END OF SECTION

*p:\sacramento\3595 tracy unified school district\001-000_villalovoz es new shade structures\08 specifications\06 spec\04 final\freiler
- shade struct\01 8113.10_sustainable design requirements (cal-green).docx
Last Updated: April 8, 2019*

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Engineered fill materials.
 - 2. Imported engineered fill material.
 - 3. Landscape backfill material'
 - 4. Decomposed granite.
 - 5. Aggregate base.

1.2 RELATED REQUIREMENTS

- A. Section 01 5000, Temporary Facilities and Controls.
- B. Section 01 8113, Sustainable Design Requirements, for CAL-Green **[and Collaborative for High Performance Schools (CHPS)]** general requirements and procedures.
- C. Section 31 2333, Trenching and Backfilling.
- D. Section 32 1200, Asphalt Concrete Paving.
- E. Section 32 1600, Site Concrete.
- F. Section 33 0000, Utilities
- G. Section 33 4000, Storm Drainage Utilities.

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CAL Green), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- C. Local Jurisdiction: Any work within the street, highway or right-of-way shall be performed in accordance with the requirement of the governmental agencies having jurisdiction, and shall not begin until all of those governing authorities have been notified.
- D. ASTM International (ASTM):
 - 1. D698-00 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures, Using 5.5 lb (2.49 Kg) Rammer and 12 inch (304.8 mm) Drop.
 - 2. D1556-00 - Test Method for Density of Soil in Place by the Sand-Cone Method.
 - 3. D1557-02e2 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 10 lb. (4.54 Kg) Rammer and 18 inch (457 mm) Drop.

EARTHWORK
SECTION 31 0000
3595001

4. D3017-05 Test Methods for Moisture Content of Soils and Soil-Aggregate Mixture by Nuclear Methods (Shallow Depth).
5. D422-63(2007) e1 Test Method for Particle Size Analysis of Soil.
6. D4318-05 Test Method for Liquid Limit, Plastic Limit, and Plasticity Limit.

E. CALTRANS Standard Specifications Section 17.

F. CAL-OSHA, Title 8, Section 1590 (e).

1.4 ADMINISTRATION REQUIREMENTS

A. Submittal Procedures:

1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
3. Sustainable Design Submittals shall comply with the additional requirements of Section 01 8113, Sustainable Design Requirements.

B. Site Visitation: All bidders interfacing with existing conditions shall visit the site prior to bid to verify general conditions of improvements. Discrepancies must be reported prior to the bid for clarification.

1.5 ACTION SUBMITTALS

A. Provide supplier's descriptive literature for all products to demonstrate compliance with specified attributes.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Contractor / Installer.

1.7 CLOSEOUT SUBMITTALS

A. Guarantee: Submit subcontractor's guarantee.

1.8 QUALITY ASSURANCE

- A. Contractor / Installer shall have been in business for five (5) years providing/finishing similar size projects and complexity.
- B. Contractor shall be solely responsible for all subgrades built. Failures resulting from inadequate compaction or moisture content are the responsibility of the contractor. Contractor shall be solely responsible for any and all repairs.
- C. The representatives of the Owner's testing lab will not act as supervisor of construction, nor will they direct construction operations. Neither the presence of the Owner's testing lab representatives nor the testing by the Owner's testing lab shall excuse the contractors or subcontractors for defects discovered in their work during or following completion of

the project. Correcting of inadequate compaction or moisture content is the sole responsibility of the contractor.

- D. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.
- E. All materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.
- F. Tests (See Part 3, Article "Testing and Observation" for Compaction Testing).

1.9 DELIVERY, STORAGE AND HANDLING

- A. Transport, store and handle in strict accord with the local jurisdiction.

1.10 FIELD CONDITIONS

1.11 EXISTING SITE CONDITIONS

- A. Contractor shall acquaint himself with all site conditions. If unknown active utilities are encountered during work, notify Architect promptly for instructions. Failure to notify will make Contractor liable for damage to these utilities arising from Contractor's operations subsequent to discovery of such unknown active utilities.
- B. Existing civil, mechanical and electrical improvements are shown on respective site plans to the extent known. Should the Contractor encounter any deviation between actual conditions and those shown, he is to immediately notify the Architect before continuing work.

1.12 ON SITE UTILITY VERIFICATION AND REPAIR PROCEDURES

- A. Ground-breaking requirements:
 - 1. All underground work performed by a Contractor must be authorized by the District's Construction Manager or the Low Voltage Consultant prior to start of construction.
 - 2. The Contractor is to obtain and keep the original School's construction utility site plans on site during all excavation operations. Contractor can contact the District's Construction Manager, Facilities Manager, or the Low Voltage Consultant to procure the drawings.
- B. Underground Utility Locating:
 - 1. The contractor shall hire an Underground Utility Locating Service to locate existing underground utility pathways in areas effected by the scope of work for excavation.
 - 2. Contractor must use an underground utility locator service with a minimum of 3 years experience. The equipment operator must have demonstrated experience. Contact Norcal Underground Locating (800/986-6722) or Precision Locating (800/577-7324)

EARTHWORK
SECTION 31 0000
3595001

3. The Underground Utility Locator Service must have the use of equipment with the ability to locate by means of inductive clamping, induction, inductive metal detection, conductive coupling, or TransOnde (Radiodetection) to generate signals, passive locating (free scoping) for "hot" electric, and metal detector.
4. The Underground Utility Locator Service must be able to locate existing utilities at a depth of at least 72".
5. The Underground Utility Locator Service must be able to locate but are not limited to locating the following types of utility pathways:
 - a. All conduit pathways containing 110 volt or greater 50-60Hz electrical wire.
 - b. All conduit pathways containing an active cable TV system.
 - c. All conduit pathways containing wire or conductor in which a signal can be attached and generated without damaging or triggering the existing systems.
 - d. All empty conduit pathways or pipe in which a signal probe or sonde (miniature transmitter) can be inserted.
 - e. All conduit pathways containing non-conductive cables or wires in which a signal probe or sonde (miniature transmitter) can be inserted.
 - f. All plastic and other nonconductive water lines in which a TransOnde Radiodetection) or other "transmitter" can be applied to create a low frequency pressure wave (signal) without damaging or triggering the existing systems.
 - g. All copper or steel waterlines and plastic or steel gas lines.
6. All markings made by the Underground Utility Locator Service or other shall be clear and visible.
7. The contractor shall maintain all markings made by Underground Utility Locator Service or other throughout the entire length of the project.
8. The Underground Utility Locator Service shall provide the contractor with two sets of maps showing the location of utilities and average depth. They will be referenced to permanent buildings. Contractor will deliver one copy to the district at no additional charge.
9. Contractor is responsible to contact Underground Service Alert (U.S.A. 800/227-2600) and receive clearance prior to any excavation operations.
10. Contractor shall inform the (District's Construction Manager)(Architect)(Owner) no later than five (5) days prior to the date scheduled for the utility locator service to be on site.

1.13 PROTECTION

- A. Adequate protection measures shall be provided to protect workmen and passers-by on and off the site. Adjacent property shall be fully protected throughout the operations. Blasting will not be permitted. Prevent damage to adjoining improvements and properties both above and below grade. Restore such improvements to original condition should damage occur. Replace trees and shrubs outside building area disturbed by operations.
- B. In accordance with generally accepted construction practices, the Contractor shall be solely and completely responsible for working conditions at the job site, including safety

of all persons and property during performance of the work. This requirement shall apply continuously and shall not be limited to normal working hours.

- C. Any construction review of the Contractor's performance conducted by the Geotechnical Engineer is not intended to include review of the adequacy of the Contractor's safety measures, in, on, or near the construction site.
- D. Provide shoring, sheeting, sheet piles and or bracing to prevent caving, erosion or gullyng of sides of excavation.
- E. Surface Drainage: Provide for surface drainage during period of construction in manner to avoid creating nuisance to adjacent areas. The contractor shall make a reasonable effort on a daily basis to keep all excavations and the site free from water during entire progress of work, regardless of cause, source, or nature of water.
- F. Adjacent streets and sidewalks shall be kept free of mud, dirt or similar nuisances resulting from earthwork operations.
- G. The site and adjacent influenced areas shall be watered as required to suppress dust nuisance. Dust control measures shall be in accordance with the local jurisdiction.
- H. Trees: Carefully protect existing trees that are to remain. Provide temporary irrigation as necessary to maintain health of trees.

1.14 SEASONAL LIMITS

- A. No fill material shall be placed, spread or rolled during unfavorable weather conditions. When work is interrupted by rains, fill operations shall not be resumed until field tests indicate that moisture content and density of fill are satisfactory.
- B. Excessively wet fill material shall be bladed and aerated per Article "Subgrade Preparation".

1.15 TESTING

- A. General: Refer to Section 01 4523 - TESTING AND INSPECTION SERVICES, AND STRUCTURAL TESTS AND INSPECTIONS LIST, DSA-103.
- B. Geotechnical Engineer: Owner is retaining a Geotechnical Engineer to determine compliance of fill with Specifications, and to direct adjustments in fill operations. Costs of Geotechnical Engineer will be borne by Owner; except those costs incurred for re-tests or re-inspection will be paid by Owner and backcharged to Contractor.
 - 1. If Contractor elects to process or mine onsite materials for use as Suitable Fill, Aggregate Sub Base, Aggregate Base, Rock, Crushed Rock or sand the cost of all testing of this material shall be paid for by the Contractor.
 - 2. Testing of import fill for compliance with Department of Toxic Substance Control (DTSC) shall be paid for by the Contractor.

**EARTHWORK
SECTION 31 0000
3595001**

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Engineered Fill Materials: All fill shall be of approved local materials supplemented by imported fill if necessary. "Approved" local materials are defined as local soils tested and approved by Geotechnical Engineer free from debris, and concentrations of clay and organics; and contain rocks no larger than 3-inches in greatest dimension. The soil and rock should be thoroughly blended so that all rock is surrounded by soil. This may require mixing of the soil and rock with a dozer prior to placement and compaction. Clods, rocks, hard lumps or cobbles exceeding 3-inches in final size shall not be allowed in the upper 6 inches of any fill. Native clay or clayey soils will not be permitted within the upper 12 inches of building pad areas or paved areas.
- B. Imported Engineered Fill Material: Imported fill may be required to complete work. Proposed import fill material shall meet the above requirements; shall be similar to the native soils. Import fill shall meet the above requirements; shall have plasticity index of 20 or less; an Expansion Index of 15 or less; be free of particles greater than 3-inch (3") in largest dimension; be free of contaminants and have corrosion characteristics within the acceptable limits. All import fill material shall be tested and approved by Soils Engineer prior to transportation to the site. Proposed fill material shall comply with DTSC guidelines to include Phase 1 environmental site assessment and related tests. Refer to the October 2001 DTSC Information Advisory for clean imported fill material.
1. DTSC TESTING: Site work contractor is to coordinate testing with an analytical lab, hired by the owner, licensed by the State of California for the DTSC testing. The costs associated with testing will be paid by the contractor.
 2. DTSC testing shall include documentation as to the previous land use, location, and history. Soils shall be analyzed for all compounds of concern to ensure the imported soil is uncontaminated and acceptable. Testing shall be performed per the recommendations included in DTSC Imported Fill Advisory (http://www.dtsc.ca.gov/Schools/upload/SMP_FS_Cleanfill-Schools.pdf). Soils shall be tested prior to import to the project site.
 3. Lab shall determine geographically which tests and analysis comparison will be appropriate for the testing. (CAM 17 / Title 22); (RWQCB) Regional Water Quality Control Board; or (OEHHA) Office of Environmental Health Hazard Assessment.
 4. Frequency of testing shall be conducted in accordance with DTSC's Imported Fill Advisory as follows;

Fill Material Sample Schedule	
Area Of Individual Borrow Area	Sampling Requirements
2 Acres or less	Minimum of 4 samples
2 to 4 Acres	Minimum of 1 sample every ½ acre
4 to 10 Acres	Minimum of 8 samples

**EARTHWORK
SECTION 31 0000
3595001**

Greater than 10 Acres	Minimum of 8 locations with 4 subsamples per location
-----------------------	---

Volume of Borrow Area Stockpile	
Up to 1,000 Cubic Yards	1 sample per 250 cubic yards
1,000 to 5,000 Cubic Yards	4 samples for the first 1000 cubic yards + 1 sample per each additional 500 cubic yards
Greater than 5,000 Cubic Yards	12 samples for the first 5,000 cubic yards + 1 sample per each additional 1,000 cubic yards

5. Reports/ Documentation
 - a. Results of the testing analysis shall be sent to the Owner; Architect; Project Inspector, Project Civil Engineer, DTSC, and DSA. Letter shall reference DSA file and application numbers.
- C. Landscape Backfill Material:
 1. The top 3" of native topsoil stripped from the site may be used for landscape backfill material.
- D. Water: Furnish all required water for construction purposes, including compaction and dust control. Water shall be potable.
- E. Aggregate Base: Provide Class 2 3/4" Aggregate Base conforming to standard gradation as specified in Cal Trans Standard Specifications, Section 26,-1.02A.
- F. Decomposed Granite: Decomposed Granite shall be well graded mixture of fine to 1/8" particles in size with no clods. The material shall be free of vegetation, other soils, debris and rock. The material shall be redish-tan to tan in color.
- G. Decomposed Granite Solidifier: PolyPavement or equal.

PART 3 - EXECUTION

3.1 INSPECTION LAYOUT AND PREPARATION

- A. Prior to installation of the work of this Section, carefully inspect and verify by field measurements that installed work of all other trades is complete to the point were this installation may properly commence
- B. Layout all work, establish grades, locate existing underground utilities, set markers and stakes, setup and maintain barricades and protection facilities; all prior to beginning

**EARTHWORK
SECTION 31 0000
3595001**

actual earthwork operations. Layout and staking shall be done by a licensed Land Surveyor or Professional Civil Engineer.

- C. Verify that specified items may be installed in accordance with the approved design.
- D. In event of discrepancy, immediately notify Owner and the Architect. Do not proceed in discrepant areas until discrepancies have been fully resolved.

3.2 PERFORMANCE

A. GENERAL:

- 1. General: Do all grading, excavating and cutting necessary to conform finish grade and contours as shown. All cuts shall be made to true surface of subgrade.
- 2. Archaeological Artifacts: Should any artifacts of possible historic interest be encountered during earthwork operations, halt all work in area of discovery and immediately contact the Architect for notification of appropriate authorities.
- 3. Degree of Compaction: Percentage of maximum density, hereinafter specified as degree of compaction required, means density equivalent to that percentage of maximum dry density determined by ASTM D1557 Compaction Test method, and such expressed percentage thereof will be minimum acceptable compaction for specified work.
- 4. Moisture Content: Moisture content shall be as noted below and as called for on the plans. Moisture content shall be maintained until subgrade is covered by surfacing materials.

3.3 DEMOLITION, DISPOSAL AND DISPOSITION OF UNDESIRABLE MAN-MADE FEATURES

- A. All other obstructions, such as abandoned utility lines, septic tanks, concrete foundations, and the like shall be removed from site. Excavations resulting from these removal activities shall be cleaned of all loose materials, dish shaped, and widened as necessary to permit access for compaction equipment. Areas exposed by any required over-excavation should be scarified to a depth of 12", moisture-conditioned to near optimum moisture content, and recompacted to at least 95% of the maximum dry density.

3.4 TESTING AND OBSERVATION

- A. All grading and earthwork operations shall be observed by the Geotechnical Engineer or his representative, serving as the representative of the Owner.
- B. Field compaction tests shall be made by the Geotechnical Engineer or his representative. If moisture content and/or compaction are not satisfactory, Contractor will be required to change equipment or procedure or both, as required to obtain specified moisture or compaction. Notify Geotechnical Engineer at least 48 hours in advance of any filling operation.
- C. Earthwork shall not be performed without the notification or approval of the Geotechnical Engineer or his representative. The Contractor shall notify the Geotechnical Engineer at least two (2) working days prior to commencement of any aspect of the site earthwork.

- D. If the Contractor should fail to meet the compaction or design requirements embodied in this document and on the applicable plans, he shall make the necessary readjustments until all work is deemed satisfactory, as determined by the Geotechnical Engineer or Architect/Engineer.
- E. After each rain event Geotechnical Engineer shall test fill material for optimum moisture. Do not place any fill material until desired moisture is achieved.

3.5 CLEARING AND GRUBBING

- A. Prior to grading, remove all debris off-site. Remove trees and brush including the root systems. Holes resulting from tree and brush removal should be prepared and backfilled in accordance with paragraphs 3.7, 3.8, 3.9, and 3.10. This may require deepening and/or widening the holes to adequately remove disturbed soil and provide room for compaction equipment. Strip the surface of all organics. Strippings meeting the requirements of Section 32 9000 may be used in landscape areas only.

3.6 CUTTING

- A. Building pads that are located within a cut/fill transition area will have to be overexcavated to provide a semi-uniform fill beneath the building pad. The portions of building pads located in cut areas shall be overexcavated to provide no more than 1 foot difference in fill placed in the same building pad.
- B. Do all cutting necessary to bring finish grade to elevations shown on Drawings.
- C. When excavation through roots is necessary, cut roots by hand.
- D. Carefully excavate around existing utilities to avoid unnecessary damage. The contractor shall anticipate and perform hand work near existing utilities as shown on the survey, without additional claims or cost.

3.7 STRUCTURAL EXCAVATION

- A. General: Excavate to bear on firm material at contract depth shown on Structural Drawings.
- B. Footings: All footing excavations shall be of sufficient width for installation of formwork, unless earth will retain its position during concreting. All portions of footings above grade must be formed. In the event that footings are placed against earth, footing widths below grade shall be increased 2 inches from those shown on Drawings and positive protection shall be provided for top corners of trench.
- C. Unsuitable Ground: Any errors in structural excavation, soft ground, or clay soils found when excavating shall be reported to Architect. In no case shall work be built on any such soft or clayey unsuitable surface without direction from the Architect. Restore excavations to proper elevation with engineered fill material compacted to 95% of dry density.

**EARTHWORK
SECTION 31 0000
3595001**

3.8 SUBGRADE PREPARATION

- A. Grade compact and finish all subgrades within a tolerance of 0.10' of grades as indicated on Drawings and so as not to pool water. Subgrade within building pads and concrete walks shall be within 0.05' of grades indicated.
- B. After clearing, grubbing and cutting, subsurface shall be plowed or scarified to a depth of at least 12", until surface is free from ruts, hummocks or other uneven features. Moisture condition to 2% above optimum moisture content and recompact to at least 95% of the maximum dry density as determined by ASTM Test Method D1557. If the existing soils are at a water content higher than specified, the contractor shall provide multiple daily aerations by ripping, blading, and/or discing to dry the soils to a moisture content where the specified degree of compaction can be achieved. After seven consecutive working days of daily aerations, and the moisture content of the soil remains higher than specified, the contractor shall notify the architect. If the existing soils have a moisture content lower than specified, the contractor shall scarify, rip, water and blade existing soil to achieve specified moisture content. The contractor shall make proper allowance in schedule and methods to complete this work.
- C. After subgrade for fill within building pad area or within paved areas has been cleared, plowed and scarified, it shall be disked or bladed until uniform and free from large clods, brought to 2% above optimum moisture content and compacted to not less than 95% of maximum dry density, as determined by ASTM Test Method D1557, and such expressed percentage thereof will be minimum acceptable density for specified work.
- D. Subgrade in areas to receive landscaping shall be compacted to (85%).
- E. Where Contractor over-excavates building pads through error, resulting excavation shall be recompacted as engineered fill at Contractor's expense.

3.9 PLACING, SPREADING AND COMPACTING FILL MATERIAL IN BUILDING PAD AND PAVEMENT AREAS

- A. Selected fill material shall be placed in layers which, when compacted, shall not exceed 6 inches in compacted thickness. Each layer shall be spread evenly and thoroughly mixed to insure uniformity in moisture content.
- B. Selected fill material shall be moisture-conditioned to specified moisture content. Selected fill material shall be unfrozen. When moisture content of fill material is below that specified, add water until proper moisture content is achieved. When moisture content is above that specified, aerate by blading or other methods mentioned in 3.08 B until moisture content is satisfactory.
- C. After each layer has been placed, mixed and spread evenly, it shall be thoroughly compacted to a minimum of 90% as determined by the ASTM D1557 Compaction Test. Compact each layer over its entire area until desired density has been obtained.
- D. Recomposition of Fill in Trenches and Compaction of Fill Adjacent to Walls: Where trenches must be excavated, backfill with material excavated. Place in lifts that when compacted do not exceed 6", moisture conditioned to (optimum)(2% above optimum)

moisture content, and compact to a minimum of 90% relative compaction in building pad and paved areas, and to 90% relative compaction in landscape areas.

- E. Jetting of fill materials will not be allowed.

3.10 FINAL SUBGRADE COMPACTION

- A. Building Pads: Upper 12" of all final building pad subgrades (including future buildings) shall be uniformly compacted at specified moisture content to at least 90% of maximum dry density, as determined by ASTM D1557 Compaction Test, regardless of whether final subgrade elevation is attained by filling, excavation, or is left at existing grade. After acceptance of final compaction test, contractor shall maintain the required moisture content of subgrade until concrete flatwork is placed.
- B. Paved Areas: Upper 12" of all final subgrades supporting pavement sections and all other flatwork shall be brought to specified moisture content and shall be uniformly compacted to not less than 95% of maximum dry density, regardless of whether final subgrade elevation is attained by filling, excavation, or is left at existing grade. After acceptance of final compaction test, contractor shall maintain the required moisture content of subgrade until concrete flatwork is placed.
- C. Other Fill and Backfill: Upper 12" of all other final subgrades or finish grades shall be compacted to 90% of maximum dry density.
- D. Gravel Fill: Do not place compacted gravel fill until after underground work and foundations are in place. Compact gravel fill with vibratory plate or similar equipment to preclude settlement.

3.11 PLACING, SPREADING, AND COMPACTION OF LANDSCAPE BACKFILL MATERIALS

- A. All landscaped areas shall receive topsoil. After subgrade under landscape area has been scarified and brought to 85% maximum dry density, top soil shall be placed evenly to depth of 12" at 85% of maximum dry density.
- B. Project Inspector must verify that materials are uniformly spread to minimum depth specified.

3.12 SLOPE CONSTRUCTION

- A. Cut slopes shall be constructed to no steeper than 2:1(horizontal:vertical). Fill slopes shall be constructed to no steeper than 2:1 (horizontal:vertical). Prior to placement of fill on an existing slope the existing slope shall be benched. The benches shall be in a ratio of 2 horizontal to 1 vertical. The face of the fill slopes shall be compacted as the fill is placed, or the slope may be overbuilt and then cut back to the design grade. Compaction by track walking will not be allowed.

3.13 FINISH GRADING

- A. At completion of project, site shall be finished graded, as indicated on Drawings. Finish grades shall be "flat graded" to grades shown on the drawing. Mounding of finish grades

EARTHWORK
SECTION 31 0000
3595001

will not be allowed unless otherwise directed on the landscape drawings. Tolerances for finish grades in drainage swales shall be $\pm 0.05'$. Tie in new and existing finish grades. Leave all landscaped areas in finish condition for lawn seeding. Landscaped planters shall be graded uniformly from edge of planter to inlets. If sod is used for turf areas the finish grade on which it is placed shall be lowered to allow for sod thickness.

- B. All landscape areas shall be left free of rock or foreign material.
- C. All landscape areas shall be approved by Architect prior to any planting.

3.14 SURPLUS MATERIAL

- A. Excavated material not required for grading or backfill shall be removed from site at contractor's expense.

3.15 CLEANING

- A. Refer to Section 01 7700.
- B. Remove from fill all vegetation, wood, form lumber, casual lumber, and shavings, in contact with ground; buried wood will not be permitted in any fill.

END OF SECTION

s:\master specifications\division 31 - earthwork\31 0000_earthwork.docx
Received from WCEI: June 7, 2018, Updated format: 9-3-21

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Trench backfill materials.

1.2 RELATED REQUIREMENTS

- A. Section 01 5000, Temporary Facilities and Controls.
- B. Section 01 8113, Sustainable Design Requirements, for CAL-Green **[and Collaborative for High Performance Schools (CHPS)]** general requirements and procedures.
- C. Section 31 0000, Earthwork.
- D. Section 32 8000, Irrigation.
- E. Section 33 0000, Utilities
- F. Section 33 4000, Storm Drainage Utilities.

1.3 REREENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CAL Green), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- C. California Plumbing Code (CPC), edition as noted on the drawings.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Submittal Procedures:
 - 1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
 - 2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
 - 3. Sustainable Design Submittals shall comply with the additional requirements of Section 01 8113, Sustainable Design Requirements.
- B. Coordination:
 - 1. General Contractor shall coordinate work as herein specified, in accordance with drawings and as required to complete scope of work with all related trades.

TRENCHING AND BACKFILLING
SECTION 31 2333
3595001

1.5 ACTION SUBMITTALS

- A. Provide supplier's descriptive literature for all products to demonstrate compliance with specified attributes:

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For contractor / Installer.

1.7 CLOSEOUT SUBMITTALS

- A. Guarantee: Submit subcontractor's guarantee.

1.8 QUALITY ASSURANCE

- A. Contractor / Installer shall have been in business for five (5) years providing/finishing similar size projects and complexity.
- B. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.
- C. All materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.

1.9 DELIVERY, STORAGE AND HANDLING

- A. Transport, store and handle in strict accord with the local jurisdiction.

1.10 FIELD CONDITIONS

- A. Contractor shall acquaint himself with all existing site conditions. If unknown active utilities are encountered during work, notify Architect promptly for instructions. Failure to notify will make Contractor liable for damage to these utilities arising from Contractor's operations subsequent to discovery of such unknown active utilities.
- B. Trench dewatering may be necessary. Contractor shall provide any and all tools, equipment and labor necessary for trench dewatering no matter what the source. Dewatering shall be continuous until all site utilities are installed and backfilled.

1.11 PROTECTION

- A. Adequate protection measures shall be provided to protect workers and passers-by on and off the site. Adjacent property shall be fully protected throughout the operations. Blasting will not be permitted. Prevent damage to adjoining improvements and properties both above and below grade. Restore such improvements to original condition should damage occur. Replace trees and shrubs outside building area disturbed by operations. Repair all trenches in grass areas with new sod (seeding not permitted) and "stake-off" for protection.

TRENCHING AND BACKFILLING
SECTION 31 2333
3595001

- B. Contractor shall be solely and completely responsible for working conditions at the job site, including safety of all persons and property during performance of the work. This requirement shall apply continuously and shall not be limited to normal working hours.
- C. Any construction review of the Contractor's performance conducted by the Architect or Owner is not intended to include review of the adequacy of the Contractor's safety measures, in, on or near the construction site.
- D. Provide shoring, sheeting, sheet piles and or bracing to prevent caving, erosion or gulying of sides of excavation.
- E. Surface Drainage: Provide for surface drainage during period of construction in manner to avoid creating nuisance to adjacent areas. Keep all excavations free from water during entire progress of work, regardless of cause, source or nature of water.
- F. Adjacent streets and sidewalks shall be kept free of mud, dirt or similar nuisances resulting from earthwork operations.
- G. The site and adjacent influenced areas shall be watered as required to suppress dust nuisance.
- H. Trees: Carefully protect existing trees which are to remain.

1.12 TRENCH SAFETY PROVISIONS

- A. General Contractor shall be solely responsible for safety design, construction and coordination with agencies having jurisdiction. If such plan varies from shoring system standards established by Construction Safety Orders, plan shall be prepared by registered civil or structural engineer.
- B. Nothing herein shall be deemed to allow use of shoring, sloping or protective system less effective than that required by Construction Safety Orders of California State Division of Industrial Safety.
- C. When trenching through paved surface, provide steel trench plates to cover open trenches daily until trenches are backfilled.

1.13 SEASONAL LIMITS

- A. No backfill material shall be placed, spread or rolled during unfavorable weather conditions. When work is interrupted by heavy rains, full operations shall not be resumed until field tests indicate that moisture content and density of fill are satisfactory.
- B. Material above optimum moisture shall be processed per Section 31 0000, Part 3, Article "Subgrade Preparation".

1.14 TESTING

- A. General: Refer to Section 31 0000, Part 1, Article "Testing" and Part 3, Article "Testing and Observation".

TRENCHING AND BACKFILLING
SECTION 31 2333
3595001

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Backfill materials: Pipeline and conduit trench backfill as shown on the plans and as specified below.
 - 1. ¾ inch crush rock.
 - 2. Native Materials: Soil native to Project Site, free of wood, organics, and other deleterious substances. Rocks shall not be greater than 3-inches.
 - 3. Sand: Fine granular material, free of organic matter, mica, loam or clay.
 - 4. Lean Mix Concrete: 3 sacks of cement per yard plus sand.
 - 5. Class 2 aggregate base, ¾" rock, per Caltrans Section 26-1.02B
 - 6. Controlled Density Fill: 3 sack slurry backfill.
- B. Water: Furnish all required water for construction purposes, including compaction and dust control. Water shall be potable.
- C. Provide other bedding and backfill materials as described and specified in Section 33 0000, Section 33 4000 and Divisions 22 and 26.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verification of Conditions:
 - 1. Examine areas and conditions under which work is to be performed.
 - 2. Identify conditions detrimental to proper or timely completion of work and coordinate with General Contractor to rectify.

3.2 INSTALLATION

- A. Perform work in accordance with pipe manufacturer's recommendations, as herein specified and in accordance with drawings.

3.3 TRENCHING

- A. Make all trenches open vertical construction with sufficient width to provide free working space at both sides of trench around installed item as required for caulking, joining, backfilling and compacting; not less than 12 inches wider than pipe or conduit diameter, unless otherwise noted.
- B. Carefully excavate around existing utilities to avoid unnecessary damage. The contractor shall anticipate and perform hand work near existing utilities as shown on the survey, without additional claims or cost.
- C. Trench straight and true to line and grade with bottom smooth and free of edges or rock points.

TRENCHING AND BACKFILLING
SECTION 31 2333
3595001

- D. Where depths are not shown on the plans, trench to sufficient depth to give minimum fill above top of installed item measured from finish grade above the utility as follows:
1. Sewer pipe: depth to vary
 2. Storm drain pipe: depth to vary
 3. Water pipe - Fire Supply: 36 inches
 4. Water pipe – Domestic Supply: 30 inches

3.4 BACKFILL

- A. Pipe Trench Backfill is divided into three zones:
1. Bedding: Layer of material directly under the pipe upon which the pipe is laid.
 2. Pipe Zone: Backfill from the top of the bedding to 6 inches (compacted) over the top of the pipe.
 3. Upper Zone: Backfill between top of Pipe Zone and to surface of subgrade.
- B. Bedding: Type of material and degree of compaction for bedding backfill shall be as defined in the Details and Specifications.
- C. Pipe Zone and Upper Zone Backfill:
1. Type of material and degree of compaction Pipe Zone and Upper Zone Backfill shall be as required by Drawings, Details, & Specifications.
 2. Upper Zone Backfill shall not be placed until conformance of Bedding and Pipe Zone Backfill with specified compaction test requirements has been confirmed.
 3. Backfill shall be brought up at substantially the same rate on both sides of the pipe and care shall be taken so that the pipe is not floated or displaced. Material shall not be dropped directly on pipe.
- D. Backfill Compaction:
1. Backfill shall be placed in layers which, when compacted shall not exceed 6 inches in thickness. Each layer shall be spread evenly and thoroughly mixed to insure uniformity. Do not backfill over, wet, frozen or soft subgrade surfaces. Employ a placement method that does not disturb or damage foundation walls, perimeter drainage, foundation damp-proofing, waterproofing or protective cover.
 2. When moisture content of fill material is below that required to achieve specified density, add water until proper moisture content is achieved. When moisture content is above that required, aerate by blading or other methods until specified moisture content is met; see Section 31 0000, Part 3, Article "Subgrade Preparation".
 3. After each layer has been placed, mixed and spread evenly, it shall be thoroughly compacted to 95% of maximum dry density while at specified moisture content. Compact each layer over its entire area until desired density has been obtained.
 4. Compaction: All backfill operations shall be observed by the Inspector of Record and/or Geotechnical Engineer. Field density tests shall be made to check compaction of fill material. If densities are not satisfactory, Contractor will be

TRENCHING AND BACKFILLING
SECTION 31 2333
3595001

required to change equipment or procedure or both, as required to obtain specified densities. Notify Inspector and Architect at least 24 hours in advance of any operation.

E. Backfill in Areas Previously Lime or Cement Treated

1. Where trenching occurs in areas that have been lime or cement treated, class 2 aggregate bases or approved controlled density backfill material shall be used for the top 12-inches minimum of the trench or thickness shall match the depth of treated material.

3.5 TRENCH AND SITE RESTORATION

- A. Finished surface of trenches shall be restored to a condition equal to, or better than the condition as existed prior to excavation work.

3.6 PROTECTION

- A. Protect existing surfaces, structures, and utilities from damage. Protect work by others from damage. In the event of damage, immediately repair or replace to satisfaction of Owner.
- B. Repair existing landscaped areas to as new condition. Replant trees, shrubs or groundcover with existing materials if not damaged or with new materials if required. Replace damaged lawn areas with sod, no seeding will be permitted.
- C. Replace damaged pavement with new compatible matching materials. Concrete walks to be removed to nearest expansion joint and entire panel replaced. Asphalt to be cut neatly and replaced with new materials.
- D. Any existing materials removed or damaged due to trenching to be returned to new condition.

3.7 SURPLUS MATERIAL

- A. Remove excess excavated material, unused materials, damaged or unsuitable materials from site.

3.8 CLEANING

- A. Refer to Section 01 7700.
- B. Contractor will keep the work areas in a clean and safe condition so his rubbish, waste, and debris do not interfere with the work of others throughout the project and at the completion of work.
- C. After completion of work in this section, remove all equipment, materials, and debris. Leave entire area in a neat, clean, acceptable condition.

TRENCHING AND BACKFILLING
SECTION 31 2333
3595001

END OF SECTION

s:\master specifications\division 31 - earthwork\31 2333_trenching and backfilling.docx
Received from WCEI: October 20, 2012; Updated 9-2-21

PART 1 – GENERAL

1.1 WORK INCLUDED

Provide all labor, materials, and tools necessary for the complete installation of a poured in place safety surfacing system composed of a wearing layer upper membrane and an underlying impact attenuation cushion layer as outlined in these specifications. The system should consist of but not necessarily be limited to the following:

- A. Section includes: Resilient playground surfacing poured in place system.
- B. Related work: Playground equipment and resilient playground surfacing sub base.
- C. Quality Assurance: Manufacturer should have manufactured and installed playground poured in place safety surfaces for a minimum of 5 years and meet current ASTM F-1292 Test Criteria. The installation of the poured in place product should be completed by FLEXGROUND. Manufacturer's detailed installation procedures should be submitted to the Architect and made part of the Bid Specifications.

1.2 SUBMITTALS

Prospective manufacturers and/or installers of the poured in place safety surfacing system should be required to comply with the following:

- A. The manufacturer must be experienced in the manufacturing of a poured in place safety surfacing system and provide references of five (5) specific installations in the last three (3) years.
- B. The installer must provide competent workmen skilled in this specific type of poured in place safety surfacing system installation. The designated supervisory personnel on the project must be competent in the installation of this material, including mixing of the materials, and spreading and compacting the materials correctly.
- C. Installation should be in accordance with ASTM F1292 for Impact Attenuation of surface system under and around playground equipment. The poured in place system to be installed in compliance with the Critical Fall Height as determined by the Playground Equipment.
- D. IPEMA Certification specific to poured in place safety surfacing.
- E. IPEMA certification specific to ½" layer of 1-4mm TPV over cushion layer .5mm TPV or EPDM IPEMA certification not acceptable.
- F. Manufacturer should provide written instructions for recommended maintenance practices.
- G. Manufacturer should submit color samples for customer verification. Color samples shall be 6" x 6" of ½" top wear course layer with aromatic or aliphatic binder – per client selection or specification; or 8 oz clear plastic jars with specified colored granules. Sample submittal format per client preference.

1.3 DEFINITIONS

PLAYGROUND PROTECTIVE SURFACES
SECTION 32 1816.13
3595001

- A. EPDM granules: EPDM rubber (ethylene propylene diene monomer (M-class) rubber), a type of synthetic rubber, is an elastomer characterized by a wide range of applications. The M refers to its classification in ASTM standard D-1418; the M class includes rubbers having a saturated chain of the polymethylene type.
- B. Critical Fall Height: A critical fall height (CFH) is the maximum height of fall from play equipment to the ground. It is important to note that safety surfaces do not prevent injury but aim to lessen the severity of any injury that may occur on falls from height.
- C. Fall Height: Fall height is a measurement defined as the vertical distance between a designated play surface and the protective surfacing beneath it.
- D. TPV: Thermoplastic Vulcanized Elastomer. Developed using resin and synthetic rubber with higher UV stabilization.
- E. SBR: Styrene-butadiene or styrene-butadiene rubber (SBR) describe families of synthetic rubbers derived from styrene and butadiene.

1.4 ASTM TESTING STANDARDS – FlexGround Standard meets or exceeds all required ASTM standards below.

- A. ASTM D624 Standard Test Method for Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomers.
- B. ASTM D2859 Standard Test Method for Flammability of Finished Textile Floor Covering Materials
- C. ASTM E303 Standard Test Method for Measuring Surface Frictional Properties Using the British Pendulum Tester
- D. ASTM F1292 Standard Specification for Impact Attenuation of Surface Systems Under and Around Playground Equipment
- E. ASTM F1951 Standard Specification for Determination of Accessibility of Surface Systems Under and Around Playground Equipment
- F. ASTM C1028 Standard Test Method for Determining the Static Coefficient of Friction of Ceramic Tile and Other Like Surfaces by the Horizontal Dynamometer Pull Meter Method – This standard replaces ASTM D2047
- G. ASTM D412 Standard Test Methods for Vulcanized Rubber and Thermoplastic Rubbers and Thermoplastic Elastomers- Tension

1.5 WARRANTY AND MAINTENANCE

The bidder and/or poured in place safety surfacing manufacturer must provide the following:

- A. The poured in place safety surfacing manufacturer should provide a warranty to the owner that covers defects in materials and workmanship of the rubber for a period of **FIVE (5) years** from the date of Substantial Completion.

PLAYGROUND PROTECTIVE SURFACES
SECTION 32 1816.13
3595001

- B. The manufacturer's warranty should include general wear and tear. The warranty should specifically exclude vandalism, high heel punctures, acts of war or acts of nature beyond the control of the owner or the manufacturer.
- C. All poured in place warranties should be limited to repair or replacement of the affected areas and should include all necessary materials, labor, transportation costs, etc. to complete said repairs. All warranties are contingent on the full payment by the owner of all pertinent invoices and adherence to any required maintenance procedures.
- D. The installer should clean the jobsite of excess materials and, if necessary, backfill any excavation around the perimeter with earth or other appropriate fill material.
- E. The manufacturer should instruct the owner's personnel on proper maintenance and repair of the ENDURAFLEX safety surface.

PART 2 – PRODUCTS

- A. The FLEXGROUND ENDURAFLEX, or equal, poured in place safety surfacing system should be in accordance with the following:
- B. A dual durometer poured in place system with a wearing layer upper membrane and an underlying impact attenuation cushion layer. The finished surface should be porous and capable of being installed at varying thickness to comply with the Critical Fall Height requirements of the playground equipment.
- C. FLEXGROUND primer is a 100% solids urethane primer/sealer. It is designed with low viscosity and penetrating abilities making this an ideal priming urethane.
- D. The cushion layer should be a mixture of black recycled SBR rubber buffings mixed with a 100% solids moisture cured MDI Polyurethane binder or aliphatic (100 pounds of SBR rubber buffings to 12 pounds of binder) installed at the appropriate thickness. As an upgrade, or if recycled SBR rubber buffings are not available, 5/8" chunk rubber with correct amount of urethane for impact attenuation and longevity may be used. **Chunk rubber shall not include SBR derived from rubber tires.** It must be high quality preconsumer recycled rubber containing EPDM. The cushion layer should be porous.
- E. The ENDURAFLEX wearing surface should be manufactured from 1-4mm Thermoplastic Vulcanized (TPV) virgin colored rubber granules bonded by FLEXGROUND binder, 100% solids moisture cured Polyurethane binder or aliphatic (110 pounds of TPV to 22 pounds of binder), and applied to a minimum thickness of 1/2" (12.7 mm) over the cushion layer.
- F. The system color should be selected from Manufacturer's Color Chart by owner prior to bid.
- G. High Wear Coating: Flexgrout as manufactured by Flexground, or corresponding equal.

PART 3 – EXECUTION

3.1 GENERAL

PLAYGROUND PROTECTIVE SURFACES
SECTION 32 1816.13
3595001

- A. Install all systems in full accordance with manufacturer's recommendations.
- B. Slope across finished product shall not be greater than 2% in any direction. Contractor shall carefully checked grades during installation of perimeter curb and play equipment access points to assure that all slopes are less than 2%.

3.2 SITE PREPARATION AND BASE

The ENDURAFLEX site preparation and base should be in accordance with the following:

- A. The sub-base will have a slope as per design.
- B. The base aggregate should consist of free-draining stone compacted to 95%, thickness per plan. Finish slope of porous aggregate should be 2% from the centerline of the area to the perimeter, and the grade should not vary more than a quarter inch (1/4") in ten feet (10').
- C. The sub-base should be compacted using vibrating tamper, to approximately 95% Proctor density.
- D. The sub-grade should no longer have any vegetation.
- E. Subgrade prior to aggregate installation: Sublevel grade is to be compacted prior to the ABC aggregate installation. Particular attention should be paid to areas of disturbed earth such as where footers for playground equipment enter the ground. Concrete should be poured to the top of sublevel surface.
- F. The poured in place safety surfacing manufacturer and architect will accept the aggregate base in writing prior to the installation of the poured in place system.
- G. Any alterations must be agreed between all parties.

3.3 INSTALLATION

- A. The poured in place safety surfacing installer should strictly adhere to the installation procedures outlined under these sections. Any variance from these requirements should be accepted in writing by the manufacturer's onsite representative and submitted to the architect/owner, verifying that the changes do not in any way affect the warranty.

3.4 PERIMETER

- A. A urethane primer should be applied to concrete, asphalt or wood surfaces at a rate of 200-250 square feet per gallon. The entire area does not need to be primed at once, instead, prime about 700 square feet at a time. This procedure should be continued until all areas are complete.
- B. The urethane primer should be applied to any playground equipment that will be surrounded by the poured in place safety surfacing system.

3.5 CUSHION LAYER

- A. Provide a single pour installation for each area. No seams allowed in material.

PLAYGROUND PROTECTIVE SURFACES
SECTION 32 1816.13
3595001

- B. The components of the poured in place safety surfacing should be mixed on site in a mixer to ensure a comprehensive mix according to manufacturer's instructions.
- C. The cushion layer comprised of SBR buffings shall be mixed with the MDI moisture cure polyurethane binder at a rate of 12% of the total weight of the material thoroughly so that the binder is evenly dispersed into the rubber base.
- D. The cushion layer comprised of non-tire derived SBR & EPDM Chunk Rubber shall be mixed with the appropriate amount of urethane so that the binder is evenly dispersed into the rubber base.
- E. The cushion layer mix should then be spread and troweled to the desired depth and allow to cure for 24 hours.

3.6 WEAR COURSE LAYER

- A. Provide a single pour installation for each area. No seams allowed in finished product.
- B. The wear course layer should be mixed with 1-4mm TPV granules and urethane binder at a rate of 20% of the total weight of the materials so the granules are covered thoroughly and evenly.
- C. The wear course layer mix should be spread and troweled to a depth of a half inch ($\frac{1}{2}$ ") immediately after the application of primer.
- D. Where seams are required due to color change, a step configuration with a 4" overlap will be constructed to maintain wear surface integrity.
- E. The finished texture should be slip resistant, smooth and even.
- F. The poured in place surface should be allowed to cure for 24-72 hours or until dry to the touch.

3.7 GROUT SEALER AT HIGH WATER AREAS

- A. Provide at base of main access point to structure, at bottom of slides, beneath swings, other high traffic, high wear areas.
- B. The wear course layer should be sealed with a thermoplastic composite grout. FLEXGROUT should be spread with a trowel at a rate of 1 gallon per 30 square feet. Pressure should be applied to the trowel with enough force to push the grout into the wear course layer, rendering it impermeable. The finished texture should be slip resistant and even.
- C. The poured in place surface should be allowed to cure for 24-72 hours or until dry to the touch.
- D. Color Seal - The color seal should consist of a water based composite liquid. Color seal should be rolled (or can be sprayed) to completely cover entire surface. The color seal should be allowed to cure for 24-72 hours or until dry to touch.

3.8 CLEAN UP

PLAYGROUND PROTECTIVE SURFACES
SECTION 32 1816.13
3595001

- A. Trailer/ Large truck access will be necessary for the installation. In the case that access for trailer/truck is not available the owner or general contractor will be responsible for transporting material to the job site.
- B. Crew is responsible for protecting the surface only while on site. General Contractor or owner shall be responsible for the security of the surfacing overnight during installation, as well as during the surfacing's curing period upon completion of the install.
- C. Crew will leave site clean and shall remove all trash and debris.
- D. Owner/General contractor shall provide a dumpster for all waste and trash.

END OF SECTION

PART 1 – GENERAL

1.1 SUMMARY

- A. Provide all labor, materials, equipment, and tools necessary for the complete installation of an attenuated synthetic grass infill system as outlined in these specifications. The system should consist of but not necessarily be limited to the following:
- B. A vertical draining field base consisting of a four-inch layer of compacted $\frac{3}{4}$ " Class 2 aggregate compacted to 95% and four-inch layer of Class 2 permeable base compacted to 90-95% relative compaction.
- C. A complete synthetic grass system, consisting of:
 - 1. Synthetic turf
 - 2. Cushion layer
 - 3. An infill system, consisting of a specially formulated non-expansive, coated, clean, dust free and specially sized silicon dioxide bead (Envirofill brand preferred).
- D. Quality Assurance: Manufacturer should have manufactured and installed synthetic grass surfaces for a minimum of 5 years. Manufacturer's detailed installation procedures should be submitted to the Architect and made part of the Bid Specifications.

1.2 RELATED REQUIREMENTS

- A. Section 01 5000, Temporary Facilities and Controls.
- B. Section 31 0000, Earthwork.
- C. Section 33 4000, Storm Drainage Utilities.

1.3 REREENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. ASTM D624 Standard Test Method for Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomers.
- C. ASTM D2859 Standard Test Method for Flammability of Finished Textile Floor Covering Materials
- D. ASTM E303 Standard Test Method for Measuring Surface Frictional Properties Using the British Pendulum Tester
- E. ASTM F1292 Standard Specification for Impact Attenuation of Surface Systems Under

and Around Playground Equipment

- F. ASTM F1951 Standard Specification for Determination of Accessibility of Surface Systems Under and Around Playground Equipment
- G. ASTM C1028 Standard Test Method for Determining the Static Coefficient of Friction of Ceramic Tile and Other Like Surfaces by the Horizontal Dynamometer Pull Meter Method – This standard replaces ASTM D2047
- H. ASTM D412 Standard Test Methods for Vulcanized Rubber and Thermoplastic Rubbers and Thermoplastic Elastomers- Tension

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Submittal Procedures:
 - 1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
 - 2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
 - 3. Sustainable Design Submittals shall comply with the additional requirements of Section 01 8113, Sustainable Design Requirements.
- B. Coordination:
 - 1. General Contractor shall coordinate work as herein specified, in accordance with drawings and as required to complete scope of work with all related trades.

1.5 ACTION SUBMITTALS

- A. Provide supplier's descriptive literature for all products to demonstrate compliance with specified attributes:

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For contractor / Installer.
Prospective manufacturers and/or installers of the turf should be required to comply with the following:
 - I. The turf manufacturer must be experienced in the manufacture of a no nail synthetic grass system and provide references of five (5) specific installations in the last three (3) years.
 - J. The turf installer must provide competent workmen skilled in no nail synthetic grass installation. The designated supervisory personnel on the project must be competent in the installation of this material, including gluing seams and proper installation of the infill mixture.
- K. Installation should be in accordance with ASTM F1292 for Impact Attenuation of surface system under and around playground equipment. The poured in place system to be installed in compliance with the Critical Fall Height as determined by the Playground

Equipment (if any).

- L. Manufacturers should provide written instructions for recommended maintenance practices.

1.7 CLOSEOUT SUBMITTALS

- A. Guarantee: Submit subcontractor's guarantee.

1.8 QUALITY ASSURANCE

- A. Contractor / Installer shall have been in business for five (5) years providing/finishing similar size projects and complexity.
- B. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.
- C. All materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.

1.9 DELIVERY, STORAGE AND HANDLING

- A. Transport, store and handle in strict accord with the local jurisdiction.

1.10 FIELD CONDITIONS

- A. Contractor shall acquaint himself with all existing site conditions. If unknown active utilities are encountered during work, notify Architect promptly for instructions. Failure to notify will make Contractor liable for damage to these utilities arising from Contractor's operations subsequent to discovery of such unknown active utilities.
- B. Trench dewatering may be necessary. Contractor shall provide any and all tools, equipment and labor necessary for trench dewatering no matter what the source. Dewatering shall be continuous until all site utilities are installed and backfilled.

1.11 PROTECTION

- A. Adequate protection measures shall be provided to protect workers and passers-by on and off the site. Adjacent property shall be fully protected throughout the operations. Blasting will not be permitted. Prevent damage to adjoining improvements and properties both above and below grade. Restore such improvements to original condition should damage occur. Replace trees and shrubs outside building area disturbed by operations. Repair all trenches in grass areas with new sod (seeding not permitted) and "stake-off" for protection.
- B. Contractor shall be solely and completely responsible for working conditions at the job site, including safety of all persons and property during performance of the work. This requirement shall apply continuously and shall not be limited to normal working hours.
- C. Any construction review of the Contractor's performance conducted by the Architect or Owner is not intended to include review of the adequacy of the Contractor's safety measures, in, on or near the construction site.

SYNTHETIC TURF
SECTION 32 1816.16
3595001

- D. Provide shoring, sheeting, sheet piles and or bracing to prevent caving, erosion or gullying of sides of excavation.
- E. Surface Drainage: Provide for surface drainage during period of construction in manner to avoid creating nuisance to adjacent areas. Keep all excavations free from water during entire progress of work, regardless of cause, source or nature of water.
- F. Adjacent streets and sidewalks shall be kept free of mud, dirt or similar nuisances resulting from earthwork operations.
- G. The site and adjacent influenced areas shall be watered as required to suppress dust nuisance.
- H. Trees: Carefully protect existing trees which are to remain.

1.12 TRENCH SAFETY PROVISIONS

- A. General Contractor shall be solely responsible for safety design, construction and coordination with agencies having jurisdiction. If such plan varies from shoring system standards established by Construction Safety Orders, plan shall be prepared by registered civil or structural engineer.
- B. Nothing herein shall be deemed to allow use of shoring, sloping or protective system less effective than that required by Construction Safety Orders of California State Division of Industrial Safety.
- C. When trenching through paved surface, provide steel trench plates to cover open trenches daily until trenches are backfilled.

1.13 SEASONAL LIMITS

- A. No backfill material shall be placed, spread or rolled during unfavorable weather conditions. When work is interrupted by heavy rains, full operations shall not be resumed until field tests indicate that moisture content and density of fill are satisfactory.
- B. Material above optimum moisture shall be processed per Section 31 0000, Part 3, Article "Subgrade Preparation".

1.14 TESTING

- A. General: Refer to Section 31 0000, Part 1, Article "Testing" and Part 3, Article "Testing and Observation".

1.15 WARRANTY AND MAINTENANCE

- A. The bidder and/or the turf manufacturer must provide the following:
- B. The turf manufacturer should provide a warranty to the owner that covers defects in materials and workmanship of the turf for a period of **FIVE (5) years** from the date of Substantial Completion, and **TWO (2) years** on seams.
- C. The manufacturer's warranty should specifically exclude vandalism, acts of War and acts of Nature beyond the control of the owner of the manufacturer.

- D. All turf warranties should be limited to repair or replacement of the affected areas and should include all necessary materials, labor, transportation costs, etc. to complete said repairs.
- E. All warranties are contingent upon full payment by the owner of all pertinent invoices and owner, at owner's expense, completing a full power-brooming and "top-off" of lost infill at two-year intervals from date of substantial completion.
- F. The bidder should provide a maintenance program to the owner. The warranty should be subject to compliance with said maintenance program in addition to items named above.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

The synthetic turf material and resilient cushion should be in accordance with the following:

- A. Acceptable Manufacturer: Beyond Grass Premium or Tencate Grass.
- B. Or approved equal.

2.2 SYSTEM REQUIREMENTS

- A. A poured in place system with a synthetic grass wearing layer upper membrane and an underlying impact attenuation cushion layer. The finished surface should be porous and capable of being installed at varying thickness to comply with Critical Fall Height requirements of playground equipment.
- B. The cushion layer should be a mixture of black recycled rubber mixed with a 100% solids moisture cured aromatic Polyurethane binder (100 pounds of rubberized cushion layer to 12 pounds of binder) installed at the appropriate thickness.
- C. Synthetic Turf shall be:
 - 1. A 1-1/2" monofilament polyethylene with brown thatch yarn, formulated for superior wear resistance and a secondary proprietary polyethylene thatch. Product must have built-in antimicrobial protection to inhibit the growth of bacteria, mold, mildew, and reduce odor.
 - 2. The system should be tufted with a minimum of 60 ounce of yarn per square yard. The system should also include a primary woven polypropylene backing and a polyurethane secondary backing. Finish coating shall be at 22 ounces per square yard.
 - 3. The machine gauge shall be 1/2". Tufted pile height is 1-1/2".
 - 4. Total fabric weight shall be at least 88 ounces per square yard.
 - 5. The finished product should also include perforations to ensure drainage greater than 30 inches per hour. Non-perforated systems should not be acceptable alternates for purposes of this specification.

- D. The turf should be delivered in 15' wide rolls.
- E. All lines, numbers and markings indicated on plans should be permanently inlaid. Painted lines should not be an acceptable alternative for purposes of this specification.
- F. The fiber should be green in color to simulate natural grass as closely as possible and treated with UV inhibitor, guaranteed a minimum of eight years.
- G. The infill system should be an a non-expansive engineered coated, clean, dust free and specially sized silicon dioxide beads.
- H. Latex backed turf shall not be acceptable. All adhesives must also be latex free.

PART 3 – EXECUTION

3.1 SITE PREPARATION AND BASE

- A. The sub-base will have a slope per plan.
- B. The base aggregate should consist of a minimum of four inches (4") of ¾" Class 2 aggregate compacted to 95% and four inches (4") of ¾" Class 2 permeable aggregate base compacted to between 90%-95%.
- C. The sub base should be installed in two inch (2") lifts to appropriate thickness.
- D. The sub-base should be compacted using vibrating tamper, to approximately 95% Proctor density.
- E. The sub-base should no longer have any vegetation.
- F. Subgrade prior to aggregate installation: Sublevel grade is to be compacted prior to the ABC aggregate installation. Particular attention should be paid to areas of disturbed earth such as where footers for playground equipment enter the ground. Concrete used to fill said areas/footers should be poured to the top of sublevel surface.
- G. The sub-base installer and architect will accept the aggregate base in writing prior to the installation of the poured in place system.
- H. Any alterations must be agreed between all parties.

3.2 INSTALLATION

The synthetic turf safety surfacing installer should strictly adhere to the installation procedures outlined under these sections. Any variance from these requirements should be accepted in writing by the manufacturer's onsite representative and submitted to the architect/owner, verifying that the changes do not in any way affect the warranty.

A. Cushion Layer

1. The components of the poured in place safety surfacing should be mixed on site in a mixer to ensure a comprehensive mix according to manufacturer's instructions.
2. The cushion layer comprised of SBR buffings shall be mixed with the aromatic moisture cured polyurethane binder at a rate of 12% of the total weight of the material thoroughly so that the binder is evenly dispersed into the rubber base.
3. The cushion layer comprised of non-tire derived SBR & EPDM Chunk Rubber shall be mixed with the appropriate amount of urethane so that the binder is evenly dispersed into the rubber base.
4. The cushion layer mix should then be spread and troweled to the desired depth and allow to cure for 24 hours.

B. Synthetic Turf Layer

1. The synthetic grass should be cut and laid out across the area, and utilizing standard state-of-the-art gluing procedures, each roll should be seamed to the next.
2. The edge of the synthetic turf should be stapled or nailed to header/anchor board.
3. A strip of seam tape should be used to seam the rolls of material. The specified glue should be a one part urethane adhesive (SeamTight).

C. Infill

1. The infill material shall be spread evenly, at a rate of 2 lbs per square foot with a large fertilizer type spreader. The infill will be spread in strict accordance with the turf installer's specifications.
2. Between each application of infill, the field area should be brushed with a motorized rotary nylon broom.
3. Caution: Too much fiber exposed (not enough infill) will cause the fibers to mat or crush with heavy foot traffic. This will lead to premature wearing of the fiber and will void any manufacturer's warranty. No Crumb Rubber shall be used as infill.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Aggregate.
 - 2. Asphalt paving.
 - 3. Seal coat.
 - 4. Wood headers and stakes.
 - 5. Pavement marking.
 - 6. Precast concrete bumpers.

1.2 RELATED REQUIREMENTS

- A. Section 01 5000, Temporary Facilities and Controls.
- B. Section 01 6116, Volatile Organic Compound (VOC) Restrictions, for VOC limits pertaining to adhesives, sealants, fillers, primers, and coatings.
- C. Section 01 8113, Sustainable Design Requirements, for CAL-Green **[and Collaborative for High Performance Schools (CHPS)]** general requirements and procedures.
- D. Section 31 0000, Earthwork.
- E. Section 31 2333, Trenching and Backfilling.
- F. Section 32 8000, Irrigation.
- G. Section 33 0000, Utilities.
- H. Section 33 4000, Storm Drainage Utilities.

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CAL Green), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- C. Local Jurisdiction: Any work within the street, highway or right-of-way shall be performed in accordance with the requirement of the governmental agencies having jurisdiction, and shall not begin until all of those governing authorities have been notified.
- D. ASTM International (ASTM):

ASPHALT CONCRETE PAVING
SECTION 32 1200
3595001

1. D698-00 Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures, Using 5.5 lb (2.49 Kg) Rammer and 12 inch (304.8 mm) Drop.
2. D1556-00 Test Method for Density of Soil in Place by the Sand-Cone Method.
3. D1557-02 Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 10 lb. (4.54 Kg) Rammer and 18 inch (457 mm) Drop.
4. D6628-16 Standard Specification for Color of Pavement Marking Materials.
5. D3017-05 Test Methods for Moisture Content of Soils and Soil-Aggregate Mixture by Nuclear Methods (Shallow Depth).
6. D4318-05 Test Method for Liquid Limit, Plastic Limit, and Plasticity Limit.

E. CALTRANS Standard Specifications.

F. CAL-OSHA, Title 8, Section 1590 (e).

1.4 ADMINISTRATION REQUIREMENTS

A. Submittal Procedures:

1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
3. Sustainable Design Submittals shall comply with the additional requirements of Section 01 8113, Sustainable Design Requirements.

1.5 ACTION SUBMITTAS

A. Provide supplier's descriptive literature for all products to demonstrate compliance with specified attributes.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Contractor / Installer.

B. Sustainable Design:

1. General
 - a. Submit information necessary to establish and document compliance with the California Green Building Standards Code.
 - b. Sustainable design submittals are in addition to other submittals.
2. The following information shall be provided:
 - a. Adhesives and Sealants: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.
 - b. Paints and Coatings: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.

1.7 CLOSEOUT SUBMITTALS

- A. Guarantee: Submit subcontractor's guarantee.

1.8 QUALITY ASSURANCE

- A. Contractor / Installer shall have been in business for five (5) years providing/finishing similar size projects and complexity.
- B. Contractor shall be solely responsible for all subgrades built. Any repairs resulting from inadequate compaction is the responsibility of the contractor.
- C. The representatives of the Owner's testing lab will not act as supervisor of construction, nor will they direct construction operations. Neither the presence of the Owner's testing lab representatives nor the testing by the Owner's testing lab shall excuse the contractors or subcontractors for defects discovered in their work during or following completion of the project. Correcting inadequate compaction is the sole responsibility of the contractor.
- D. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.
- E. All materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.
- F. Contractor shall provide verification that asphalt mix temperature meets the requirements of this specification at time of application.
- G. Tests (See Part 1, Article "Testing").

1.9 DELIVERY, STORAGE AND HANDLING

- A. Transport, store and handle in strict accord with the local jurisdiction.

1.10 FIELD CONDITIONS

- A. Environmental Requirements:
 - 1. Base Course: Do not lay base course on muddy subgrade, during wet weather, or when atmospheric temperature is below 40 degrees F.
 - 2. Asphalt Surfacing: Do not apply asphaltic surfacing on wet base, during wet weather, or when atmospheric temperature is below 50 degrees F.

1.11 EXISTING SITE CONDITIONS

- A. Contractor shall acquaint himself with all site conditions. If unknown active utilities are encountered during work, notify Architect promptly for instructions. Failure to notify will make Contractor liable for damage to these utilities arising from Contractor's operations subsequent to discovery of such unknown active utilities.

1.12 PROTECTION

- A. Adequate protection measures shall be provided to protect workmen and passers-by on and off the site. Adjacent property shall be fully protected throughout the operations. Blasting will not be permitted. Prevent damage to adjoining improvements and properties both above and below grade. Restore such improvements to original condition should damage occur. Replace trees and shrubs outside building area disturbed by operations.
- B. In accordance with generally accepted construction practices, the Contractor shall be solely and completely responsible for working conditions at the job site, including safety of all persons and property during performance of the work. This requirement shall apply continuously and shall not be limited to normal working hours.
- C. Any construction review of the Contractor's performance conducted by the owner's representative is not intended to include review of the adequacy of the Contractor's safety measures, in, on, or near the construction site.
- D. Surface Drainage: Provide for surface drainage during period of construction in manner to avoid creating nuisance to adjacent areas. The contractor shall make a reasonable effort on a daily basis to keep all excavations and the site free from water during entire progress of work, regardless of cause, source, or nature of water.
- E. Adjacent streets and sidewalks shall be kept free of mud, dirt or similar nuisances resulting from earthwork operations.
- F. The site and adjacent influenced areas shall be watered as required to suppress dust nuisance. Dust control measures shall be in accordance with the local jurisdiction.

1.13 SEASONAL LIMITS

- A. No fill material shall be placed, spread or rolled during unfavorable weather conditions. When work is interrupted by rains, fill operations shall not be resumed until field tests indicate that moisture content and density of fill are satisfactory.

1.14 TESTING

- A. General: Refer to Section 01 4523 – TESTING & INSPECTION SERVICES AND STRUCTURAL TESTS AND INSPECTIONS LIST, DSA-103.
- B. Geotechnical Engineer: Owner is retaining a Geotechnical Engineer to determine compliance of fill with Specifications, and to direct adjustments in fill operations. Costs of Geotechnical Engineer will be borne by Owner; except those costs incurred for re-tests or re-inspection will be paid by Owner and backcharged to Contractor.

PART 2 - PRODUCTS

2.1 DESIGN AND PERFORMANCE CRITERIA

- A. Sustainable Design:

**ASPHALT CONCRETE PAVING
SECTION 32 1200
3595001**

1. VOC emissions for field-applied adhesives, sealants, and sealant primers must comply with limits specified in Section 01 6116.
2. VOC emissions for field-applied paints and coatings must comply with limits specified in Section 01 6116.

2.2 MATERIALS

- A. Sterilant: Soil sterilizer shall be CIBA GEIGY's Pramitol 25-E, Treflan EC or Thompson-Hayward Casoron.
 1. Soil sterilizer shall be applied in strict accordance with manufacturer's instructions.
- B. Base Course Aggregate: State Specifications, Section 26, Class 2 aggregate base (3/4" max.).
- C. Asphalt Binder: Steam-refined paving asphalt conforming to State Specifications, Section 92, viscosity grade PG 64-10. Asphalt binder additives for HMA per Caltrans approved list of manufacturers.
- D. Liquid Asphalt Tack Coat: Per CALTRANS section 94.
- E. Surface Course Aggregate: Mineral aggregates for Type "B" asphalt concrete, conforming to State Specifications 39-2.02, Type B, 1/2" maximum, medium gradient. 3/8" maximum gradient at Playcourt.
- F. Seal Coat: shall be a pre-mixed asphalt emulsion blended with select fillers and fibers such as:
 1. "Park-Top No. 302", Western Colloid Products.
 2. "Overcoat", Reed and Gram.
 3. "Drivewalk", Conoco Oil.
- G. Wood Headers and Stakes: Pressure treated.
- H. Pavement Marking: Colors as directed by Architect. Colors of painted traffic stripes and pavement markings must comply with ASTM D6628.
 1. Waterborne traffic line - colors white, yellow and red, State specification PTWB-01R3.
 2. Waterborne traffic line for the international symbol of accessibility and other curb markings – blue, red and green, Federal specification TT-P-1952F.
- I. Precast Concrete Bumpers: 3000 psi at 28 day minimum strength; 48" length unless otherwise indicated; provide with steel dowel anchors and concrete epoxy.
- J. Pavement Epoxy; K-Lite; KtepX-590; Ennis Epoxy HPS2 or an approved equal.
- K. Crack Filler; QPR model CAR08, 10oz asphalt crack filler; Star STA-FLEX Trowel Grade crack filler or approved equal.

ASPHALT CONCRETE PAVING
SECTION 32 1200
3595001

- L. Reclaimed Asphalt Paugment (RAP). HMA Type A or Type B may be produced using RAP providing it does not exceed 15% or the aggregate blend.

2.3 MIXES

- A. General: Plant mixed conforming to State Specifications, Section 39, Type B, 1/2" maximum, medium grading. 3/8" maximum grading shall be used at hardcourt.
- B. Temperature of Hot Mix Asphalt: Not less than 275 degrees F nor more than 325 degrees F when added to aggregate.
- C. Temperature of Hot Mix Aggregate: Not less than 250 degrees F nor more than 325 degrees F when asphalt is added.
- D. Temperature of Hot Mix Asphalt Concrete: Asphalt shall be not less than 285 degrees at time of application, nor more than 350 degrees. Asphalt not meeting the required temperature shall not be used.
- E. Temperature of Warm Mix Asphalt: Mixing and placement; per the approved manufactures heat range recommendations for mixing and placement.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Conditions of Work in Place: Subsurfaces which are to receive materials specified under this Section shall be carefully examined before beginning work hereunder, and any defects therein shall be reported, in writing, to the Architect. Work shall not be started until such defects have been corrected. Starting of work shall imply acceptance of conditions as they exist.

3.2 PREPARATION

- A. Sub-Grade: Clean, shape and compact to hard surface free from elevations or depressions exceeding 0.05' in 10' from true plan. Compact per Section 31 0000. Compaction and moisture content shall be verified immediately prior to placement of aggregate base. Proof roll subbase in presence of geotechnical engineer prior to placement of aggregate base.

3.3 INSTALLATION

- A. Headers:
 - 1. General: Install as edging to asphalt paving, except where adjoining existing pavement, concrete curbs, walks or building.
 - 2. Existing Headers: Remove existing headers where new paving will join existing. Saw cut existing asphalt to provide clean edge.
 - 3. Lines and Levels: Install true to line and grade. Cut off tops of stakes 2-inches below top of header so they will not be visible on completion of job.

**ASPHALT CONCRETE PAVING
SECTION 32 1200
3595001**

B. Asphalt Paving:

1. Base Course: Install in accord with State Specifications, Section 26. Compact to relative compaction of not less than 95%, ASTM D1557. The material shall be deposited on the subgrade in such a manner as to provide a uniform section of material within five percent tolerance of the predetermined required depth. Deposition will be by spreader box or bottom dump truck to prevent segregation of the material. The material so deposited on the subgrade shall have sufficient moisture which, in the opinion of the Architect is adequate to prevent excessive segregation. It shall then be immediately spread to its planned grade and cross section. Undue segregation of material, excessive drifting or spotting of material will not be permitted. If in the opinion of the site geotechnical engineer, the material is unsuitably segregated, it shall be removed or completely reworked to provide the desired uniformity of the material.
 - a. Moisture content and compaction of base material shall be tested immediately prior to placement of asphalt paving.
2. Sterilant: Apply specified material at manufacturer's recommended rate. Applicator of sterilant material shall be responsible for determining location of all planter areas. Apply specified material over entire base course area just prior to application of asphalt. Follow manufacturer's printed directions.
3. Liquid Asphalt Tack Coat: Apply as "tack coat" to all vertical surfaces of existing paving, curbs, walks, and construction joints in surfacing against which paving is to be placed.
4. Asphalt Concrete Surface Course:
 - a. Comply with State Specifications, 39-6 except as modified below.
 - 1) Final gradation shall be smooth, uniform and free of ruts, humps, depressions or irregularities, with a minimum density of 91% of the theoretical maximum specific gravity determined by California Test Method #309. Maximum variation 1/8 inch in 10' when measured with steel straightedge in any one direction. Test paved areas for proper drainage by applying water to cover area. Correct portions that do not drain properly by patching with plant mix. In no case shall accessible parking spaces or loading and unloading areas exceed 2% slope in any direction.
 - 2) Asphalt material shall be delivered to the project site in a covered condition to maintain acceptable temperature.
5. Placement and adjustment of Frames, Covers, Boxes and Grates: The Contractor shall set and adjust to finish grade all proposed and existing frames, covers, boxes, and grates of all manholes, drop inlets, drain boxes, valves, cleanouts, electrical boxes and other appurtenant structures prior to placement of asphaltic concrete.
6. Water Testing: All paved areas shall be water tested, to check drainage, in the presence of the project inspector prior to placement of seal coat. The surface of asphalt paving shall not vary more than 1/8 inch above or below the grade established on the plans. If variations in grade are present, they will be corrected by overlaying paving and/or pavement removal and replacement as directed by the Architect.

**ASPHALT CONCRETE PAVING
SECTION 32 1200
3595001**

7. Patching: Cut existing paving square and plumb at all edges to be joined by new paving. In trenches; grind existing asphalt on each side of trench 3" wide x 1/2 the depth of the section. Apply tack coat to vertical surfaces before installing new work. Warp carefully to flush surface, with seal over joints, and feather edge. Sawcut, remove and patch existing paving where cutting is necessary for installation of piping or conduits under Divisions 15, 16 and 33.
8. Seal Coat:
 - a. Seal coat shall be applied no sooner than 30 days from time of asphalt placement.
 - b. Surface Preparation: surface shall be clean of all dirt, sand, oil or grease. Hose down entire area with a strong jet of water to remove all debris. Remove soft, loose, or otherwise damaged areas of asphalt concrete to full depth of damage and replace with compacted asphalt concrete as specified herein. Minor holes and imperfections may be patched using hot mix asphalt or mastic using sand/SS-1-H. Use wire brush for removal of oil and grease; prime with shellac or synthetic resin as recommended by manufacturer of pavement sealer material.
 - c. Seal Coat Seal Application: Thoroughly mix materials in the presence of the onsite inspector. Failure to do so will be cause for rejection. Apply in accordance with manufacturer's written instructions.
 - a. The minimum application rate for each applied coat shall be 30gals per 1000 sq. ft. Two coats of sealcoat will be required.
 - b. Clean-Up and Precautions: As recommended by pavement sealer material manufacturer.
 - d. Clean-Up and Precautions: As recommended by pavement sealer material manufacturer.
- C. Pavement Marking: painted pavement markings shall be done only after the seal coat has thoroughly dried. On clean surfaces to be painted with traffic paint of dust, dirt, grime, oil, rust or other contaminants which will impair the quality of work or interfere with proper bond of paint coats. Surfaces shall be cleaned to the extent and by whatever means that will satisfactorily accomplish the purpose without damage to asphalt concrete. Provide measured layouts, temporary markings, templates, and other means necessary to provide required marking. Prepare and apply paint in accordance with manufacturer's instructions; paint shall be applied by spray and shall achieve complete coverage free from voids and thin spots. Where indicated on the Drawings, paint parking stall strips, lettering, arrows, accessible symbols, playground markings, game striping, maps, etc. on concrete paving or asphalt concrete paving. Paint stripes shall be 4 inches wide (except otherwise indicated) and applied with two (2) coats of herein specified Traffic Line Paint; white (except as otherwise specified or indicated).
 1. International Accessible Symbol: Symbol shall be white figures on a blue background. Blue shall be equal to color No. 15090 in Fed. Std. 595c. Lines and symbols shall be accurately formed and true to line and form; lines shall be straight and uniform in width. Painted edges shall be clean cut and free from raggedness, and corners shall be cut sharp and square. Tolerances: Apply striping within a tolerance 1/2 inch in 50 feet. Apply markings and striping to widths indicated with a tolerance of 1/4 inch on straight sections and 1/2 inch on curved sections.

ASPHALT CONCRETE PAVING
SECTION 32 1200
3595001

- D. Colors: As directed by Architect
- E. Precast Concrete Bumpers: Install where shown, using steel dowels, and epoxy applied for length to wheel stop without damage to bumpers or asphalt concrete paving.

3.4 CLEANING

- A. Upon completion of work of this Section promptly remove from the working area all scraps, debris and surplus material of this Section.
- B. Clean excess material from surface of all concrete walks and utility structures.

END OF SECTION

*s:\master specifications\division 32 - site improvements\32 1200_asphalt concrete paving.docx
Received from WCEI: December 18, 2020, Format Updated 9-8-21*

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Concrete curbs and gutters.
2. Concrete pavement, sidewalks and ramps.
3. Steel reinforcing for flatwork and curbs.
4. Truncated domes.

1.2 RELATED REQUIREMENTS

- A. Section 01 6116, Volatile Organic Compound (VOC) Restrictions; for VOC limits pertaining to adhesives, sealants, fillers, primers, and coatings.
- B. Section 01 8113, Sustainable Design Requirements, for CAL-Green **[and Collaborative for High Performance Schools (CHPS)]** general requirements and procedures.
- C. Division 31, Earthwork.
- D. Section 32 1200, Asphalt Concrete Paving.

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CALGreen), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- C. American Concrete Institute (ACI):
1. 117: Specification for Tolerances for Concrete Construction and Materials and Commentary.
 2. 211.1: Standard Practice for Selecting Proportions for Normal, Heavyweight and Mass Concrete.
 3. 301: Specifications for Structural Concrete.
 4. 302.1R: Guide to Concrete Floor and Slab Construction.
 5. 305R: Guide to Hot Weather Concreting.
 6. 306R: Guide to Cold Weather Concreting.
 7. 308R: Guide to External Curing of Concrete.
 8. 318: Building Code Requirements for Structural Concrete and Commentary.
 9. 347R: Guide to Formwork for Concrete.
- D. ASTM International (ASTM):

1. A615/A615M: Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement.
 2. A706/A706M: Standard Specification for Deformed and Plain Low-Alloy Steel Bars for Concrete Reinforcement.
 3. C33/C33M: Standard Specification for Concrete Aggregates.
 4. C94/C94M: Standard Specification for Ready-Mixed Concrete.
 5. C143/C143M: Standard Test Method for Slump of Hydraulic-Cement Concrete.
 6. C150/C150M: Standard Specification for Portland Cement.
 7. C260/C260M: Standard Specification for Air-Entraining Admixtures for Concrete.
 8. C309: Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete.
 9. C330/C330M: Standard Specification for Lightweight Aggregates for Structural Concrete.
 10. C494/C494M: Standard Specification for Chemical Admixtures for Concrete.
 11. C618: Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete.
 12. C920: Standard Specification for Elastomeric Joint Sealants.
 13. C1107/C1107M: Standard Specification for Packaged Dry, Hydraulic Cement Grout (Non-Shrink).
 14. C1315: Standard Specification for Liquid Membrane-Forming Compounds Having Special Properties for Curing and Sealing Concrete.
 15. D1751: Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types).
 16. D5893/D5893M: Standard Specification for Cold Applied, Single Component, Chemically Curing Silicone Joint Sealant for Portland Cement Concrete Pavements.
- E. Concrete Reinforcing Steel Institute (CRSI):
1. Manual of Standard Practice.
 2. Placing Reinforcing Bars.
- F. State of California, Department of Transportation (Caltrans):
1. Division of Engineering Services:
 - a. California Test 342: Method of Test for Surface Skid Resistance with the California Portable Skid Test.
 2. Standard Specifications.
 - a. Section 51, Concrete Structures.
 - b. Section 52, Reinforcement.
 - c. Section 73, Concrete Curbs and Sidewalks.
 - d. Section 90, Concrete.
- G. US Government General Services Administration (GSA/SAE):

1. GSA/SAE AMS-STD-595A: Colors Used In Government Procurement.

1.4 ADMINISTRATIVE REQUIREMENTS

A. Submittal Procedures:

1. Action Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
3. Sustainable Design Submittals shall comply with the additional requirements of Section 01 8113, Sustainable Design Requirements.

1.5 ACTION SUBMITTALS

A. Shop Drawings: Joint pattern layout for walks and pavement.

B. Product Data:

1. A complete list of materials proposed to be used for the site concrete work including, but not limited to, sand, gravel, admixtures, surface treatments, coloring agents, sealers, cast-in-place accessories, forming and curing products, concrete mix designs, reinforcing materials, joint materials, curing materials, and detectable warning surface.
2. Manufacturer's descriptive literature for products proposed for use. Include installation instructions, and maintenance instructions.

C. Concrete Mix Design: The Contractor shall submit three copies of each proposed mix design for each class of concrete in accordance with ACI 301, Sections 3.9 "Proportioning on the Basis of Previous Field Experience or Trial Mixture," or 3.10 "Proportioning Based on Empirical Data." The Contractor shall submit a separate mix design for concrete to be placed by pumping, in addition to the mix design for concrete to be placed directly from the truck chute.

1. The following information shall be included in the concrete mix design:
 - a. Proportions of cement, fine and coarse aggregate, and water.
 - b. Water-cement ratio, 28-day compressive design strength, slump, and air content.
 - c. Type of cement and aggregate.
 - d. Special requirements for pumping.
 - e. Range of ambient temperature and humidity for which design is valid.
 - f. Special characteristics of mix, which require precautions in mixing, placing, or finishing techniques to achieve specified finished product.
2. Do not begin concrete production until mixes have been reviewed and approved by Engineer.
 - a. Review of mix design by the Architect and Engineer shall in no way relieve the subcontractor of his responsibility for the performance of the concrete.

D. Qualification Data: For manufacturer

- E. Delivery tickets as specified for ready-mixed concrete.
- F. Sustainable Design:
 - 1. General:
 - a. Submit information necessary to establish and document compliance with the California Green Building Standards Code.
 - b. Sustainable design submittals are in addition to other submittals.
 - 2. The following information shall be provided:
 - a. Adhesives and Sealants: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.
 - b. Paints and Coatings: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.

1.6 CLOSEOUT SUBMITTALS

- A. Guarantee: Submit subcontractor's guarantee.

1.7 QUALITY ASSURANCE

- A. Qualifications:
 - 1. Manufacturer of ready-mixed concrete products shall meet ASTM C94/C94M requirements for production facilities and equipment.
- B. Design, erect, support, brace and maintain formwork and shoring to safely support all loads that might be applied until such loads can be carried by concrete.
- C. The Contractor shall perform work in accordance with ACI 301.
- D. Use only new materials and products.
- E. Single-Source Responsibility: Use materials and products of one manufacturer whenever possible.
- F. Materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.
- G. Testing to determine compliance with the work of this Section will be the responsibility of the Contractor.
 - 1. Cement and reinforcing shall be tested in accordance with CBC Section 1910A. Testing of reinforcing may be waived in accordance with Section 1910A.2 when approved by the Engineer and DSA.
 - 2. Testing will be performed by an independent testing and inspecting agency in accordance with Section 01 4523, Testing and Inspection Services, and paid for by the Owner.
 - 3. Refer to Article FIELD QUALITY CONTROL in Part 3 of this Section for additional requirements.

4. Cost of retests and coring due to low strength or defective concrete will be paid by the Owner and back-charged to the Contractor.
- H. Sieve analysis from testing laboratories identifying rock/sand percentages within the concrete mix; or class 2 aggregate base shall have the current Project name and Project location identified on the report. Outdated analytical reports greater than 90 days old will not be accepted.
- I. Mockups: Provide on-site mockup panels for each type of exposed colored concrete flatwork showing texture and color before proceeding with finish to be used on this Project.
 1. Construct sample panels after review and approval of samples.
 2. Size: Minimum 5 feet square and have at least one longitudinal and one transverse joint unless a more specific note indicates otherwise on Drawings.
 3. Construct sample panels at location approved by Architect.
 4. Construct sample panels in ample time to allow for finishing and curing before requesting Architect to review.
 5. Follow procedures used on accepted samples.
 6. Include saw-cut and tooled joints to match method and appearance proposed for use in completed work.
 7. Prepare successive sample panels as required until finish, color, and appearance is approved by Architect.
 8. Do not remove sample panels until authorized in writing by the Architect and all concrete work has been approved.

1.8 DELIVERY, STORAGE AND HANDLING

- A. Deliver undamaged products to job in manufacturer's sealed containers and/or original bundles with tags and labels intact.
- B. Store materials in protected, dry conditions off of ground and in areas so as to not interfere with the progress of the Work.
- C. Transport, store and handle in strict accordance with the manufacturer's written recommendations.
- D. Store cement in weather tight building, permitting easy inspection and identification. Protect from dampness. Lumpy or stale cement will be rejected.
- E. Aggregates: Prevent excessive segregation, or contamination with other materials or other sizes of aggregate. Use only one supply source for each aggregate stock pile.

1.9 FIELD CONDITIONS

- A. Make and be responsible for all field dimensions necessary for proper fitting, slopes, and completion of work. Report discrepancies to Architect before proceeding.
- B. Do not place concrete during rain without adequate protection.

- C. The Contractor shall conform to ACI 306R when mixing and placing concrete during cold weather. Provide sufficient protection when daily temperatures drop below 40 degrees F.
- D. The Contractor shall conform to ACI 305R when mixing and placing concrete during hot weather. When air temperature exceeds 100 degrees F adjust concrete mix with retarding admixture in design mix, and adequately test and take additional measures as directed by concrete supplier.
- E. The Contractor shall maintain access for vehicular and pedestrian traffic as required for other construction activities. Use temporary striping, flagmen, barricades, warning signs, and warning lights as required.
- F. Placing in hot weather: Comply with ACI 305R. Concrete shall be delivered, placed and finished in a sufficiently short period of time to avoid surface dry checking.
 - 1. Concrete shall not exceed 85 degrees F at time of placement.
 - 2. Concrete shall be kept wet continuously after tempering until implementation of curing compound procedure in accordance with this specification.
 - 3. Evaporation Retarder: Apply evaporation retarder to concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 pounds per square foot per hour, before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.
- G. Placing in Cold Weather: Comply with ACI 306R. Protect from frost or freezing. No antifreeze admixtures are permitted.
 - 1. When placing concrete during freezing or near-freezing weather, mix shall have temperature of at least 50 degrees F but not more than 90 degrees F.
 - 2. Concrete shall be maintained at temperature of at least 50 degrees F for not less than 72 hours after placing or until it has thoroughly hardened.
 - 3. Provide necessary thermal coverings for any flat work exposed to freezing temperatures.

PART 2 - PRODUCTS

2.1 DESIGN AND PERFORMANCE CRITERIA

- A. Contractor shall comply with requirements applicable to this Section for concrete materials, admixtures, bonding materials, curing materials, surface sealers and others as required.
- B. Concrete walking surfaces shall have a coefficient of friction not less than 0.30 and will be subject to testing to verify compliance as specified in Article FIELD QUALITY CONTROL.
 - 1. The coefficient of friction will be measured by California Test 342 before pavement is opened to public traffic, but not sooner than 7 days after concrete placement.

2. Contractor shall notify the Architect and Project Inspector of pavement having a coefficient of friction less than 0.30.
- C. Sustainable Design:
1. VOC emissions for field-applied adhesives, sealants, and sealant primers must comply with limits specified in Section 01 6116.
 2. VOC emissions for field-applied paints and coatings must comply with limits specified in Section 01 6116.

2.2 FORMING MATERIALS

- A. Form Material: Steel, wood, or other suitable material of size and strength to resist movement during concrete placement and to retain horizontal and vertical alignment until removal. Use straight forms, free of distortion and defects. Use flexible spring steel forms or laminated boards to form radius bends as required. The forms shall be of a depth equal to the depth of curbing or sidewalk, and so designed as to permit secure fastening together at the tops. Coat forms with non-staining type coating that will not discolor or deface surface of concrete.
1. Concrete Exposed to View: 5/8-inch minimum APA B-B Plyform, steel or "Sonotube" forms by Sunoco, 888-875-8754, or equal.
 2. Concrete Concealed from View: 5/8-inch minimum APA B-B Plyform, steel or 1 x 8 DF, Number 2 Grade or better.
- B. Form Ties: Snap off metal of fixed length, leaving no metal within 1-1/2 inches of surface and no fractures, spalls or other surface defects larger than 1 inch diameter; manufactured by Burke, Dayton Superior, or equal.
- C. Spreaders: Metal. Wood is not permitted.
- D. Form Coating: Coat forms with non-staining material that will not discolor or deface surface of concrete or leave any residue on concrete that would interfere with surface coating as approved by the Architect.
- E. Chamfer Strips: Rigid polyvinyl chloride, 3/4-inch x 3/4-inch, in maximum possible lengths, manufactured by Burke, Greenstreak, Vulco, or equal.

2.3 REINFORCING MATERIALS

- A. Reinforcement Bars: New billet steel deformed bars conforming to requirements of ASTM A615/A615M or ASTM A706/A706M; Grade 60.
1. Bars for dowels installed through expansion joints or construction joints to existing sidewalks or concrete features shall be smooth or if deformed shall be sleeved on one end for slippage.
- B. Reinforcing Supports: Galvanized metal chairs or spacers or metal hangers, accurately placed 3 feet on center each way, staggered, with each support securely fastened to steel reinforcement in place.

1. Bottom bars in footings may be supported with 3-inch concrete blocks with embedded wire ties.
2. Concrete supports without wire ties will not be allowed.

2.4 CONCRETE MATERIALS

- A. Cement: Portland cement in accordance with ASTM C150/C150M, Type II, low alkali.
- B. Concrete Aggregates: Graded from coarse to fine in accordance with ASTM C33/C33M.
 1. Normal Weight Aggregates: Clean and free from deleterious coatings, clay balls, roots, and other extraneous materials, and in conformance with ASTM C33/C33M, except as otherwise specified. Combined grading shall meet limits of ASTM C33/C33M.
 - a. Size: Not be larger than one-fifth of the narrowest dimension between forms, or larger than three-fourths of the minimum clear spacing between reinforcing bars.
 2. Lightweight Aggregates:
 - a. General: Durable particles suitably processed, washed and screened without adherent coatings, free of materials with deleterious reactivity to alkali in cement, and conforming to ASTM C330/C330M.
 - b. Fine aggregate shall be natural sand, or sand prepared from stone or gravel, with grains free of silt, loam and clay.
- C. Water: Potable, clean, and in accordance with ASTM C94/C94M, free from injurious amounts of oil, acids, alkalis, salts, scale, organic materials or other deleterious matter, and in compliance with ACI 318 Section 26.4.1.3.
- D. Fly Ash: Western Fly Ash, conforming to ASTM C618 for Class N or Class F materials and in accordance with CBC Section 1903A.6.
 1. Class C is not permitted.
 2. Proportions: Not more than 15 percent (by weight) may be substituted for portland cement.

2.5 ADMIXTURES

- A. Water Reducing Admixture: Admixture to improve placing, reduce water cement ratio and ultimate shrinkage; "WRDA 64" by GCP Applied Technologies, or equal conforming to ASTM C494/C494M and ACI 318 Section 3.6.
 1. Water reducing admixture may be used subject to prior approval by the Architect, Engineer, and the Testing Lab.
 2. Proposed product and quantity shall be included in original design mix.
- B. Air-Entraining Admixture: "Daravair 1000" by GCP Applied Technologies or equal conforming to ASTM C260 and ACI 318, section 26.4.1.4.
 1. Proportion air entraining concrete to attain specified minimum 28-day compressive strength.

- 2. Total air entrainment in concrete shall be not less than 4 percent or more than 6 percent of the volume of concrete.
- C. Glare Reduction Colorant: Concentrated pigment dispersions designed to permanently color concrete; "Chromix L10 Base-Black" by Sika Corporation, or equal. *Was within 2.2 H.1*

2.6 CURING MATERIALS

- A. Clear Curing Compound: Water-based membrane-forming concrete curing compound in accordance with ASTM C309 and C1315; "Aqua Resin Cure Clear" by Burke CO, "1100" by W.R. Meadows, or equal.

2.7 ADDITIONAL MATERIALS AND COMPONENTS

- A. Concrete Bonding Agent: The following, or equal, conforming to ASTM C1059/C1059M.
 - 1. "Weld-Crete" by Larson Products Corporation, 800-633-6668.
 - 2. "Daraweld C" by GCP Applied Technologies, 877-423-6491.
- B. Patching Mortar: One-component, trowel applied, migrating-corrosion-inhibitor enhanced, polymer-modified, shrinkage-compensated, fiber reinforced, micro-silica enhanced, cementitious repair mortar for horizontal, vertical, and overhead applications; "Meadow-Crete GPS" by W.R. Meadows, or equal.
- C. Non-Shrink Grout: Premixed, non-metallic, no chlorides, non-staining and non-shrinking conforming to ASTM C1107/C1107M; "MasterFlow 713" by Master Builders Solutions, a division of BASF, 800-433-9517, or equal.
- D. Drainage Rock Base: 3/4-inch aggregate size conforming to Class 2 Aggregate Base as defined in Caltrans Standard Specifications Section 26, or equal clean free-draining gravel or crushed rock as recommended by the Geotechnical Engineer.
- E. Expansion Joint Material: Preformed 3/8-inch fiber material, with bituminous binder manufactured for use as concrete expansion joint material and conforming to ASTM D1751 and approved by Architect.
 - 1. Furnish joint fillers in one-piece lengths for full width being placed, wherever possible. Where more than one length is required, lace or clip joint-filler sections together.
- F. Joint Sealant for Expansion Joints in Concrete: Weather and UV resistant, single component, cold applied silicone sealant, Type S, conforming to ASTM D5893/D5893M; ASTM C920, Grade P, Class 25, Use T.
 - 1. Self-Leveling: "DOWSIL 890-SL Silicone Joint Sealant" by Dow Chemical Company, or equal.
 - 2. At Slopes Exceeding 5 Percent: Non-sagging; "DOWSIL 888 Silicone Joint Sealant" by Dow Chemical Company, or equal.
 - 3. Color: As standard with manufacturer.

- G. Pre-Formed Plastic Expansion Joint Caps: Polystyrene, with removable tops; "Snap Cap" by W. R. Meadows, Tex-Trude expansion caps, or equal.
- H. Truncated Domes: Vitrified Polymer Composite (VPC) cast-in-place detectable/tactile warning surface tiles complying with Americans with Disabilities Act (ADA) and the California Code of Regulations (CCR) Title 24, Part 2, Chapter 11B; "Armor-Tile", "Access Tile Tactile Systems," or equal.
 - 1. Color: Shall be yellow and approximate 33538 of GSA/SAE AMS-STD-595A in accordance with CBC Section 11B-705.1.1.3.1.
- I. Traffic Paint for Accessibility Striping at Stairs: VOC compliant, water-based, vinyl acrylic copolymer fast drying emulsion and specifically formulated as a traffic marking paint; "Setfast" with "Duckback" abrasive additive by Sherwin-Williams, "SAFE-STRIDE" by Wooster Products, Inc., or equal.
 - 1. Colors: As selected by Architect. [Yellow]
- J. Cast Abrasive Accessibility Strips and Stairs: Extruded aluminum with integral anchor and filled with abrasive granules in epoxy binder; Model ST-SF-N by Nystrom, Inc., 800-547-2635, Type T-24 by American Safety Tread Company, Inc., 800-245-4881, Type WP-24A by Wooster Products, Inc., 330-264-2844, or equal.
 - 1. Colors: As selected by Architect. [Yellow]

2.8 CONCRETE DESIGN AND CLASS

- A. Designed Strength and Classes of Concrete: The following mixes are not applicable to concrete items exceeding 4 feet in height above the adjacent grade.
 - 1. Class "B": Concrete shall have 1 inch maximum size aggregate, shall have 3000 pounds per square inch minimum at 28 day strength with a maximum water to cementitious ratio no greater than 0.50.
 - a. Location of Use: Exterior slabs, including walks, vehicular paved surfaces, manhole bases, poured-in-place drop inlets, curbs, valley gutters, curb and gutter, and other concrete of like nature.
 - 2. Class "D" concrete of 1 inch maximum size aggregate shall have 3500 pounds per square inch 28 day strength with a maximum water to cementitious materials ratio of 0.55.
 - a. Location of Use: Footings and retaining walls not attached to buildings, and planter walls, monument signs, and other site concrete not described for use in Class "B".
- B. Slump Limits: Provide concrete, at point of final discharge of proper consistency as tested in accordance with ASTM C143/C143M with slumps of 4 inches, plus or minus 1 inch.
- C. Mix Design: Concrete shall be designed for strength in accordance with provisions of CBC Section 1905A.

1. Should the Contractor desire to pump concrete, a modified mix design will need to be submitted for review.
 2. Fly ash may be used in concrete to improve workability in amounts up to 15 percent of the total cementitious weight.
- D. Air Entrainment: Provide at concrete paving / flatwork, including concrete ramps and stairs in accordance with local jurisdiction minimum requirements, but no less than 3 percent of the volume of concrete.
- E. Glare Reduction Additive:
1. General:
 - a. Provide at exterior concrete slabs, walks, ramps, stairs, including bleachers, and other exposed flatwork to eliminate glare.
 - b. Omit glare reduction colorant where color hardener, integral color, and stain treatment of concrete are scheduled.
 2. Quantity: As required to match approved sample but not exceed 2 pounds of colorant per cubic yard of concrete.
 3. Add colorant to mix in accordance with manufacturer's printed instructions.
- F. Coloring Agent:
1. Quantity: Add pigment as required to result in hardened concrete color consistent with approved sample but not exceeding maximum dosage per sack of cement as recommended by manufacturer based on total cementitious materials of mix design.
 2. Add pre-mixed colorant bags to mix in accordance with manufacturer's printed instructions.

2.9 MIXING OF CONCRETE

- A. Conform to requirements of CBC Chapter 19A.
- B. Concrete shall be mixed until there is uniform distribution of material and mass is uniform and homogenous; mixer must be discharged completely before the mixer is recharged.
- C. Concrete shall be Ready-Mixed Concrete: Mix and deliver in accordance with the requirements set forth in ASTM C94/C94M and ACI 301. Batch Plant inspection may be waived in accordance with CBC Section 1705A.3.3, when approved by the Project Engineer and DSA.
1. Furnish batch certificates for each batch discharged and used in the work.
 2. Approved Testing Laboratory shall check the first batching at the start of the work and furnish mix proportions to the Licensed Weighmaster.
 3. Licensed Weighmaster shall identify materials as to quantity and to certify to each load by ticket.
 4. Delivery tickets are to accompany each truck and shall be kept in the job superintendent's file. Delivery tickets must indicate the following information or be subject to rejection:

- a. Name of Project.
 - b. Supplier of concrete.
 - c. Truck identity and ticket serial number.
 - d. Date of delivery.
 - e. Brand of cement.
 - f. Cement content.
 - g. Strength classification.
 - h. Batching time.
 - i. Point of deposit.
 - j. Total amount of water.
 - k. Weight of aggregate.
 - l. Daily temperature.
 - m. Number of cubic yards in load.
 - n. Admixture content.
 - o. Name of Contractor.
 - p. Name of driver.
 - q. Time loaded and first mixing of concrete.
 - r. Reading of revolution counter.
 - s. Color additive.
5. Ticket shall be transmitted to Project Inspector by truck driver with load identified thereon. Project Inspector will not accept load without load ticket identifying mix and will keep daily record of pours, identifying each truck, its load and time of receipt, and will transmit two copies of record to DSA.
6. At end of project, Weighmaster shall furnish affidavit to DSA on form satisfactory to DSA, certifying that all concrete furnished is in conformance with proportions established by mix designs.
7. Placement of concrete shall occur as rapidly as possible after batching and in a manner which will assure that the required quality of the concrete is maintained. In no case may concrete be placed more than 90 minutes from batch time.
- a. When air temperature is between 85 and 90 degrees F, reduce maximum batching to discharge time from 90 minutes to 75 minutes.
 - b. When air temperature is above 90 degrees F, reduce maximum batching to discharge time to 60 minutes.
8. Water may be added to the mix only if neither the maximum permissible water-cement ratio nor the maximum slump is exceeded.
- a. The quantity of water used for each batch shall be accurately measured.
 - b. In no case shall more than 10 gallons of water be added to a full 9-yard load, or 1 gallon per yard on remaining concrete within the drum, providing load tag indicates at time of mixing at plant an allowance for additional water.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Confirm general layout, grade, and joint pattern layout with the Architect prior to placing concrete.
- B. Verify that gradients and elevations of the base are correct, and that the base is dry.
- C. Contractor shall report in writing to the Architect prevailing conditions that will adversely affect satisfactory execution of the work of this Section.
 - 1. Do not proceed with work until unsatisfactory conditions have been corrected.
- D. Forms and reinforcements are subject to approval by the Project Inspector as specified in Article FIELD QUALITY CONTROL.

3.2 PREPARATION

- A. Remove frost, water, and other foreign materials from form surfaces, reinforcement, and embedded items against which concrete will be placed.
- B. When the ambient temperature necessitates the use of cold or hot weather concreting, make provisions in advance of concrete placement.
- C. Before placing concrete, clean tools and equipment, and remove debris from areas to receive concrete.
- D. Clean reinforcing and other embedded items of coatings, oil, mud and soil that may impair bond with concrete.
- E. Slab-On-Grade: After subgrade has been approved by Geotechnical Engineer, install specified drainage rock base material to thickness shown. Rock base shall be implemented and compacted in accordance with the Geotechnical Report and recommendations of the Geotechnical Engineer.

3.3 INSTALLATION – FORMWORK

- A. Form material shall be straight, true, sound and able to withstand deformation due to loading and effects of moist curing. Materials which have warped or delaminated, or require more than minor patching of contact surfaces, shall not be reused.
- B. Build forms to shapes, lines, grades and dimensions indicated. Construct formwork to maintain tolerances required by ACI 301. Forms shall be substantial, tight to prevent leakage of concrete, and properly braced and tied together to maintain position and shape. Butt joints tightly and locate on solid backing. Chamfer corners where indicated. Form bevels, grooves and recesses to neat, straight lines. Construct forms for easy removal without hammering, wedging or prying against concrete.
- C. Space clamps, ties, hangers and other form accessories so that working capacities are not exceeded by loads imposed from concrete or concreting operations.

- D. Build openings into vertical forms at regular intervals if necessary to facilitate concrete placement, and at bottoms of forms to permit cleaning and inspection.
- E. Build in securely braced temporary bulkheads, keyed as required, at planned locations of construction joints.
- F. Before placement of reinforcing steel, coat faces of all forms to prevent absorption of moisture from concrete and to facilitate removal of forms. Apply specified material in conformance with manufacturer's written directions.
 - 1. Seal all cut edges.
 - 2. Before re-using form material, inspect, clean thoroughly, and recoat.
- G. Slope tie-wires downward to outside of wall.
- H. Brace, anchor and support all cast-in items to prevent displacement or distortion.
- I. During and immediately after concrete placing, tighten forms, posts and shores. Readjust to maintain grades, levels and camber.
- J. Concrete Paving, Curbs, Curb and Gutters, Ramps:
 - 1. Expansion Joints: Install at locations indicated, and so that maximum distance between joints is 20 feet for exterior concrete unless otherwise shown. Expansion joint material shall be full depth of concrete section. Recess for snap cap and sealant when required.
 - 2. Curbs, Valley Gutter, and Curb & Gutter: Install expansion joints at 60 feet on center, except when placing adjacent to concrete walks, the expansion joints shall align with the expansion joints shown for the concrete walks. Expansion joint material shall be full depth of concrete section. Recess for snap cap and sealant when required.
 - 3. Isolation Joints: 3/8-inch felt between walls and exterior slabs or walks so that paved areas are isolated from all vertical features, unless specifically noted otherwise on plans.
 - 4. Exterior Concrete Paving: Install expansion joints at 20 feet on center maximum, both directions, unless shown otherwise on plans.
 - 5. Ramps: Whether shown or not, all ramps shall have control joints and expansion joints.
 - a. Control joints on ramps shall be aligned and placed in between the vertical posts for the handrails. The curbs, if required shall have control joints that align with the handrail posts.
 - b. Expansion joints shall be placed at the upper, intermediate, and bottom landings.
- K. Inspection: Refer to Article FIELD QUALITY CONTROL.

3.4 INSTALLATION – REINFORCING

- A. General: Reinforcing shall be accurately placed at locations indicated on the drawings within required tolerances and providing required clearances. Reinforcement shall be

secured prior to placement of concrete such that tolerances and clearances are maintained. Coverage shall be in accordance with Section 1907A.7 of the CBC.

1. Reinforcement must be in place before concreting is begun.
 2. Keep a person on the job to maintain position of reinforcing as concrete is placed.
 3. All expansion and construction joints in concrete shall have dowels of size and spacing as shown on the Drawings, or as approved by Architect.
 4. Give notice whenever pipes, conduits, sleeves, and other construction interferes with placement; obtain method of procedure to resolve interferences.
- B. Additional reinforcing steel shall be placed around all utility boxes, valve boxes, manhole frames and covers that are located within the concrete placements.
1. The bars shall be placed so that there will be a minimum of 1-1/2-inch clearance and a maximum of 3-inch clearance. The reinforcing steel shall be placed mid-depth of concrete slab.
- C. At right angles or intersections of concrete walks, additional 2 feet x 2 feet #5, 90 degree bars shall be added at all inside corners for additional crack control. The bars shall be placed 2 inches from concrete forms and supports, at mid-depth of slab.
- D. Reinforcing steel shall be adequately supported by approved devices on centers close enough to prevent any sagging.
- E. Placing Tolerances:
1. In accordance with ACI 301 or CRSI/WCRSI Recommended Practice for Placing Reinforcing Bars, unless otherwise shown.
 2. Clear distance between parallel bars in a layer shall be no less than 1 inch, the maximum bar diameter shall not exceed 1-1/2 times the maximum size of coarse aggregate.
- F. Splices:
1. General: Unless otherwise shown on drawings, splice top reinforcing at midspan between supports, splice bottom reinforcing at supports, and stagger splices. Bar laps shall be wired together. Reinforcing steel laps shall be as follows:
 - a. Length of Lap Splices in Concrete:
 - 1) No. 4 bar: 24 inches minimum.
 - 2) No. 5 Bar: Not less than 62 bar diameters.
 - 3) No. 6 Bar: 56 inches minimum.
 - 4) No. 7 Bars and Larger: Not less than 93 bar diameters.
 - b. All splices shall be staggered at 5 feet minimum from adjacent splices.
- G. Inspection: Refer to Article FIELD QUALITY CONTROL.

3.5 PLACING OF CONCRETE – GENERAL

- A. Adjacent finish surfaces shall be protected at all times during the concrete pour and finishing. Verify that all formwork is tight and leak-proof before concrete is poured. Finish work defaced during the concrete pour and finishing shall be replaced at no extra cost to Owner.
- B. Remove wood chips, sawdust, dirt, loose concrete and other debris just before concrete is to be poured. Use compressed air for inaccessible areas. Remove all standing water from excavations.
- C. Transport concrete from mixer to place of final deposit as rapidly as practicable by methods which will prevent separation or loss of ingredients. Deposit as close as practicable in final position to avoid re-handling or flowing. Partially hardened concrete must not be deposited in work. Concrete shall not be wheeled directly on top of reinforcing steel.
- D. Keep excavations free of standing water, but moisture condition sub-grade before concrete placement.
- E. Placing: Once started, continue concrete pour continuously until section is complete between predetermined construction joints. Prevent splashing of concrete onto adjacent forms or reinforcement and remove such accumulation of hardened or partially hardened concrete from forms or reinforcement before work proceeds in that area. Free fall of concrete shall not to exceed 4'-0" in height. If necessary, provide lower openings in forms to inject concrete and to reduce fall height.
- F. Remove form spreaders as placing of concrete progresses.
- G. Place footings as monolithic and in one continuous pour.
- H. Compacting: Concrete shall be compacted by mechanical vibrators.
 - 1. Concrete shall be thoroughly worked around reinforcement and embedded fixtures and into corners of forms.
 - 2. Vibrating shall not be applied to concrete which has already begun to initially set or be continued so long as to cause segregation of materials.

3.6 REMOVAL OF FORMS

- A. Remove without damage to concrete surfaces.
 - 1. Sequence and timing of form removal shall insure complete safety of concrete structure.
 - 2. Forms shall remain in place for not less than the following periods of time. These periods represent cumulative number of days during which temperature of air in contact with concrete is 60 degrees F and above.
 - a. Vertical Forms of Foundations, Walls and All Other Forms Not Covered Below: 5 days.
 - b. Concrete Paving Edge Screeds or Forms: 7 days.

3. Concrete shall not be subjected to superimposed loads (structure or construction equipment) until it has attained its full design strength and not for a period of at least 21 days after placing. Concrete systems shall not be subjected to construction loads in excess of design loads.
- B. Patching: Install specified patching mortar per manufacturer's recommendations. Repairs to defective concrete which affect the strength of any structural concrete member or component are subject to approval by the architect and DSA.

3.7 CONCRETE PAVING

- A. Concrete paving shall be formed and finished to required line and grades true and flat with a maximum tolerance of 1/8-inch in 10 feet for flatness and to slopes indicated.
- B. Concrete vibrator shall be used to assist concrete placement. Contractor shall have spare concrete vibrator on site during concrete placement.
- C. Thoroughly water and soak the subgrade of exterior concrete paving, curbs, curb and gutters, with multiple daily waterings for at least three days or as required to achieve required moisture content prior to the concrete pour in order to place the subgrade soils in full expansion.
 1. Provide damming as required to keep standing water within the formed area and to allow for proper saturation and full expansion of the subgrade soils.
 2. Remove standing water before concrete placement.
- D. Construction Joints:
 1. Keep exposed concrete face of construction joints continuously moist from time of initial set until placing of concrete; thoroughly clean contact surface by chipping entire surface not earlier than 5 days after initial pour to expose clean hard aggregate solidly embedded, or by approved method that will assure equal bond, such as green cutting.
 2. If contact surface becomes contaminated with soil, sawdust or other foreign matter, clean entire surface and re-chip entire surface to assure proper adhesion.

3.8 FINISHING

- A. Concrete Paving: Finish surface as required by ACI 302.1R using manual and vibrating screeds to place concrete level and smooth.
 1. Under no circumstances shall water be added to the top surface of freshly placed concrete.
 2. Use "jitterbugs" or other special tools designed for the purpose of forcing the course aggregate below the surface leaving a thick layer of mortar 1 inch in thickness.
 3. After tamping the concrete, wood float surface to a true and even plane.
 4. After floating with a wood bull float, make 2 passes with a steel Fresno trowel to start sealing the concrete surface.

5. While concrete is still wet but sufficiently hardened to bear a persons' weight on knee boards, start troweling with a steel hand trowel or a machine trowel in larger areas. Use sufficient pressure to bring moisture to surface.
 6. After surface moisture has disappeared, finish concrete utilizing steel, hand or power trowel.
 7. Completed surface shall be free from trowel marks, depressions, ridges or other blemishes. Tolerance for flatness shall be 1/8-inch in 10 feet.
 8. Provide final finish as follows, unless otherwise indicated:
 - a. Medium Broom Finish: Typical finish to be used at all exterior walks, stairs and ramps. Brooming direction shall run perpendicular to slope to form non-slip surface.
- B. Curb Finish: Steel trowel.
- C. Joints and Edges:
1. Mark-off exposed joints, where indicated, with 1/4-inch radius x 1 inch deep jointer or edging tool. Joints shall be clean, cut straight and parallel or square with respect to concrete walk edge.
 2. Tool edges of control joints, walk edges, and wherever concrete walk adjoins other material or vertical surfaces. Expansion joints shall be constructed as detailed on plans.
 3. The expansion joints shall be full depth as shown in the Drawings. Failure to do so will result in non-compliance and shall be immediately machine cut by the Contractor at its expense.

3.9 CURING

- A. Formed Concrete:
1. Keep forms and top on concrete between forms continuously wet until removal of forms, 7 days minimum.
 2. Maintain exposed concrete in a continuous wet condition for 14 days following removal of forms.
- B. Concrete Paving, Curb, Curb and Gutter, Valley Gutter:
1. Cure utilizing curing compound. If applicable, the Contractor shall verify that the approved curing compound is compatible with the approved colorant system.
 2. Curing compound shall be applied in a wet puddling application. Spotty applications shall be reason for rejection and possibly concrete removal and replacement at the contractor's expense with no compensation from the Owner.
- C. No curing compound shall be applied to areas scheduled to receive resilient track surface including, curbs, ramps, runways, and similar items.

3.10 DEFECTIVE CONCRETE

- A. General:

1. Determination of defective concrete shall be made by the Architect or Engineer whose opinion shall be final in identifying areas to be replaced, repaired or patched.
2. As directed by Architect, cut out and replace defective concrete.
 - a. Defective concrete shall be removed from the site.
 - b. No patching is to be done until surfaces have been examined by Architect and permission to begin patching has been provided.
 - c. Permission to patch an area shall not be considered waiver of right by the Owner to require removal of defective work, if patching does not, in opinion of Architect, satisfactorily restore quality and appearance of surface.
 - d. Remove and replace concrete if repair to an acceptable condition is not feasible.

B. Defective Concrete Is:

1. Concrete that does not match the approved mix design for the given installation type.
2. Concrete not meeting specified 28-day strength.
3. Concrete which contains rock pockets, voids, spalls, transverse cracks, exposed reinforcing, or other such defects which adversely affect strength, durability or appearance.
4. Concrete which is incorrectly formed, out of alignment or not plumb or level, or outside of the maximum tolerance for flatness and slopes indicated.
5. Concrete containing embedded wood or debris.
6. Concrete having large or excessive patched voids which were not completed under Architect's direction.
7. Concrete not containing required embedded items.
8. Concrete with excessive shrinkage, transverse cracking, crazing, curling; or defective finish.
9. Concrete that is unsuitable for placement or has set in truck drum for longer than 90 minutes from the time it was batched.
10. Concrete where expansion joint filler that is not isolating the full depth of the concrete section, and not recessed as required for backer rod and sealant where required.
11. Concrete that is excessively wet or excessively dry and will not meet the minimum or maximum slump required per mix design.
12. Finished concrete with oil stains from equipment use, and or rust spots that cannot be removed.
13. Concrete with control joints (weakened planed joints) that do not meet the required minimum depth shown on the drawings.
14. Concrete not meeting slip-resistance requirements.

C. Flatwork: The Owner reserves the right to survey the flatwork, to determine if flatwork is outside of the maximum tolerance for flatness and slopes as indicated.

1. If the flatwork is found to be out of tolerance, then the Contractor is required to replace concrete at no additional expense to the Owner.
2. Determination of flatwork flatness, surveying and remedial work must be completed far enough in advance so that the project schedule is maintained, delays are avoided, and the new flatwork or flatwork repairs are properly cured.
3. The Contractor will be responsible for reimbursing the Owner for costs associated with re-surveying to verify compliance of work remediated by the Contractor.

3.11 SEALANT

- A. Apply sealant in compliance with manufacturer's instructions, using hand guns or pressure equipment with proper nozzle size, on clean, dry, properly prepared substrates.
- B. Force sealants into joint against sides of joint to make uniform. Avoid pulling of the sealant from the sides. Fill sealant space completely with sealant.
- C. Finished joints shall be straight, uniform, smooth, and neatly finished.
- D. Remove any excess sealant from adjacent surfaces of joints utilizing the manufacturer's recommended solvent and cleaning processes. Leave the work in a neat, clean condition.

3.12 FIELD QUALITY CONTROL

- A. Inspection of Forms and Reinforcing:
 1. Approval of forms and reinforcing steel must be received from Project Inspector prior to pouring concrete.
 2. Notice of readiness to place first pour shall be given to Project Inspector, DSA, Architect, and Engineer not less than 48 hours prior to placement of concrete to allow for inspection.
 3. Pouring of concrete shall not proceed prior to completing requested adjustments to forms and reinforcing and without approval of Project Inspector.
- B. Testing of Concrete:
 1. Frequency and Samples for Testing:
 - a. Four identical cylinder samples for strength tests of each class of concrete placed each day shall be taken not less than once a day, or not less than once for each 50 cubic yards of concrete, or not less than once for each 2,000 square feet of surface area for slabs or walls.
 - b. In addition, samples for strength tests for each class of concrete shall be taken for seven-day tests at the beginning of the concrete work or whenever the mix or aggregate is changed.
 2. Testing:
 - a. Slump: Each truck's concrete shall be tested for slump before concrete is placed.
 - b. Strength:

- 1) Tests for strength will be conducted by Testing Agency on one cylinder at 7 days and two cylinders at 28 days. The fourth remaining cylinder will be available for testing at 56 days if the 28-day cylinder test results do not meet the required design strength.
 - 2) On a given project, if the total volume of concrete is such that the frequency of specified testing would provide less than five strength tests for a given class of concrete, tests shall be made from at least five randomly selected batches or from each batch if fewer than five batches are used.
- C. Slip-Resistance Testing: Owner's Testing Agency will perform testing on flatwork to verify compliance with specified slip-resistance.
1. The coefficient of friction will be measured by California Test 342 before pavement is opened to public traffic, but not sooner than 7 days after concrete placement
 2. Where paving is determined to have a coefficient of friction less than 0.30, Contractor is to repair and/or replace these surfaces at no cost to Owner.

3.13 CLEANING

- A. Upon completion of work of this Section promptly remove from the working area all scraps, debris and surplus material of this Section.
- B. Clean excess material from surface of all concrete walks and utility structures.
- C. Power wash concrete surfaces to remove stains, dried mud, tire marks, and rust spots.
- D. Comply with any additional requirements of additive manufacturer for colored concrete.

3.14 PROTECTION

- A. Graffiti-resistant Coating:
 1. Surface Preparation: Prepare concrete surface to receive graffiti-resistant coating specified in Section 09 9623, Graffiti-Resistant Coatings, where indicated.
 2. Concrete must be clean, dry, and free of efflorescence and dust.
- B. Protect work and materials of this Section prior to and during installation, and protect the installed work and materials of other trades.
- C. In the event of damage during construction, make all repairs and replacements necessary to the approval of the Architect, at no additional cost to the Owner.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Domestic water piping system.
 - 2. Fire protection piping systems.
 - 3. Sewer piping system

1.2 RELATED REQUIREMENTS

- A. Section 01 5000, Temporary Facilities and Controls.
- B. Section 01 6116, Volatile Organic Compound (VOC) Restrictions, for VOC limits pertaining to adhesives, sealants, fillers, primers, and coatings.
- C. Section 01 8113, Sustainable Design Requirements, for CAL-Green [and Collaborative for High Performance Schools (CHPS)] general requirements and procedures.
- D. Section 31 0000, Earthwork.
- E. Section 31 2333, Trenching and Backfilling.
- F. Section 32 1600, Site Concrete.

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CAL Green), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- C. California Plumbing Code, (CPC), edition as noted on the Drawings.
- D. California State Health and Safety Code Section 116875, Lead Free Public Water Systems.
- E. Local Jurisdiction: Any work within the street, highway or right-of-way shall be performed in accordance with the requirement of the governmental agencies having jurisdiction, and shall not begin until all of those governing authorities have been notified.
- F. ASTM International (ASTM):
 - 1. D422-63: Test Method for Particle Size Analysis of Soil.
 - 2. D698-00: Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures, Using 5.5 lb (2.49 Kg) Rammer and 12 inch (304.8 mm) Drop.

3. D1556-00: Test Method for Density of Soil in Place by the Sand-Cone Method.
4. D1557-02: Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 10 lb. (4.54 Kg) Rammer and 18 inch (457 mm) Drop.
5. D3017-05: Test Methods for Moisture Content of Soils and Soil-Aggregate Mixture by Nuclear Methods (Shallow Depth).
6. D4318-05: Test Method for Liquid Limit, Plastic Limit, and Plasticity Limit.

G. CALTRANS Standard Specifications.

H. CAL-OSHA, Title 8, Section 1590 (e).

I. NFPA 13, 24 and 25, per CFC chapter 80 and CBC chapter 35.

1.4 ADMINISTRATIVE REQUIREMENTS

A. Submittal Procedures:

1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
3. Sustainable Design Submittals shall comply with the additional requirements of Section 01 8113, Sustainable Design Requirements.

1.5 ACTION SUBMITTALS

- A. Provide supplier's descriptive literature for all products to demonstrate compliance with specified attributes.
- B. Substitution: Provide all data of proposed material being submitted as a substitution. Provide comparison with specified product data and identify all differences. Failure to provide comparison will be reason for rejection.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For contractor / installer.
- B. Provide sieve analysis from accredited testing lab on pipe bedding material. Analysis shall have a current date not older than project contract signing date.
- C. Sustainable Design:
1. General:
 - a. Submit information necessary to establish and document compliance with the California Green Building Standards Code.
 - b. Sustainable design submittals are in addition to other submittals.
 2. The following information shall be provided:
 - a. Adhesives and Sealants: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.

- b. Paints and Coatings: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.

1.7 CLOSEOUT SUBMITTALS

- A. Guarantee: Submit subcontractor's guarantee.
- B. Water Sterilization Test Report.

1.8 QUALITY ASSURANCE

- A. Contractor / Installer shall have been in business for five (5) years providing/finishing similar size projects and complexity.
- B. Contractor shall be solely responsible for all subgrades built. Any repairs resulting from inadequate compaction or incorrect grades will be the responsibility of the contractor.
- C. The representatives of the Owner's testing lab will not act as supervisor of construction, nor will they direct construction operations. Neither the presence of the Owner's testing lab representatives nor the testing by the Owner's testing lab shall excuse the contractors or subcontractors for defects or deficiencies discovered in their work during or following completion of the project. Correcting inadequate compaction is the sole responsibility of the contractor.
- D. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the drawings to be salvaged and re-used.
 - 1. Sun damaged or discolored PVC pipe will be rejected.
- E. All materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.

1.9 FEES, PERMITS, AND UTILITY SERVICES

- A. Obtain and pay for permits and service charges required for installation of Work. Arrange for required inspections and secure written approvals from authorities having jurisdiction.
- B. Upon completion of work within right-of-way, provide copies of written final approval to the Architect.

1.10 DELIVERY, STORAGE AND HANDLING

- A. Transport, store and handle in strict accord with the local jurisdiction and manufacturer's written recommendations
- B. Deliver undamaged products to job in manufacturer's sealed containers and/or original bundles with tags and labels intact.

1.11 EXISTING SITE CONDITIONS

- A. Contractor shall acquaint himself with all site conditions. If unknown active utilities are encountered during work, notify Architect promptly for instructions. Failure to notify will make Contractor liable for damage to these utilities arising from Contractor's operations subsequent to discovery of such unknown active utilities.
- B. Existing civil, mechanical and electrical improvements are shown on respective site plans to the extent known. Should the Contractor encounter any deviation between actual conditions and those shown, he is to immediately notify the Architect before continuing work.

1.12 PROTECTION

- A. Adequate protection measures shall be provided to protect workmen and passers-by on and off the site. Adjacent property shall be fully protected throughout the operations. Blasting will not be permitted. Prevent damage to adjoining improvements and properties both above and below grade. Restore such improvements to original condition should damage occur. Replace trees and shrubs outside building area disturbed by operations.
- B. In accordance with generally accepted construction practices, the Contractor shall be solely and completely responsible for working conditions at the job site, including safety of all persons and property during performance of the work. This requirement shall apply continuously and shall not be limited to normal working hours.
- C. Any construction review of the Contractor's performance conducted by the Geotechnical Engineer is not intended to include review of the adequacy of the Contractor's safety measures, in, on, or near the construction site.
- D. Provide shoring, sheeting, sheet piles and or bracing to prevent caving, erosion or gulying of sides of excavation.
- E. Surface Drainage: Provide for surface drainage during period of construction in manner to avoid creating nuisance to adjacent areas. The contractor shall make a reasonable effort on a daily basis to provide pumps and all equipment necessary to keep all excavations and the site free from water during entire progress of work, regardless of cause, source, or nature of water.
- F. Adjacent streets and sidewalks shall be kept free of mud, dirt or similar nuisances resulting from earthwork operations.
- G. The site and adjacent influenced areas shall be watered as required to suppress dust nuisance. Dust control measures shall be in accordance with the local jurisdiction.
- H. Trees: Carefully protect existing trees that are to remain. Provide temporary irrigation as necessary to maintain health of trees.

1.13 SEASONAL LIMITS

- A. No fill material shall be placed, spread or rolled during unfavorable weather conditions. When work is interrupted by rains, fill operations shall not be resumed until field tests indicate that moisture content and density of fill are satisfactory.

1.14 RECORD DRAWINGS

- A. Keep a daily record of all pipe placed in ground, verified by Project Inspector.
- B. Upon completion of this Contract, furnish one tracing showing all outside utility lines, piping, etc., installed under this Contract. Locate and dimension all work with reference to permanent landmarks.
- C. All symbols and designations used in preparing "RECORD" drawings shall match those used in Contract drawings.
- D. Properly identify on as-builts and provide dimensions for all stubs for future connections. Provide concrete markers 6" dia. 12" deep, flush with finish grade at the ends of all stubbed pipes.
- E. Provide record drawings per Section 01 3300.

PART 2 - PRODUCTS

2.1 DESIGN AND PERFORMANCE CRITERIA

- A. Sustainable Design:
 - 1. VOC emissions for field-applied adhesives, sealants, and sealant primers must comply with limits specified in Section 01 6116.
 - 2. VOC emissions for field-applied paints and coatings must comply with limits specified in Section 01 6116.

2.2 MATERIALS - GENERAL

- A. Provide each item listed herein or shown on drawings of quality noted or approved equal. All material shall be new, full weight, standard in all respects and in first-class condition. Insofar as possible, all materials used shall be of same brand or manufacture throughout for each class of material or equipment. Materials shall be of domestic manufacture and shall be tested within Continental United States.
- B. Grade or quality of materials desired is indicated by trade names or catalog numbers stated herein.
- C. Dimensions, sizes, and capacities shown are minimum and shall not be changed without permission of Architect.
- D. All materials in this section used for any public water system or domestic water for human consumption shall be lead free.

1. For the purposes of this section, "lead free" means not more than 0.2 percent lead when used with respect to solder and flux and not more than 8 percent when used with respect to pipes and pipe fittings.
2. All pipe, pipe or plumbing fitting or fixtures, solder, or flux shall be certified by an independent American National Standards Institute (ANSI) accredited third party, including, but not limited to, NSF International, as being in compliance with this section.

E. All materials used for fire system piping shall be UL and FM approved.

2.3 VALVE BOXES

- A. Provide at each valve or cock in ground a Christy, Brooks, or equal to Christy G05CT, concrete valve box with cover marked for service, domestic water shall be marked "Water" and fire supply shall be marked "Fire". Furnish extension handles for each size square nut valve, and provide "fork" handle for each size of "wheel handle" valve as required. Do not locate valve boxes in walk, or covered passages, curbs, or curb & gutters, unless necessary. If valve location is within concrete or asphalt paved surface valve box shall be as detailed on plans for such condition. Provide valve box extensions as required to set bottom of valve box to bottom of piping in which valve is installed. Provide Owner with set of special wrenches and/or tools as required for operation of valves.

2.4 PIPES AND FITTINGS

- A. Sanitary Sewer: PVC sewer pipe and fittings with Ring-Tite joints, ASTM D3034 SDR35.
- B. Domestic water Lines 3 1/2" and smaller: Type K copper tubing, hard temper, with wrought copper fittings. Schedule 80 PVC, ASTM D 1784, ASTM D 1785.
- C. Water lines 4" and larger: AWWA C-900 Class 150/DR18 with rubber gasket joints.
- D. Fire lines 4" and larger: AWWA C-900 Class 200/DR14 with rubber gasket joints.
- E. Solder: Lead Free. 95/5; 95% Tin / 5% Antimony.
- F. Ductile Iron Pipe; AWWA Class 51, Cement Lined
- G. Ductile Iron Pipe Fittings; AWWA C110, C153, Ebba Iron, Star Romac, Sigma, or approved equal.
- H. PVC Mechanical Fittings; Ebba Iron, Star; Romac; Sigma or approved equal.
- I. Ductile Iron Pipe/PVC C-900 Pipe Restrained Fittings; Ebba Iron # 3800 Mega Coupling, Ebba Iron 1100CH Split Restrained Harness for pipe couplings. StarGrip Series 4000.
- J. Ductile Iron Pipe/PVC C900, C905 Restrained Degreedand Blind Cap Fittings,;
- K. Mega Lug; Sigma; Romac; or an approved equal

- L. Mechanical Fitting Bolts; Bolts and nuts shall be carbon steel with a minimum 60,000 psi tensile strength conforming to ASTM A 307, Grade A. Bolts shall be standard ANSI B1.1 Class 2A course threads. Nuts shall conform to ASTM A 563 and be standard ANSI B1.1, Class 2A course thread. All bolts and nuts shall be zinc coated.
- M. Fasteners Anti-Rust Coatings; After assembly, coat all fasteners with an Asphaltic Bituminous coatings conforming to latest edition NFPA 24.
- N. Ductile Iron Pipe Wrap; 8 mil polyethylene pipe wrap conforming to ANSI/AWWA C105/A21.5 standards.
- O. Pipe Insulation; Pipe exposed to atmospheric conditions ½" thru 4" NPT; Johns Manville rigid fiberglass insulation, Micro Lok HP; Owens Corning Fiberglas SSL II; Conforming to ASTM C 612, Type 1A or type 1B.
- P. Aluminum field applied pipe insulation jacket; comply with ASTM B209, ASTM C1729, ASTM C1371 Manufacturers; Childers Metals; ITW Insulation Systems Aluminum Jacketing; or an approved equal.
 - 1. Finish shall be flat mill finish
 - 2. Factory Fabricated Fitting Covers; 45 and 90 degree elbows, tee's, valve covers, end caps, unions, shall be of the same thickness and finish of jacket.
 - 3. The fittings shall be composed of 2-pieces
 - 4. Adhesives; per the manufacturers requirements
 - 5. Joint Sealant; shall be silicone, and shall be aluminum in color.
- Q. Sewer Forced Main; HDPE, DR 11, color gray with green stripe by JM Eagle or approved equal.

2.5 SANITARY SEWER MANHOLES

- A. Shall be constructed as shown on plan details.

2.6 CLEANOUTS

- A. Cleanouts of same diameter as pipe up to 8" in size shall be installed in all horizontal soil and waste lines where indicated and at all points of change in direction. Cleanouts shall be located not less than 18" from building so as to provide sufficient space for rodding. No horizontal run over 100 feet shall be without cleanout whether shown on drawings or not.
- B. All cleanout boxes shall be traffic rated with labeled lid, Christy G05CT or approved equal. Lid shall be vandal proof with stainless steel screws

2.7 UNIONS

- A. Furnish and install one union at each threaded or soldered connection to equipment and 2 unions, one on each side of valves on pipes ½" to 3".

- B. Locate unions so that piping can be easily disconnected for removal of equipment or valve. Provide type specified in following schedule:

Type of Pipe Union

Steel Pipe: 150 lb. Screwed malleable ground joint, brass, brass-to-iron seat, black or galvanized to match pipe.

Copper tubing: Brass ground joint with sweat connections.

PVC Sch 80 pipe: PVC union, FIPT X FIPT

2.8 VALVES

- A. Provide valves as shown and other valves necessary to segregate branches or units. Furnish valves suitable for service intended. Valves shall be properly packed and lubricated. Valves shall be non-rising stem. Place unions adjacent to each threaded or sweat fitting valve. Install valves with bonnets vertical. All valves shall be lead free.
- B. Valves ½" thru 2"; shall be made of bronze, full size of pipe and lead free. Nibco S-113-FL Series; American G-300 Series; Matco 511 FL Series; Apollo 102T-FL Series. Brass valves of brass parts within valves will not be accepted.
- C. Valves, 2 ½" thru 3" shall be class 150; Shall be made of bronze, full size of pipe; Jenkins Fig. 2310 J; Lunkinheimer Fig. 2153; Crane Fig. 437; Stockham Fig. B-128.
- D. Valves, Flanged; 4" thru 12" Ductile Iron Resilient Wedge Gate Valve; Nibco F 609 RW; American 2500 Series; Kennedy 8561; Mueller 2360 Series.

2.9 TAPPING SLEEVE

- A. Shall be used on pipe sizes 6" thru 12" and shall be made with stainless steel material including stainless steel bolts. Flanges shall be ductile iron or high carbon steel. Gaskets shall seal full circumference of pipe. Shall be manufactured for operating pressure of 200 psi, and shall pass test pressure of 300 psi. Romac SST series; Smithblair 662; Mueller H304; Ford "FAST" tapping sleeve.

2.10 SERVICE SADDLES

- A. Shall be used on pipe size 2" thru 4". Body shall be made from ductile iron with epoxy coating or bronze. Cascade Style CSC-1; A.Y. McDonald model 3891 AWWA/3892 FNPT; Smith-Blair #317; Ford S70, S71, S90, (style B).

2.11 TRACER WIRE

- A. No. 10 THW solid copper wire. Solder all joints

PART 3 - EXECUTION

3.1 DRAWINGS AND COORDINATION

- A. General arrangement and location of piping, etc., are shown on Drawings or herein specified. Install work in accord therewith, except for minor changes that may be necessary on account of other work or existing conditions. Before excavation, carefully examine other work that may conflict with this work. Install this work in harmony with other craft and at proper time to avoid delay of work.
- B. Verify invert elevations at points of connection to existing systems prior to any excavation. If invert elevations differ from that shown on drawings, notify Architect immediately.
- C. In advance of construction, work out minor changes if conflicts occur with electrical or mechanical. Relocate services to suit actual conditions and work of other trades to avoid conflict therewith. Any adjustments or additional fittings to make adjustments shall not be cause for additional costs to the owner.
- D. Execute any work or apparatus shown on drawings and not mentioned in specifications, or vice versa. Omission from Drawings or Specifications of any minor details of construction, installation, materials, or essential specialties does not relieve Contractor of furnishing same in place complete.
- E. Graded pipes shall take precedence. If conflict should occur while placing the domestic water and fire service piping, the contractor shall provide any and all fittings necessary to route the water lines over such conflicting pipes at no additional costs to the owner.

3.2 ACCESS

- A. Continuously check for clearance and accessibility of equipment or materials specified herein to be placed. No allowance of any kind shall be made for negligence on part of Contractor to foresee means of installing his equipment or materials into proper position.

3.3 EXCAVATING AND BACKFILLING

- A. Excavation and Bedding:
 - 1. General: Trench straight and true to line and grade with bottom smooth and free of irregularities or rock points. Trench width to be a minimum of 12" wider than outside diameter of pipe. Follow manufacturer's recommendations for use of each kind and type of pipe.
 - 2. Bedding: Provide a bedding as noted on drawing details for the full length of the pipe. Bedding shall have a minimum thickness beneath the pipe of 4" or 1/8 the outside diameter of the pipe, which ever is greater. Provide bell holes and depressions for pipe joints only of size required to properly make joint.
 - 3. If the trenches for the site utilities falls within areas to be lime treated, the piping shall be installed prior to any lime treatment operations, providing the elevation of the piping is below the treatment section.

UTILITIES
SECTION 33 0000
3595001

- a. If trenching is necessary in areas that have been previously lime treated the contractor shall backfill the trench with class 2 aggregate base, with minimum section equal to the lime treated section and compacted to 95%.

B. Laying of Pipe:

- 1. General: Inspect pipe prior to placing. Sun damaged pipe will be rejected. Set aside any defective or damaged material. Do not place pipe in water nor place pipe when trenches or weather are unsuitable. Lay pipe bell up grade, true to line and grade.
 - a. Sewer pipe shall be laid in strict conformity to the prescribed line and grade, with grade bars set and each pipe length checked to the grade line. Three consecutive points on the same rate of slope shall be used at all times to detect any variation from a straight grade. In any case of discrepancy, work shall be stopped and the discrepancy immediately reported to the Owner's Representatives. In addition, when requested by the Owner's Representative, a string line shall be used in the bottom of the trench to insure a straight alignment of the sewer pipe between manholes. The maximum deviation from grade shall not be in excess of 1/4 inch. In returning the pipe to grade, no more than 1/4" depression shall result.
 - b. The Contractor shall expose the end of existing pipe to be extended, for verification of alignment and elevation, prior to trenching for any pipe which may be affected. All costs of such excavation and backfill shall be included in the price paid for the various items of work.
 - c. A temporary plug, mechanical type shall be installed on sewer pipe at the point of connection to existing facilities. If connecting to a public facility the plug shall conform to the requirements of the local jurisdiction. This plug shall remain in place until the completion of the balling and flushing operation.
- 2. Bell and Spigot Joints: Lubricate inside of bells and outside of spigots with soap solution. Wedge joints tight. Bell of bell and spigot pipe to be pointed up grade.

C. Backfilling:

- 1. General: Do not start backfill operations until required testing has been accomplished.
- 2. Compaction and Grading: Remainder of backfill shall be in accordance with Section 31 2333 – TRENCHING AND BACKFILLING.
- 3. If trenching in area previously lime or cement treated backfill top of trench section, same depth as lime or cement treatment with Class 2 Aggregate Base compacted to 95% minimum relative compaction.

3.4 INSTALLATION OF WATER PIPING

- A. Immediately cap or plug ends of, and opening in, pipe and fittings to exclude dirt until final connections made. Use reducing fittings where any change in pipe size occurs. Bushings shall not be used.

- B. General: Should existing conditions or other work prevent the running of pipes or the setting of equipment at the points indicated by drawings, changes as authorized by the Architect shall be made without additional cost to the Owner.
- C. All bolts used on mechanical fittings shall be thoroughly coated with an asphaltic bituminous coating conforming to 2007 NFPA (National Fire Protection Association) 10.3.5.2 and 10.8.3.5, CBC chapter 35 and CFC chapter 80.
- D. All buried metal shall be incased with 8 mil polyethylene wrap so that no soil is in contact with metal. Ends of polyethylene wrap shall be taped to provide seal with pipe.
- E. Do not install water lines in same trench with non-metallic sewer lines unless bottom of water pipe at all points is at least 12" above top of sewer line and water line is placed on solid shelf excavated at one side of common trench with a minimum of 12 inch horizontal separation.
- F. Under no circumstance shall a fitting be located directly under a structural footing without prior approval from the Architect.
- G. In locations where existing domestic pipe is rerouted, the new pipe shall be assembled using restrained fittings at all joints including factory pipe joints. Tapped restrained blind flanges shall be temporarily installed at each end of the assembled pipes until testing and chlorination is completed and approved.

3.5 CLOSING IN OF UNINSPECTED WORK

- A. Do not allow or cause work installed to be covered up or enclosed before it has been inspected, tested, and approved. Should work be enclosed or covered up before it has been approved, uncover work at own expense. After it has been inspected, tested and approved, make repairs necessary to restore work of other contractors to condition in which it was found at time of cutting.

3.6 CARE AND CLEANING

- A. Repair or replace broken, damaged, or otherwise defective parts, materials, and work. Leave entire work in new condition satisfactory to Architect. At completion, carefully clean and adjust equipment, fixtures and trim that are installed as part of this work. Leave systems and equipment in satisfactory new operating condition.
- B. Drain and flush piping to remove grease and foreign matter.
- C. Sewer piping shall be balled and flushed.
- D. Clean out and remove surplus materials and debris resulting from the work, including surplus excavated material.
- E. Flush fire service piping in the presence of the project inspector. Flushing shall be continued for a sufficient time as necessary to ensure all foreign material has been removed. Flow rate shall be equal to site fire flow requirements.

3.7 SEWER INTERNAL INSPECTIONS

- A. Upon completion of construction and prior to final inspection, the Contractor shall clean the entire new pipeline of all dirt and debris. Any dirt or debris in previously existing pipes or ditches in the area, which resulted from the new installation, shall also be removed. Pipes shall be cleaned by the controlled balling and flushing method. Temporary plugs shall be installed and maintained during cleaning operations at points of connection to existing facilities to prevent water, dirt, and debris from entering the existing facility.

3.8 TEST OF PIPING

- A. Pressure Test piping at completion of roughing-in, in accord with following schedule, and show no loss in pressure or visible leaks after minimum duration or four (4) hours at test pressures indicated.
- B. Chlorination tests shall be performed after all fixtures and any required mechanical devices are installed and the entire system is complete and closed up.
- C. In cases where new domestic water piping is assembled for re-routing of existing domestic water pipe, the contractor shall perform the following testing prior to connecting the new water pipe to the existing system.
 - 1. The pipe shall be pressure tested and per the test schedule.
 - 2. The pipe shall be pressure tested down within the trench.
 - 3. The contractor shall dig a temporary ditch below the existing pipe to drain to a sump that is lower than the bottom of the trench and to the side of the trench. The sump shall be 30% larger than the total volume of water within the testing pipe assembly.
 - 4. After pressure testing and chlorination has taken place and accepted, the contractor shall drain the pipe into the sump and pump the sump out as it is filling.
 - 5. The temporary test fittings at each end of the pipe assembly shall be removed and the final restrained couplings installed.
 - 6. The existing piping shall be cut and the water within the pipe shall drain below the pipe to the temporary sump. Pump the sump as it is being filled up. Take extreme caution not to contaminate the existing pipe with any contaminants within the trench.
 - 7. Before making the final coupling connections, the restrained couplings at each end of the new pipe shall be thoroughly swabbed inside the fitting with a solution of chlorine mixed with water at a rate of 1 part chlorine to 4 parts potable water.
 - 8. After final connections are made, a visual inspection shall be made after fittings are wiped off. If after 1 hr, no noticeable drips are noted the pipe can be backfilled.
 - 9. The contractor shall flush all water piping affected by chlorination until it is within acceptable levels approved by certified testing lab.

TEST SCHEDULE

<u>System Tested</u>	<u>Test Pressure PSIG Test With</u>
Public Water Mains	Per local jurisdiction requirements.
Private Domestic Water Piping:	150 Lbs. Water 4 hrs.
Fire Protection Piping:	200 Lbs. Water pressure, 4 hrs duration with no pressure loss.
Sanitary Sewer Piping:	Sewer system shall be tested for leakage per local jurisdiction requirements.

- D. Testing equipment, materials, and labor shall be furnished by contractor.

3.9 WATER SYSTEM STERILIZATION

- A. Public Water Mains: Shall be flushed and disinfected per the local jurisdiction requirements
- B. Clean and disinfect all site water systems connected to the domestic water systems in accordance with AWWA Standard C651 and as required by the local Building and Health Department Codes, and EPA.
 - 1. Clean and disinfect industrial water system in addition to the domestic water system.
 - 2. Disinfect existing piping systems as required to provide continuous disinfection upstream to existing valves. At Contractors option, valves may be provided to isolate the existing piping system from the new piping system.
- C. Domestic water sterilization shall be performed by a licensed "qualified applicator" as required by CAL-EPA Pesticide Enforcement Branch for disinfecting and sterilizing drinking water.
- D. Disinfecting Agent: Chlorine product that is a registered product with Cal-EPA for use in California potable water lines, such as Bacticide, CAL-EPA Registration No. 37982-20001.
- E. Contractor to provide a 1" service valve connected to the system at a point within 2'-0" of its junction with the water supply line. After sterilization is complete Contractor to provide cap at valve.
- F. Sterilization Procedure to be as follows:
 - 1. Flush pipe system by opening all outlets and letting water flow through the system until clear water flows from all outlets.

UTILITIES
SECTION 33 0000
3595001

2. Inject disinfecting agent to provide a minimum chlorine residual concentration of at least 50 parts per million (ppm) of free chlorine at each outlet.
 3. Provide sign at all outlets which reads "Water Sterilization in Progress – Do not operate". Remove signs at conclusion of test.
 4. Close all outlets and valves, including valve connecting to water supply line and 1" service valve. Retain treated water in pipe for a minimum of twenty-four hours. Should chlorine residual at pipe extremities be less than 50 PPM at this time, pipe shall be re-chlorinated. As an option, the water systems may be filled with a water-chlorine solution containing a minimum of 200 PPM of chlorine and allowed to stand for three hours.
 5. After chlorination, flush lines of chlorinated water and refill from domestic supply. Continue flushing until residual chlorine is less than or equal to 0.2 ppm, or a residual the same as that of the test water.
- G. Chemical and bacteriological tests shall be conducted by a state-certified laboratory and approved by the local authorities having jurisdiction.
- H. Submit written report to Health Department as required by State Regulations. Provide a copy of report to Architect prior to completion of project.
- I. The costs of sterilization and laboratory testing shall be paid for by the contractor.

3.10 CLEANING

- A. Upon completion of work of this Section promptly remove from the working area all scraps, debris and surplus material of this Section.

END OF SECTION

s:\master specifications\division 33 - utilities\33 0000_utilities.docx
Formatting Updated: 9-13-21

PART 1 - GENERAL

1.1 SUMMARY

- A. Summary Includes:
 - 1. Storm drainage piping systems.

1.2 RELATED REQUIREMENTS

- A. Section 01 5000, Construction Facilities and Controls.
- B. Section 01 6116, Volatile Organic Compound (VOC) Restrictions, for VOC limits pertaining to adhesives, sealants, fillers, primers, and coatings.
- C. Section 01 8113, Sustainable Design Requirements, for CAL-Green **[and Collaborative for High Performance Schools (CHPS)]** general requirements and procedures.
- D. Section 31 0000, Earthwork.
- E. Section 31 2333, Trenching and Backfilling.
- F. Section 32 1200, Asphalt Concrete Paving.
- G. Section 32 1600, Site Concrete

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CAL Green), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- C. California Plumbing Code, (CPC), edition as noted on the Drawings.
- D. Local Jurisdiction: Any work within the street, highway or right-of-way shall be performed in accordance with the requirement of the governmental agencies having jurisdiction, and shall not begin until all of those governing authorities have been notified.
- E. ASTM International (ASTM):
 - 1. D 422-63 Test Method for Particle Size Analysis of Soil.
 - 2. D698-00 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures, Using 5.5 lb (2.49 Kg) Rammer and 12 inch (304.8 mm) Drop.
 - 3. D1556-00 - Test Method for Density of Soil in Place by the Sand-Cone Method.
 - 4. D1557-02 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 10 lb. (4.54 Kg) Rammer and 18 inch (457 mm) Drop.

STORM DRAINAGE UTILITIES
SECTION 33 4000
3595001

5. D 3017-05 Test Methods for Moisture Content of Soils and Soil-Aggregate Mixture by Nuclear Methods (Shallow Depth).
6. D 4318-05 Test Method for Liquid Limit, Plastic Limit, and Plasticity Limit.

F. CALTRANS Standard Specifications.

G. CAL-OSHA, Title 8, Section 1590 (e).

1.4 ADMINISTRATIVE REQUIREMENTS

A. Submittal Procedures:

1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
3. Sustainable Design Submittals shall comply with the additional requirements of Section 01 8113, Sustainable Design Requirements.

1.5 ACTION SUBMITTALS

- A. Provide supplier's descriptive literature for all products to demonstrate compliance with specified attributes.
- B. Substitution: Provide all data of proposed material being submitted as a substitution. Provide comparison with specified product data and identify all differences. Failure to provide comparison will be reason for rejection.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: Contractor / installer.
- B. Provide sieve analysis from accredited testing lab on pipe bedding material. Analysis shall have a current date not older than project contract signing date.
- C. Sustainable Design:
1. General:
 - a. Submit information necessary to establish and document compliance with the California Green Building Standards Code.
 - b. Sustainable design submittals are in addition to other submittals.
 2. The following information shall be provided:
 - a. Adhesives and Sealants: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.
 - b. Paints and Coatings: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.

1.7 CLOSEOUT SUBMITTALS

- A. Guarantee: Submit subcontractor's guarantee.

1.8 QUALITY ASSURANCE

- A. Contractor / Installer shall have been in business for five (5) years providing/finishing similar size projects and complexity.
- B. Contractor shall be solely responsible for all subgrades built. Any repairs resulting from inadequate compaction are the responsibility of the contractor.
- C. The representatives of the Owner's testing lab will not act as supervisor of construction, nor will they direct construction operations. Neither the presence of the Owner's testing lab representatives nor the testing by the Owner's testing lab shall excuse the contractors or subcontractors for defects discovered in their work during or following completion of the project. Correcting inadequate compaction is the sole responsibility of the contractor.
- D. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.
 - 1. Sun damaged or discolored PVC pipe will be rejected.
- E. All materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.

1.9 DELIVERY, STORAGE AND HANDLING

- A. Transport, store and handle in strict accord with the local jurisdiction and manufacturer's written recommendations
- B. Deliver undamaged products to job in manufacturer's sealed containers and/or original bundles with tags and labels intact.

1.10 EXISTING SITE CONDITIONS

- A. Contractor shall acquaint himself with all site conditions. If unknown active utilities are encountered during work, notify Architect promptly for instructions. Failure to notify will make Contractor liable for damage to these utilities arising from Contractor's operations subsequent to discovery of such unknown active utilities.
- B. Existing civil, mechanical and electrical improvements are shown on respective site plans to the extent known. Should the Contractor encounter any deviation between actual conditions and those shown, he is to immediately notify the Architect before continuing work.

1.11 PROTECTION

- A. Adequate protection measures shall be provided to protect workmen and passers-by on and off the site. Adjacent property shall be fully protected throughout the operations.

STORM DRAINAGE UTILITIES
SECTION 33 4000
3595001

Blasting will not be permitted. Prevent damage to adjoining improvements and properties both above and below grade. Restore such improvements to original condition should damage occur. Replace trees and shrubs outside building area disturbed by operations.

- B. In accordance with generally accepted construction practices, the Contractor shall be solely and completely responsible for working conditions at the job site, including safety of all persons and property during performance of the work. This requirement shall apply continuously and shall not be limited to normal working hours.
- C. Any construction review of the Contractor's performance conducted by the Geotechnical Engineer is not intended to include review of the adequacy of the Contractor's safety measures, in, on, or near the construction site.
- D. Provide shoring, sheeting, sheet piles and/or bracing to prevent caving, erosion or gullyng of sides of excavation.
- E. Surface Drainage: Provide for surface drainage during period of construction in manner to avoid creating nuisance to adjacent areas. The contractor shall make a reasonable effort on a daily basis to provide pumps and all equipment necessary to keep all excavations and the site free from water during entire progress of work, regardless of cause, source, or nature of water.
- F. Adjacent streets and sidewalks shall be kept free of mud, dirt or similar nuisances resulting from earthwork operations.
- G. The site and adjacent influenced areas shall be watered as required to suppress dust nuisance. Dust control measures shall be in accordance with the local jurisdiction.
- H. Trees: Carefully protect existing trees that are to remain.

1.12 SEASONAL LIMITS

- A. No fill material shall be placed, spread or rolled during unfavorable weather conditions. When work is interrupted by rains, fill operations shall not be resumed until field tests indicate that moisture content and density of fill are satisfactory.

1.13 TESTING

- A. General: Refer to Section 01 4523 – Testing and Inspection Services, and Structural Tests and Inspections List, DSA-103.
- B. Geotechnical Engineer: Owner is retaining a Geotechnical Engineer to determine compliance of fill with Specifications, and to direct adjustments in fill operations. Costs of Geotechnical Engineer will be borne by Owner; except those costs incurred for re-tests or re-inspection will be paid by Owner and backcharged to Contractor.

1.14 RECORD DRAWINGS

- A. Keep a daily record of all pipe placed in ground, verified by Project Inspector.

STORM DRAINAGE UTILITIES
SECTION 33 4000
3595001

- B. Upon completion of this Contract, furnish one tracing showing all outside utility lines, piping, etc., installed under this Contract. Locate and dimension all work with reference to permanent landmarks.
- C. All symbols and designations used in preparing "RECORD" drawings shall match those used in Contract drawings.
- D. Properly identify all stubs for future connections, as to location and use, by setting of concrete marker at finished grade in the manner suitable to Architect.

PART 2 - PRODUCTS

2.1 DESIGN AND PERFORMANCE CRITERIA

- A. Sustainable Design:
 - 1. VOC emissions for field-applied adhesives, sealants, and sealant primers must comply with limits specified in Section 01 6116.
 - 2. VOC emissions for field-applied paints and coatings must comply with limits specified in Section 01 6116.

2.2 MATERIALS

- A. Pipe: Use one of the following, unless noted on the Drawings otherwise.
 - 1. Polyvinyl Chloride Pipe (PVC): SDR35 conforming to ASTM D3034 with elastomeric joints conforming to ASTM D3212 for pipe to 12". Sun damaged pipe will be rejected.
 - 2. High density polyethylene pipe (HDPE): The pipe shall be corrugated exterior/smooth interior pipe. 12" to 60" maximum diameter shall conform to AASHTO M294, water tight per ASTM D3212 with water tight gasket fittings.
- B. Perforated Pipe (for subdrains): Shall be ADS N12 pipe, 3 hole, ASTM F 405, AASHTO M 252; PCV ASTM D3034 SDR-35 storm drain pipe
- C. Manhole: Shall be as shown on the drawing details.
- D. Drop Inlet: Shall be as shown on the drawing details.
- E. Curb Inlet: Shall be as shown on the drawing details.
- F. Mortar: For pipe connections to concrete drainage structures, conform to ASTM C270 type N mortar. Place within one half hour after adding water.
- G. Crushed Rock: Imported washed crushed rock. Minimum 100% passing 3/4 inch sieve.
- H. Trench drain: Polycast, Polydrain or equal and as shown on drawings.
- I. Area Drains: Shall be as shown on the drawing details.

STORM DRAINAGE UTILITIES
SECTION 33 4000
3595001

- J. Floor Drains: Shall be as shown on the drawing details.
- K. Clean-outs: Shall be as shown on the drawing details.
- L. Planter drains: Shall be as detailed on the drawing details.
- M. Filter Fabric: Mirafi 140N.

PART 3 - EXECUTION

3.1 INSPECTION LAYOUT AND PREPARATION

- A. Prior to installation of the work of this Section, carefully inspect and verify by field measurements that installed work of all other trades is complete to the point where this installation may properly commence
- B. Layout all work, establish grades, locate existing underground utilities, set markers and stakes, setup and maintain barricades and protection facilities; all prior to beginning actual earthwork operations. Layout and staking shall be done by a licensed Land Surveyor or Professional Civil Engineer.
- C. Verify that specified items may be installed in accordance with the approved design.
- D. In event of discrepancy, immediately notify Owner and the Architect. Do not proceed in discrepant areas until discrepancies have been fully resolved.

3.2 EXCAVATION AND BACKFILLING

- A. General: Installation shall be in strict conformance with referenced standards, the manufacturer's written directions, as shown on the drawings and as herein specified.
- B. Verify invert elevations at points of connection to existing systems prior to any excavation. If invert elevations differ from that shown on drawings, notify Architect immediately.
- C. Excavation and Bedding:
 - 1. General: Trench straight and true to line and grade with bottom smooth and free of irregularities or rock points. Trench width in accordance with pipe manufacturer's recommendations and as per the drawings. Follow manufacturer's recommendations for use of each kind and type of pipe.
 - 2. Bedding: Provide bedding as detailed on plans for the full length of the pipe. Bedding shall have a minimum thickness beneath the pipe of 4" or 1/8 the outside diameter of the pipe, whichever is greater. Provide bell holes and depressions for pipe joints only of size required to properly make joint.
 - 3. If the trenches for the site drainage fall within areas to be lime treated, the piping shall be installed prior to any lime treatment operations.
 - a. If additional piping is added to previously lime treated areas, the contractor shall backfill the trench with class 2 aggregate base and compact to 95%.

D. Laying of Pipe:

1. General: Inspect pipe prior to placing. Set aside any defective or damaged material. Do not place pipe in water nor place pipe when trenches or weather are unsuitable. Lay pipe upgrade, true to line and grade.
2. Bell and Spigot Joints: Lubricate inside of bells and outside of spigots with soap solution or as recommended by manufacture. Wedge joints tight. Bell of bell and spigot pipe to be pointed upgrade.
3. Pipe shall be bedded uniformly throughout its length.
4. Pipe elevation shall be within 0.02 feet of design elevation as shown on plans.
5. Off Site Work: All work beyond the property lines shall be done in strict conformance with the requirements of the governing agency.

E. Backfilling:

1. General: Do not start backfill operations until required testing has been accomplished.
2. Trenches and Excavations: Backfill with material as detailed on plans, filling both sides of the pipe at the same time, carefully tamping to hold pipe in place without movement. Refer to Section 31 2333 – TRENCHING AND BACKFILLING for fill above this layer.

F. Grouting of Pipes: Grout pipes smooth and water tight at drop inlet, manholes, and curb inlets. Grout back side of hood at curb inlets all grouting shall be smooth and consistent.

G. Off Site Work: All work beyond the property lines shall be done in strict conformance with the requirements of the local agency.

H. Cutting and Patching: Remove and replace existing surface features per applicable specification section (i.e. asphaltic concrete or concrete paving) where pipe is installed in areas of existing improvements.

3.3 TOLERANCES

A. Storm Drain structure grates

1. In landscape and lawn areas $\pm 0.05'$.
2. In sidewalk and asphalt pavement $\pm 0.025'$.
3. In curb and gutter application $\pm 0.0125'$.

B. Cleanout Boxes and Lids

1. In landscape areas; 0.10 higher than surrounding finish grade, $\pm 0.05'$.
2. In sidewalks and asphalt pavement; Flush with surrounding finish grade, $\pm 0.025'$.

3.4 DEWATERING

A. Contractor to provide trench dewatering as necessary, no matter what the source is, at no additional cost to the owner.

STORM DRAINAGE UTILITIES
SECTION 33 4000
3595001

3.5 FLUSHING

- A. The Contractor shall thoroughly ball and flush the storm drain system to remove all dirt and debris. Discharge water to an approved location.

3.6 CLEANING

- A. Upon completion of work of this Section promptly remove from the working area all scraps, debris and surplus material of this Section.
- B. Clean the dirt, rocks, and debris from the drop inlets and storm drain manholes.

END OF SECTION

**Villalovoz Elementary School -
Shade Structures**

1550 Cypress Dr., Tracy, CA 95376

3595001

Tracy Unified School District
1875 W Lowell Ave., Tracy, CA 95376

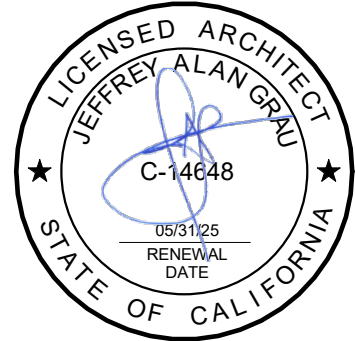


May 16, 2024

Villalovoz Elementary School - Shade Structures
Tracy Unified School District
Tracy, California

May 16, 2024

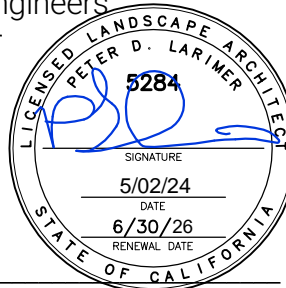
HMC # 3595001



HMC ARCHITECTS
Architect



Warren Consulting Engineers
Civil Engineer



MTW Group
Landscape Architect

TABLE OF CONTENTS

DIVISION 00 - PROCUREMENT AND CONTRACTING REQUIREMENTS - NOT USED

DIVISION 01 - GENERAL REQUIREMENTS

SECTION	01 1100 - Summary of Work
	01 2100 - Allowance
	01 2513 - Product Options and Substitutions
	01 2600 - Changes in the Work
	01 2900 - Application for Payment and Conditional and Unconditional Waiver and Release Forms
	01 3119 - Project Meetings
	01 3213 - Scheduling of Work
	01 3300 - Submittal (Including Submittal Transmittal, Substitution Request, RFI, Electronic Data Request, Certification of Compliance for Building Materials, Roof Certification)
	01 3513.23 - Site Standards
	01 3516 - Alteration Project Procedures
	01 3543 - Environmental Procedures
	01 4100 - Regulatory Requirements
	01 4213 - Abbreviations and Acronyms
	01 4216 - Definitions
	01 4219 - References
	01 4300 - Materials and Equipment
	01 4500 - Quality Control
	01 4516 - Field Quality Control Procedures
	01 4523 - Testing and Inspection Services
	01 5000 - Temporary Facilities and Controls
	01 5013 - Construction Waste Management and Disposal
	01 5213 - Field Offices
	01 5639 - Temporary Tree Protection
	01 5713.10 - Erosion Control
	01 6116.10 - Volatile Organic Compound (VOC) Restrictions
	01 6600 - Product Delivery Storage and Handling
	01 7123 - Field Engineering
	01 7329 - Cutting and Patching
	01 7419 - Construction Waste Management and Disposal
	01 7419A - Contractor's Construction Waste and Recycling Plan
	01 7419B - Contractor's Reuse, Recycling and Disposal Report
	01 7600 - Alteration Project Procedures
	01 7700 - Contract Closeout and Final Cleaning
	01 7823 - Operation and Maintenance Data
	01 7836 - Warranties (Including Contractor Standard Warranty Form, Subcontractor Standard Warranty Form, Special Extended Warranty Form)
	01 7839 - Record Documents
	01 8113.10 - Sustainable Design Requirements

DIVISION 02 - EXISTING CONDITIONS - NOT USED

DIVISION 03 - CONCRETE - NOT USED

DIVISION 04 - MASONRY - NOT USED

DIVISION 05 - METALS - NOT USED

DIVISION 06 - WOOD, PLASTICS, AND COMPOSITES - NOT USED

DIVISION 07 - THERMAL AND MOISTURE PROTECTION - NOT USED

TABLE OF CONTENTS

DIVISION 08 - OPENINGS - NOT USED

DIVISION 09 - FINISHES - NOT USED

DIVISION 10 - SPECIALTIES

DIVISION 11 - EQUIPMENT - NOT USED

DIVISION 12 - FURNISHINGS - NOT USED

DIVISION 13 - SPECIAL CONSTRUCTION - NOT USED

DIVISION 14 - CONVEYING EQUIPMENT - NOT USED

DIVISION 21 - FIRE SUPPRESSION - NOT USED

DIVISION 22 - PLUMBING - NOT USED

DIVISION 23 - HEATING, VENTILATING AND AIR CONDITIONING (HVAC) - NOT USED

DIVISION 26 - ELECTRICAL - NOT USED

DIVISION 27 - COMMUNICATIONS - NOT USED

DIVISION 28 - ELECTRONIC SAFETY AND SECURITY - NOT USED

DIVISION 31 - EARTHWORK

SECTION 31 0000 - Earthwork
 31 2333 - Trenching and Backfilling

DIVISION 32 - EXTERIOR IMPROVEMENTS

SECTION 32 1200 - Asphalt Concrete Paving
 32 1600 - Site Concrete
 32 1816.16 - Synthetic Turf
 32 8000 - Irrigation
 32 9000 - Landscaping

DIVISION 33 - UTILITIES

SECTION 33 0000 - Utilities
 33 4000 - Storm Drainage Utilities

SUMMARY OF WORK

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Site Access Conditions and Requirements;
- B. Special Conditions.

1.02 SUMMARY OF WORK COVERED BY CONTRACT DOCUMENTS

- A. The Work of this Contract consists of the following at Wanda Hirsch Elementary School:
 - (1) Construction and installation of 1 - 30'x40' Four Post Hip PC shade structure, 1 - 20'x60' Triangle PC shade structure, and related civil and landscape upgrades.

1.03 CONTRACTS

- A. Perform the Work under a single, fixed-price Contract.

1.04 WORK BY OTHERS

- A. Fabrication of the shade structures and play apparatus.

1.05 CODES, REGULATIONS, AND STANDARDS

- A. The codes, regulations, and standards adopted by the state and federal agencies having jurisdiction shall govern minimum requirements for this Project. Where codes, regulations, and standards conflict with the Contract Documents, these conflicts shall be brought to the immediate attention of the District and the Architect.
- B. Codes, regulations, and standards shall be as published effective as of date of bid opening, unless otherwise specified or indicated.

1.06 PROJECT RECORD DOCUMENTS

- A. Contractor shall maintain on Site one set of the following record documents; Contractor shall record actual revisions to the Work:
 - (1) Contract Drawings.
 - (2) Specifications.

- (3) Addenda.
 - (4) Change Orders and other modifications to the Contract.
 - (5) Reviewed shop drawings, product data, and samples.
 - (6) Field test records.
 - (7) Inspection certificates.
 - (8) Manufacturer's certificates.
- B. Contractor shall store Record Documents separate from documents used for construction. Provide files, racks, and secure storage for Record Documents and samples.
 - C. Contractor shall record information concurrent with construction progress.
 - D. Specifications: Contractor shall legibly mark and record at each product section of the Specifications the description of the actual product(s) installed, including the following:
 - (1) Manufacturer's name and product model and number.
 - (2) Product substitutions or alternates utilized.
 - (3) Changes made by Addenda and Change Orders and written directives.

1.07 EXAMINATION OF EXISTING CONDITIONS

- A. Contractor shall be held to have examined the Project Site and acquainted itself with the conditions of the Site and of the streets or roads approaching the Site.
- B. Prior to commencement of Work, Contractor shall survey the Site and existing buildings and improvements to observe existing damage and defects such as cracks, sags, broken, missing or damaged glazing, other building elements and Site improvements, and other damage.
- C. Should Contractor observe cracks, sags, and other damage to and defects of the Site and adjacent buildings, paving, and other items not indicated in the Contract Documents, Contractor shall immediately report same to the District and the Architect.

1.08 CONTRACTOR'S USE OF PREMISES

- A. If unoccupied and only with District's prior written approval, Contractor may use the building(s) at the Project Site without limitation for its operations, storage, and office facilities for the performance of the Work. If the District chooses to beneficially occupy any building(s), Contractor must obtain the District's written approval for Contractor's use of spaces and types of operations to be performed within the building(s) while so occupied. Contractor's access to the building(s) shall be limited to the areas indicated.

- B. If the space at the Project Site is not sufficient for Contractor's operations, storage, office facilities and/or parking, Contractor shall arrange and pay for any additional facilities needed by Contractor.
- C. Contractor shall not interfere with use of or access to occupied portions of the building(s) or adjacent property.
- D. Contractor shall maintain corridors, stairs, halls, and other exit-ways of building clear and free of debris and obstructions at all times.
- E. No one other than those directly involved in the demolition and construction, or specifically designated by the District or the Architect shall be permitted in the areas of work during demolition and construction activities.
- F. The Contractor shall install the construction fence and maintain that it will be locked when not in use. Keys to this fencing will be provided to the District.

1.09 PROTECTION OF EXISTING STRUCTURES AND UTILITIES

- A. The Drawings show above-grade and below-grade structures, utility lines, and other installations that are known or believed to exist in the area of the Work. Contractor shall locate these existing installations before proceeding with excavation and other operations that could damage same; maintain them in service, where appropriate; and repair damage to them caused by the performance of the Work. Should damage occur to these existing installations, the costs of repair shall be at the Contractor's expense and made to the District's satisfaction.
- B. Contractor shall be alert to the possibility of the existence of additional structures and utilities. If Contractor encounters additional structures and utilities, Contractor will immediately report to the District for disposition of same as indicated in the General Conditions.

1.10 UTILITY SHUTDOWNS AND INTERRUPTIONS

- A. Contractor shall give the District a minimum of three (3) days written notice in advance of any need to shut off existing utility services or to effect equipment interruptions. The District will set exact time and duration for shutdown, and will assist Contractor with shutdown. Work required to re-establish utility services shall be performed by the Contractor.
- B. Contractor shall obtain District's written approval as indicated in the General Conditions in advance of deliveries of material or equipment or other activities that may conflict with District's use of the building(s) or adjacent facilities.

1.11 STRUCTURAL INTEGRITY

- A. Contractor shall be responsible for and supervise each operation and work that could affect structural integrity of various building elements, both permanent and temporary.
- B. Contractor shall include structural connections and fastenings as indicated or required for complete performance of the Work.

PART 2 – PRODUCTS Not Used.

PART 3 – EXECUTION Not Used.

END OF DOCUMENT

ALLOWANCE

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Non-specified work.

1.2 RELATED SECTIONS

A. Document 01 10 00 (Summary of Work)

B. Document 01 29 00 (Application for Payment)

C. Document 01 33 00 (Submittal Procedures)

1.3 ALLOWANCES

- A. Included in the Contract, a stipulated sum/price of **[INSERT AMOUNT]** as an allowance for DSA Revisions within the limits set forth in the Contract Documents. This Allowance shall not be utilized without written approval by the District.
- B. Contractor's costs, without overhead and profit, for products, delivery, installation, labor, insurance, payroll, taxes, bonding and equipment rental will be included in Allowance Expenditure Directive authorizing expenditure of funds from this Allowance. No overhead and profit shall be added to the Allowance Expenditure Directive.
- C. Funds will be drawn from Allowance only with District approval evidenced by an Allowance Expenditure Directive.
- D. At Contract closeout, funds remaining in Allowance will be credited to District by Change Order.
- E. Whenever costs are more than the Allowance, the amount covered by the Allowance will be approved at cost. The Contract Price shall be adjusted by Change Order for amounts in excess of the Allowance.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

END OF DOCUMENT

PRODUCT OPTIONS AND SUBSTITUTIONS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. Instructions to Bidders;
- B. General Conditions, including, without limitation, Substitutions For Specified Items; and
- C. Special Conditions.

1.02 SUBSTITUTIONS OF MATERIALS AND EQUIPMENT

- A. Catalog numbers and specific brands or trade names followed by the designation "or equal" are used in conjunction with material and equipment required by the Specifications to establish the standards of quality, utility, and appearance required. Substitutions which are equal in quality, utility, and appearance to those specified may be reviewed subject to the provisions of the General Conditions.
- B. Wherever more than one manufacturer's product is specified, the first-named product is the basis for the design used in the work and the use of alternative-named manufacturers' products or substitutes may require modifications in that design. If such alternatives are proposed by Contractor and are approved by the District and/or the Architect, Contractor shall assume all costs required to make necessary revisions and modifications of the design resulting from the substitutions requested by the Contractor.
- C. When materials and equipment are specified by first manufacturer's name and product number, second manufacturer's name and "or approved equal," supporting data for the second product, if proposed by Contractor, shall be submitted in accordance with the requirements for substitutions. The District's Board has found and determined that certain item(s) shall be used on this Project based on the purpose(s) indicated pursuant to Public Contract Code section 3400(c). These findings, as well as the products and brand or trade names, have been identified in the Notice to Bidders.
- D. The Contractor will not be allowed to substitute specified items unless the request for substitution is submitted as follows:
 - (1) District must receive any notice of request for substitution of a specified item a minimum of ten (10) calendar days prior to bid opening.

- (2) Within 35 days after the date of the Notice of Award, the Contractor shall submit data substantiating the request(s) for all substitution(s) containing sufficient information to assess acceptability of product or system and impact on Project, including, without limitation, the requirements specified in the Special Conditions and the technical Specifications. Insufficient information shall be grounds for rejection of substitution.
- E. If the District and/or Architect, in reviewing proposed substitute materials and equipment, require revisions or corrections to be made to previously accepted Shop Drawings and supplemental supporting data to be resubmitted, Contractor shall promptly do so. If any proposed substitution is judged by the District and/or Architect to be unacceptable, the specified material or equipment shall be provided.
- F. Samples may be required. Tests required by the District and/or Architect for the determination of quality and utility shall be made at the expense of Contractor, with acceptance of the test procedure first given by the District.
- G. In reviewing the supporting data submitted for substitutions, the District and/or Architect will use for purposes of comparison all the characteristics of the specified material or equipment as they appear in the manufacturer's published data even though all the characteristics may not have been particularly mentioned in the Contract Documents. If more than two (2) submissions of supporting data are required, the cost of reviewing the additional supporting data shall be borne by Contractor, and the District will deduct the costs from the Contract Price. The Contractor shall be responsible for any re-design costs occasioned by District's acceptance and/or approval of any substitute.
- H. The Contractor shall, in the event that a substitute is less costly than that specified, credit the District with one hundred percent (100%) of the net difference between the substitute and the originally specified material. In this event, the Contractor agrees to execute a deductive Change Order to reflect that credit. In the event Contractor furnishes a material, process, or article more expensive than that specified, the difference in the cost of that material, process, or article so furnished shall be borne by Contractor.
- I. In no event shall the District be liable for any increase in Contract Price or Contract Time due to any claimed delay in the evaluation of any proposed substitute or in the acceptance or rejection of any proposed substitute.

PART 2 – PRODUCTS Not Used.

PART 3 – EXECUTION Not Used.

END OF DOCUMENT

DOCUMENT 01 26 00

CHANGES IN THE WORK

CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE PROVISIONS IN THE AGREEMENT, GENERAL CONDITIONS, AND SPECIAL CONDITIONS, IF USED, RELATED TO CHANGES AND/OR REQUESTS FOR CHANGES.

END OF DOCUMENT

DOCUMENT 01 29 00

**APPLICATION FOR PAYMENT AND
CONDITIONAL AND UNCONDITIONAL WAIVER AND RELEASE FORMS**

**CONTRACTOR SHALL COMPLY WITH ALL PROVISIONS IN THE GENERAL
CONDITIONS RELATED TO APPLICATIONS FOR PAYMENT AND/OR PAYMENTS.**

**CONDITIONAL WAIVER AND RELEASE
ON PROGRESS PAYMENT
(CIVIL CODE SECTION 8132)**

NOTICE: THIS DOCUMENT WAIVES THE CLAIMANT'S LIEN, STOP PAYMENT NOTICE, AND PAYMENT BOND RIGHTS EFFECTIVE ON RECEIPT OF PAYMENT. A PERSON SHOULD NOT RELY ON THIS DOCUMENT UNLESS SATISFIED THAT THE CLAIMANT HAS RECEIVED PAYMENT.

Name of Claimant: _____

Name of Customer: _____

Job Location: _____

Owner: _____

Through Date: _____

Conditional Waiver and Release

This document waives and releases lien, stop payment notice, and payment bond rights the claimant has for labor and service provided, and equipment and material delivered, to the customer on this job through the Through Date of this document. Rights based upon labor or service provided, or equipment or material delivered, pursuant to a written change order that has been fully executed by the parties prior to the date that this document is signed by the claimant, are waived and released by this document, unless listed as an Exception below. This document is effective only on the claimant's receipt of payment from the financial institution on which the following check is drawn:

Maker of Check: _____

Amount of Check: \$_____

Check Payable to: _____

Exceptions

This document does not affect any of the following:

- (1) Retentions.
- (2) Extras for which the claimant has not received payment.
- (3) The following progress payments for which the claimant has previously given a conditional waiver and release but has not received payment:

Date(s) of waiver and release: _____

Amount(s) of unpaid progress payment(s): \$_____

TRACY UNIFIED SCHOOL DISTRICT

**APPLICATION FOR PAYMENT AND
CONDITIONAL AND UNCONDITIONAL
WAIVER AND RELEASE FORMS
DOCUMENT 01 29 00-2**

- (4) Contract rights, including (A) a right based on rescission, abandonment, or breach of contract, and (B) the right to recover compensation for work not compensated by the payment.

Claimant's Signature: _____

Claimant's Title: _____

Date of Signature: _____

**UNCONDITIONAL WAIVER AND RELEASE
ON PROGRESS PAYMENT
(CIVIL CODE SECTION 8134)**

NOTICE TO CLAIMANT: THIS DOCUMENT WAIVES AND RELEASES LIEN, STOP PAYMENT NOTICE, AND PAYMENT BOND RIGHTS UNCONDITIONALLY AND STATES THAT YOU HAVE BEEN PAID FOR GIVING UP THOSE RIGHTS. THIS DOCUMENT IS ENFORCEABLE AGAINST YOU IF YOU SIGN IT, EVEN IF YOU HAVE NOT BEEN PAID. IF YOU HAVE NOT BEEN PAID, USE A CONDITIONAL WAIVER AND RELEASE FORM.

Name of Claimant: _____

Name of Customer: _____

Job Location: _____

Owner: _____

Through Date: _____

Unconditional Waiver and Release

This document waives and releases lien, stop payment notice, and payment bond rights the claimant has for labor and service provided, and equipment and material delivered, to the customer on this job through the Through Date of this document. Rights based upon labor or service provided, or equipment or material delivered, pursuant to a written change order that has been fully executed by the parties prior to the date that this document is signed by the claimant, are waived and released by this document, unless listed as an Exception below. The claimant has received the following progress payment: \$_____

Exceptions

This document does not affect any of the following:

- (1) Retentions.
- (2) Extras for which the claimant has not received payment.
- (3) Contract rights, including (A) a right based on rescission, abandonment, or breach of contract, and (B) the right to recover compensation for work not compensated by the payment.

Claimant's Signature: _____

Claimant's Title: _____

Date of Signature: _____

**CONDITIONAL WAIVER AND RELEASE
ON FINAL PAYMENT**
(CIVIL CODE SECTION 8136)

NOTICE: THIS DOCUMENT WAIVES THE CLAIMANT'S LIEN, STOP PAYMENT NOTICE, AND PAYMENT BOND RIGHTS EFFECTIVE ON RECEIPT OF PAYMENT. A PERSON SHOULD NOT RELY ON THIS DOCUMENT UNLESS SATISFIED THAT THE CLAIMANT HAS RECEIVED PAYMENT.

Name of Claimant: _____

Name of Customer: _____

Job Location: _____

Owner: _____

Conditional Waiver and Release

This document waives and releases lien, stop payment notice, and payment bond rights the claimant has for labor and service provided, and equipment and material delivered, to the customer on this job. Rights based upon labor or service provided, or equipment or material delivered, pursuant to a written change order that has been fully executed by the parties prior to the date that this document is signed by the claimant, are waived and released by this document, unless listed as an Exception below. This document is effective only on the claimant's receipt of payment from the financial institution on which the following check is drawn:

Maker of Check:

Amount of Check: \$_____

Check Payable to: _____

Exceptions

This document does not affect any of the following: _____

Disputed claims for extras in the amount of: \$_____

Claimant's Signature: _____

Claimant's Title: _____

Date of Signature: _____

**UNCONDITIONAL WAIVER AND RELEASE
ON FINAL PAYMENT**
(CIVIL CODE SECTION 8138)

NOTICE TO CLAIMANT: THIS DOCUMENT WAIVES AND RELEASES LIEN, STOP PAYMENT NOTICE, AND PAYMENT BOND RIGHTS UNCONDITIONALLY AND STATES THAT YOU HAVE BEEN PAID FOR GIVING UP THOSE RIGHTS. THIS DOCUMENT IS ENFORCEABLE AGAINST YOU IF YOU SIGN IT, EVEN IF YOU HAVE NOT BEEN PAID. IF YOU HAVE NOT BEEN PAID, USE A CONDITIONAL WAIVER AND RELEASE FORM.

Name of Claimant: _____

Name of Customer: _____

Job Location: _____

Owner: _____

Unconditional Waiver and Release

This document waives and releases lien, stop payment notice, and payment bond rights the claimant has for all labor and service provided, and equipment and material delivered, to the customer on this job. Rights based upon labor or service provided, or equipment or material delivered, pursuant to a written change order that has been fully executed by the parties prior to the date that this document is signed by the claimant, are waived and released by this document, unless listed as an Exception below. The claimant has been paid in full.

Exceptions

This document does not affect any of the following: _____

Disputed claims for extras in the amount of: \$_____

Claimant's Signature: _____

Claimant's Title: _____

Date of Signature: _____

PROJECT MEETINGS

PART 1 – GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions; and
- B. Special Conditions.

1.02 PROGRESS MEETINGS:

- A. Contractor shall schedule and hold regular weekly progress meetings after a minimum of one week's prior written notice of the meeting date and time to all Invitees as indicated below.
- B. Location: Contractor's field office.
- C. The Contractor shall notify and invite the following entities ("Invitees"):
 - (1) District Representative.
 - (2) Contractor.
 - (3) Contractor's Project Manager.
 - (4) Contractor's Superintendent.
 - (5) Subcontractors, as appropriate to the agenda of the meeting.
 - (6) Suppliers, as appropriate to the agenda of the meeting.
 - (7) Construction Manager, if any.
 - (8) Architect
 - (9) Engineer(s), if any and as appropriate to the agenda of the meeting.
 - (10) Others, as appropriate to the agenda of the meeting.
- D. The District's and/or the Architect's Consultants will attend at their discretion, in response to the agenda.
- E. The District representative, the Construction Manager, and/or another District Agent shall take and distribute meeting notes to attendees and other concerned parties. If exceptions are taken to anything in the meeting notes,

those exceptions shall be stated in writing to the District within five (5) working days following District's distribution of the meeting notes.

1.03 PRE-INSTALLATION/PERFORMANCE MEETING:

- A. Contractor shall schedule a meeting prior to the start of each of the demolition work phases. Contractor shall invite all Invitees to this meeting, and others whose work may affect or be affected by the quality of the demolition work.
- B. Contractor shall review in detail prior to this meeting, the manufacturer's requirements and specifications, applicable portions of the Contract Documents, Shop Drawings, and other submittals, and other related work. At this meeting, invitees shall review and resolve conflicts, incompatibilities, or inadequacies discovered or anticipated.
- C. Contractor shall review in detail Project conditions, schedule, requirements for performance, application, installation, and quality of completed Work, and protection of adjacent Work and property.
- D. Contractor shall review in detail means of protecting the completed Work during the remainder of the construction period.

PART 2 - PRODUCTS Not Used.

PART 3 - EXECUTION Not Used.

END OF DOCUMENT

SCHEDULING OF WORK

PART 1 – GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions;
- B. Special Conditions;
- C. Summary of Work; and
- D. Submittals.

1.02 SECTION INCLUDES

- A. Scheduling of Work under this Contract shall be performed by Contractor in accordance with requirements of this Section.
 - (1) Development of schedule, cost and resource loading of the schedule, monthly payment requests, and project status reporting requirements of the Contract shall employ computerized Critical Path Method ("CPM") scheduling ("CPM Schedule").
 - (2) CPM Schedule shall be cost loaded based on Schedule of Values as approved by District.
 - (3) Submit schedules and reports as specified in the General Conditions.
- B. Upon Award of Contract, Contractor shall immediately commence development of Initial and Original CPM Schedules to ensure compliance with CPM Schedule submittal requirements.

1.03 CONSTRUCTION SCHEDULE

- A. Within ten (10) days of issuance of the issuance Notice to Proceed and before request for first progress payment, the Contractor shall prepare and submit to the Project Manager a construction progress schedule conforming to the Milestone Schedule below.
- B. The Construction Schedule shall be continuously updated, and an updated schedule shall be submitted with each application for progress payment. Each revised schedule shall indicate the work actually accomplished during the previous period and the schedule for completion of the remaining work.

C. Milestone Schedule:

ACTIVITY DESCRIPTION

REQUIRED COMPLETION

CONSTRUCTION STARTS

05-26-2022

PHASE 1 DEMOLITION

PHASE 2 DEMOLITION

FINAL PROJECT COMPLETION

1.04 QUALIFICATIONS

- A. Contractor shall employ experienced scheduling personnel qualified to use the latest version of [i.e., Primavera Project Planner]. Experience level required is set forth below. Contractor may employ such personnel directly or may employ a consultant for this purpose.
- (1) The written statement shall identify the individual who will perform CPM scheduling.
 - (2) Capability and experience shall be verified by description of construction projects on which individual has successfully applied computerized CPM.
 - (3) Required level of experience shall include at least two (2) projects of similar nature and scope with value not less than three fourths ($\frac{3}{4}$) of the Total Bid Price of this Project. The written statement shall provide contact persons for referenced projects with current telephone and address information.
- B. District reserves the right to approve or reject Contractor's scheduler or consultant at any time. District reserves the right to refuse replacing of Contractor's scheduler or consultant, if District believes replacement will negatively affect the scheduling of Work under this Contract.

1.05 GENERAL

- A. Progress Schedule shall be based on and incorporate milestone and completion dates specified in Contract Documents.
- B. Overall time of completion and time of completion for each milestone shown on Progress Schedule shall adhere to times in the Contract, unless an earlier (advanced) time of completion is requested by Contractor and agreed to by District. Any such agreement shall be formalized by a Change Order.
- (1) District is not required to accept an early completion schedule, i.e., one that shows an earlier completion date than the Contract Time.
 - (2) Contractor shall not be entitled to extra compensation in event agreement is reached on an earlier completion schedule and Contractor completes its Work, for whatever reason, beyond completion date shown in its early completion schedule but within the Contract Time.

- (3) A schedule showing the work completed in less than the Contract Time, and that has been accepted by District, shall be considered to have Project Float. The Project Float is the time between the scheduled completion of the work and the Completion Date. Project Float is a resource available to both District and the Contractor.
- C. Ownership Project Float: Neither the District nor Contractor owns Project Float. The Project owns the Project Float. As such, liability for delay of the Completion Date rests with the party whose actions, last in time, actually cause delay to the Completion Date.
 - (1) For example, if Party A uses some, but not all of the Project Float and Party B later uses remainder of the Project Float as well as additional time beyond the Project Float, Party B shall be liable for the time that represents a delay to the Completion Date.
 - (2) Party A would not be responsible for the time since it did not consume the entire Project Float and additional Project Float remained; therefore, the Completion Date was unaffected by Party A.
- D. Progress Schedule shall be the basis for evaluating job progress, payment requests, and time extension requests. Responsibility for developing Contract CPM Schedule and monitoring actual progress as compared to Progress Schedule rests with Contractor.
- E. Failure of Progress Schedule to include any element of the Work, or any inaccuracy in Progress Schedule, will not relieve Contractor from responsibility for accomplishing the Work in accordance with the Contract. District's acceptance of schedule shall be for its use in monitoring and evaluating job progress, payment requests, and time extension requests and shall not, in any manner, impose a duty of care upon District, or act to relieve Contractor of its responsibility for means and methods of construction.
- F. Software: Use [i.e, District Project Planner for Windows, latest version]. Such software shall be compatible with Windows operating system. Contractor shall transmit contract file to District on compact disk at times requested by District.
- G. Transmit each item under the form approved by District.
 - (1) Identify Project with District Contract number and name of Contractor.
 - (2) Provide space for Contractor's approval stamp and District's review stamps.
 - (3) Submittals received from sources other than Contractor will be returned to the Contractor without District's review.

1.06 INITIAL CPM SCHEDULE

- A. Initial CPM Schedule submitted for review at the pre-construction conference shall serve as Contractor's schedule for up to ninety (90) calendar days after the Notice to Proceed.

- B. Indicate detailed plan for the Work to be completed in first ninety (90) days of the Contract; details of planned mobilization of plant and equipment; sequence of early operations; procurement of materials and equipment. Show Work beyond ninety (90) calendar days in summary form.
- C. Initial CPM Schedule shall be time scaled.
- D. Initial CPM Schedule shall be cost and resource loaded. Accepted cost and resource loaded schedule will be used as basis for monthly progress payments until acceptance of the Original CPM Schedule. Use of Initial CPM Schedule for progress payments shall not exceed ninety (90) calendar days.
- E. District and Contractor shall meet to review and discuss the Initial CPM Schedule within seven (7) calendar days after it has been submitted to District.
 - (1) District's review and comment on the schedule shall be limited to Contract conformance (with sequencing, coordination, and milestone requirements).
 - (2) Contractor shall make corrections to schedule necessary to comply with Contract requirements and shall adjust schedule to incorporate any missing information requested by District. Contractor shall resubmit Initial CPM Schedule if requested by District.
- F. If, during the first ninety (90) days after Notice to Proceed, the Contractor is of the opinion that any of the Work included on its Initial CPM Schedule has been impacted, the Contractor shall submit to District a written Time Impact Evaluation ("TIE") in accordance with Article 1.12 of this Section. The TIE shall be based on the most current update of the Initial CPM Schedule.

1.07 ORIGINAL CPM SCHEDULE

- A. Submit a detailed proposed Original CPM Schedule presenting an orderly and realistic plan for completion of the Work in conformance with requirements as specified herein.
- B. Progress Schedule shall include or comply with following requirements:
 - (1) Time scaled, cost and resource (labor and major equipment) loaded CPM schedule.
 - (2) No activity on schedule shall have duration longer than fifteen (15) work days, with exception of submittal, approval, fabrication and procurement activities, unless otherwise approved by District.
 - (a) Activity durations shall be total number of actual work days required to perform that activity.
 - (3) The start and completion dates of all items of Work, their major components, and milestone completion dates, if any.

- (4) District furnished materials and equipment, if any, identified as separate activities.
- (5) Activities for maintaining Project Record Documents.
- (6) Dependencies (or relationships) between activities.
- (7) Processing/approval of submittals and shop drawings for all material and equipment required per the Contract. Activities that are dependent on submittal acceptance or material delivery shall not be scheduled to start earlier than expected acceptance or delivery dates.
 - (a) Include time for submittals, re-submittals and reviews by District. Coordinate with accepted schedule for submission of Shop Drawings, samples, and other submittals.
 - (b) Contractor shall be responsible for all impacts resulting from re-submittal of Shop Drawings and submittals.
- (8) Procurement of major equipment, through receipt and inspection at jobsite, identified as separate activity.
 - (a) Include time for fabrication and delivery of manufactured products for the Work.
 - (b) Show dependencies between procurement and construction.
- (9) Activity description; what Work is to be accomplished and where.
- (10) The total cost of performing each activity shall be total of labor, material, and equipment, excluding overhead and profit of Contractor. Overhead and profit of the General Contractor shall be shown as a separate activity in the schedule. Sum of cost for all activities shall equal total Contract value.
- (11) Resources required (labor and major equipment) to perform each activity.
- (12) Responsibility code for each activity corresponding to Contractor or Subcontractor responsible for performing the Work.
- (13) Identify the activities which constitute the controlling operations or critical path. No more than twenty-five (25%) of the activities shall be critical or near critical. Near critical is defined as float in the range of one (1) to (10) days.
- (14) Twenty (20) workdays for developing punch list(s), completion of punch-list items, and final clean up for the Work or any designated portion thereof. No other activities shall be scheduled during this period.
- (15) Interface with the work of other contractors, District, and agencies such as, but not limited to, utility companies.

- (16) Show detailed Subcontractor Work activities. In addition, furnish copies of Subcontractor schedules upon which CPM was built.
 - (a) Also furnish for each Subcontractor, as determined by District, submitted on Subcontractor letterhead, a statement certifying that Subcontractor concurs with Contractor's Original CPM Schedule and that Subcontractor's related schedules have been incorporated, including activity duration, cost and resource loading.
 - (b) Subcontractor schedules shall be independently derived and not a copy of Contractor's schedule.
 - (c) In addition to Contractor's schedule and resource loading, obtain from electrical, mechanical, and plumbing Subcontractors, and other Subcontractors as required by District, productivity calculations common to their trades, such as units per person day, feet of pipe per day per person, feet of wiring per day per person, and similar information.
 - (d) Furnish schedule for Contractor/Subcontractor CPM schedule meetings which shall be held prior to submission of Original CPM schedule to District. District shall be permitted to attend scheduled meetings as an observer.
- (17) Activity durations shall be in Work days.
- (18) Submit with the schedule a list of anticipated non-Work days, such as weekends and holidays. The Progress Schedule shall exclude in its Work day calendar all non-Work days on which Contractor anticipates critical Work will not be performed.
- C. Original CPM Schedule Review Meeting: Contractor shall, within sixty (60) days from the Notice to Proceed date, meet with District to review the Original CPM Schedule submittal.
 - (1) Contractor shall have its Project Manager, Project Superintendent, Project Scheduler, and key Subcontractor representatives, as required by District, in attendance. The meeting will take place over a continuous one (1) day period.
 - (2) District's review will be limited to submittal's conformance to Contract requirements including, but not limited to, coordination requirements. However, review may also include:
 - (a) Clarifications of Contract Requirements.
 - (b) Directions to include activities and information missing from submittal.
 - (c) Requests to Contractor to clarify its schedule.

- (3) Within five (5) days of the Schedule Review Meeting, Contractor shall respond in writing to all questions and comments expressed by District at the Meeting.

1.08 ADJUSTMENTS TO CPM SCHEDULE

- A. Adjustments to Original CPM Schedule: Contractor shall have adjusted the Original CPM Schedule submittal to address all review comments from original CPM Schedule review meeting and resubmit network diagrams and reports for District's review.
 - (1) District, within ten (10) days from date that Contractor submitted the revised schedule, will either:
 - (a) Accept schedule and cost and resource loaded activities as submitted, or
 - (b) Advise Contractor in writing to review any part or parts of schedule which either do not meet Contract requirements or are unsatisfactory for District to monitor Project's progress, resources, and status or evaluate monthly payment request by Contractor.
 - (2) District may accept schedule with conditions that the first monthly CPM Schedule update be revised to correct deficiencies identified.
 - (3) When schedule is accepted, it shall be considered the "Original CPM Schedule" which will then be immediately updated to reflect the current status of the work.
 - (4) District reserves right to require Contractor to adjust, add to, or clarify any portion of schedule which may later be discovered to be insufficient for monitoring of Work or approval of partial payment requests. No additional compensation will be provided for such adjustments, additions, or clarifications.
- B. Acceptance of Contractor's schedule by District will be based solely upon schedule's compliance with Contract requirements.
 - (1) By way of Contractor assigning activity durations and proposing sequence of Work, Contractor agrees to utilize sufficient and necessary management and other resources to perform work in accordance with the schedule.
 - (2) Upon submittal of schedule update, updated schedule shall be considered "current" CPM Schedule.
 - (3) Submission of Contractor's schedule to District shall not relieve Contractor of total responsibility for scheduling, sequencing, and pursuing Work to comply with requirements of Contract Documents, including adverse effects such as delays resulting from ill-timed Work.

- C. Submittal of Original CPM Schedule, and subsequent schedule updates, shall be understood to be Contractor's representation that the Schedule meets requirements of Contract Documents and that Work shall be executed in sequence indicated on the schedule.
- D. Contractor shall distribute Original CPM Schedule to Subcontractors for review and written acceptance, which shall be noted on Subcontractors' letterheads to Contractor and transmitted to District for the record.

1.09 MONTHLY CPM SCHEDULE UPDATE SUBMITTALS

- A. Following acceptance of Contractor's Original CPM Schedule, Contractor shall monitor progress of Work and adjust schedule each month to reflect actual progress and any anticipated changes to planned activities.
 - (1) Each schedule update submitted shall be complete, including all information requested for the Original CPM Schedule submittal.
 - (2) Each update shall continue to show all Work activities including those already completed. These completed activities shall accurately reflect "as built" information by indicating when activities were actually started and completed.
- B. A meeting will be held on approximately the twenty-fifth (25th) of each month to review the schedule update submittal and progress payment application.
 - (1) At this meeting, at a minimum, the following items will be reviewed: Percent (%) complete of each activity; Time Impact Evaluations for Change Orders and Time Extension Request; actual and anticipated activity sequence changes; actual and anticipated duration changes; and actual and anticipated Contractor delays.
 - (2) These meetings are considered a critical component of overall monthly schedule update submittal and Contractor shall have appropriate personnel attend. At a minimum, these meetings shall be attended by Contractor's General Superintendent and Scheduler.
 - (3) Contractor shall plan on the meeting taking no less than four (4) hours.
- C. Within five (5) working days after monthly schedule update meeting, Contractor shall submit the updated CPM Schedule update.
- D. Within five (5) work days of receipt of above noted revised submittals, District will either accept or reject monthly schedule update submittal.
 - (1) If accepted, percent (%) complete shown in monthly update will be basis for Application for Payment by the Contractor. The schedule update shall be submitted as part of the Contractor's Application for Payment.

- (2) If rejected, update shall be corrected and resubmitted by Contractor before the Application for Payment is submitted.
- E. Neither updating, changing or revising of any report, curve, schedule, or narrative submitted to District by Contractor under this Contract, nor District's review or acceptance of any such report, curve, schedule or narrative shall have the effect of amending or modifying in any way the Completion Date or milestone dates or of modifying or limiting in any way Contractor's obligations under this Contract.

1.10 SCHEDULE REVISIONS

- A. Updating the Schedule to reflect actual progress shall not be considered revisions to the Schedule. Since scheduling is a dynamic process, revisions to activity durations and sequences are expected on a monthly basis.
- B. To reflect revisions to the Schedule, the Contractor shall provide District with a written narrative with a full description and reasons for each Work activity revised. For revisions affecting the sequence of work, the Contractor shall provide a schedule diagram which compares the original sequence to the revised sequence of work. The Contractor shall provide the written narrative and schedule diagram for revisions two (2) working days in advance of the monthly schedule update meeting.
- C. Schedule revisions shall not be incorporated into any schedule update until the revisions have been reviewed by District. District may request further information and justification for schedule revisions and Contractor shall, within three (3) days, provide District with a complete written narrative response to District's request.
- D. If the Contractor's revision is still not accepted by District, and the Contractor disagrees with District's position, the Contractor has seven (7) calendar days from receipt of District's letter rejecting the revision to provide a written narrative providing full justification and explanation for the revision. The Contractor's failure to respond in writing within seven (7) calendar days of District's written rejection of a schedule revision shall be contractually interpreted as acceptance of District's position, and the Contractor waives its rights to subsequently dispute or file a claim regarding District's position.
- E. At District's discretion, the Contractor can be required to provide Subcontractor certifications of performance regarding proposed schedule revisions affecting said Subcontractors.

1.11 RECOVERY SCHEDULE

- A. If the Schedule Update shows a completion date twenty-one (21) calendar days beyond the Contract Completion Date, or individual milestone completion dates, the Contractor shall submit to District the proposed revisions to recover the lost time within seven (7) calendar days. As part of this submittal, the Contractor shall provide a written narrative for each revision made to recapture the lost time. If the revisions include sequence changes, the Contractor shall provide a schedule diagram comparing the original sequence to the revised sequence of work.

- B. The revisions shall not be incorporated into any schedule update until the revisions have been reviewed by District.
- C. If the Contractor's revisions are not accepted by District, District and the Contractor shall follow the procedures in paragraph 1.09.C, 1.09.D and 1.09.E above.
- D. At District's discretion, the Contractor can be required to provide Subcontractor certifications for revisions affecting said Subcontractors.

1.12 TIME IMPACT EVALUATION ("TIE") FOR CHANGE ORDERS, AND OTHER DELAYS

- A. When Contractor is directed to proceed with changed Work, the Contractor shall prepare and submit within fourteen (14) calendar days from the Notice to Proceed a TIE which includes both a written narrative and a schedule diagram depicting how the changed Work affects other schedule activities. The schedule diagram shall show how the Contractor proposes to incorporate the changed Work in the schedule and how it impacts the current schedule-update critical path. The Contractor is also responsible for requesting time extensions based on the TIE's impact on the critical path. The diagram must be tied to the main sequence of schedule activities to enable District to evaluate the impact of changed Work to the scheduled critical path.
- B. Contractor shall be required to comply with the requirements of Paragraph 1.09.A for all types of delays such as, but not limited to, Contractor/Subcontractor delays, adverse weather delays, strikes, procurement delays, fabrication delays, etc.
- C. Contractor shall be responsible for all costs associated with the preparation of TIEs, and the process of incorporating them into the current schedule update. The Contractor shall provide District with four (4) copies of each TIE.
- D. Once agreement has been reached on a TIE, the Contract Time will be adjusted accordingly. If agreement is not reached on a TIE, the Contract Time may be extended in an amount District allows, and the Contractor may submit a claim for additional time claimed by contractor.

1.13 TIME EXTENSIONS

- A. The Contractor is responsible for requesting time extensions for time impacts that, in the opinion of the Contractor, impact the critical path of the current schedule update. Notice of time impacts shall be given in accord with the General Conditions.
- B. Where an event for which District is responsible impacts the projected Completion Date, the Contractor shall provide a written mitigation plan, including a schedule diagram, which explains how (e.g., increase crew size, overtime, etc.) the impact can be mitigated. The Contractor shall also include a detailed cost breakdown of the labor, equipment, and material the Contractor would expend to mitigate District-caused time impact. The Contractor shall submit its mitigation plan to District within fourteen (14)

calendar days from the date of discovery of the impact. The Contractor is responsible for the cost to prepare the mitigation plan.

- C. Failure to request time, provide TIE, or provide the required mitigation plan will result in Contractor waiving its right to a time extension and cost to mitigate the delay.
- D. No time will be granted under this Contract for cumulative effect of changes.
- E. District will not be obligated to consider any time extension request unless the Contractor complies with the requirements of Contract Documents.
- F. Failure of the Contractor to perform in accordance with the current schedule update shall not be excused by submittal of time extension requests.
- G. If the Contractor does not submit a TIE within the required fourteen (14) calendar days for any issue, it is mutually agreed that the Contractor does not require a time extension for said issue.

1.14 SCHEDULE REPORTS

- A. Submit four (4) copies of the following reports with the Initial CPM Schedule, the Original CPM Schedule, and each monthly update.
- B. Required Reports:
 - (1) Two activity listing reports: one sorted by activity number and one by total Project Float. These reports shall also include each activity's early/late and actual start and finish dates, original and remaining duration, Project Float, responsibility code, and the logic relationship of activities.
 - (2) Cost report sorted by activity number including each activity's associated cost, percentage of Work accomplished, earned value- to date, previous payments, and amount earned for current update period.
 - (3) Schedule plots presenting time-scaled network diagram showing activities and their relationships with the controlling operations or critical path clearly highlighted.
 - (4) Cash flow report calculated by early start, late start, and indicating actual progress. Provide an exhibit depicting this information in graphic form.
 - (5) Planned versus actual resource (i.e., labor) histogram calculated by early start and late start.
- C. Other Reports:

In addition to above reports, District may request, from month to month, any two of the following reports. Submit four (4) copies of all reports.

- (1) Activities by early start.
 - (2) Activities by late start.
 - (3) Activities grouped by Subcontractors or selected trades.
 - (4) Activities with scheduled early start dates in a given time frame, such as fifteen (15) or thirty (30) day outlook.
- D. Furnish District with report files on compact disks containing all schedule files for each report generated.

1.15 PROJECT STATUS REPORTING

- A. In addition to submittal requirements for CPM scheduling identified in this Section, Contractor shall provide a monthly project status report (i.e., written narrative report) to be submitted in conjunction with each CPM Schedule as specified herein. Status reporting shall be in form specified below.
- B. Contractor shall prepare monthly written narrative reports of status of Project for submission to District. Written status reports shall include:
- (1) Status of major Project components (percent (%) complete, amount of time ahead or behind schedule) and an explanation of how Project will be brought back on schedule if delays have occurred.
 - (2) Progress made on critical activities indicated on CPM Schedule.
 - (3) Explanations for any lack of work on critical path activities planned to be performed during last month.
 - (4) Explanations for any schedule changes, including changes to logic or to activity durations.
 - (5) List of critical activities scheduled to be performed next month.
 - (6) Status of major material and equipment procurement.
 - (7) Any delays encountered during reporting period.
 - (8) Contractor shall provide printed report indicating actual versus planned resource loading for each trade and each activity. This report shall be provided on weekly and monthly basis.
 - (a) Actual resource shall be accumulated in field by Contractor, and shall be as noted on Contractor's daily reports. These reports will be basis for information provided in computer-generated monthly and weekly printed reports.
 - (b) Contractor shall explain all variances and mitigation measures.

- (9) Contractor may include any other information pertinent to status of Project. Contractor shall include additional status information requested by District at no additional cost.
- (10) Status reports, and the information contained therein, shall not be construed as claims, notice of claims, notice of delay, or requests for changes or compensation.

1.16 WEEKLY SCHEDULE REPORT

At the Weekly Progress Meeting, the Contractor shall provide and present a time-scaled three (3) week look-ahead schedule that is based and correlated by activity number to the current schedule (i.e., Initial, Original CPM, or Schedule Update).

1.17 DAILY CONSTRUCTION REPORTS

On a daily basis, Contractor shall submit a daily activity report to District for each workday, including weekends and holidays when worked. Contractor shall develop the daily construction reports on a computer-generated database capable of sorting daily Work, manpower, and man-hours by Contractor, Subcontractor, area, sub-area, and Change Order Work. Upon request of District, furnish computer disk of this data base. Obtain District's written approval of daily construction report data base format prior to implementation. Include in report:

- A. Project name and Project number.
- B. Contractor's name and address.
- C. Weather, temperature, and any unusual site conditions.
- D. Brief description and location of the day's scheduled activities and any special problems and accidents, including Work of Subcontractors. Descriptions shall be referenced to CPM scheduled activities.
- E. Worker quantities for its own Work force and for Subcontractors of any tier.
- F. Equipment, other than hand tools, utilized by Contractor and Subcontractors.

1.18 PERIODIC VERIFIED REPORTS

Contractor shall complete and verify construction reports on a form prescribed by the Division of the State Architect and file reports on the first day of February, May, August, and November during the preceding quarter year; at the completion of the Contract; at the completion of the Work; at the suspension of Work for a period of more than one (1) month; whenever the services of Contractor or any of Contractor's Subcontractors are terminated for any reason; and at any time a special verified report is required by the Division of the State Architect. Refer to section 4-336 and section 4-343 of Part 1, Title 24 of the California Code of Regulations.

PART 2 – PRODUCTS Not Used.

PART 3 - EXECUTION Not Used.

END OF DOCUMENT

SUBMITTALS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Contractor's Submittals and Schedules, Drawings and Specifications;
- B. Special Conditions.

1.02 SECTION INCLUDES:

- A. Definitions:
 - (1) Shop Drawings and Product Data are as indicated in the General Conditions and include, but are not limited to, fabrication, erection, layout and setting drawings, formwork and falsework drawings, manufacturers' standard drawings, descriptive literature, catalogues, brochures, performance and test data, wiring and control diagrams. In addition, there are other drawings and descriptive data pertaining to materials, equipment, piping, duct and conduit systems, and methods of construction as may be required to show that the materials, equipment or systems and all positions conform to the requirement of the Contract Documents, including, without limitation, the Drawings.
 - (2) "Manufactured" applies to standard units usually mass-produced; "fabricated" means specifically assembled or made out of selected materials to meet design requirements. Shop Drawings shall establish the actual detail of manufactured or fabricated items, indicated proper relation to adjoining work and amplify design details of mechanical and electrical equipment in proper relation to physical spaces in the structure.
 - (3) Manufacturer's Instructions: Where any item of Work is required by the Contract Documents to be furnished, installed, or performed, at a minimum, in accordance with a specified product manufacturer's instructions, the Contractor shall procure and distribute copies of these to the District, the Architect, and all other concerned parties and shall furnish, install, or perform the work, at a minimum, in accordance with those instructions.
- B. Samples, Shop Drawings, Product Data, and other items as specified, in accordance with the following requirements:
 - (1) Contractor shall submit all Shop Drawings, Product Data, and Samples to the District, the Architect, the Project Inspector, and the Construction Manager.

Contractor to review section
01 3300 as well as this
document

- (2) Contractor shall comply with all time frames herein and in the General Conditions and, in any case, shall submit required information in sufficient time to permit proper consideration and action before ordering any materials or items represented by such Shop Drawings, Product Data, and/or Samples.
- (3) Contractor shall allow sufficient time so that no delay occurs due to required lead time in ordering or delivery of any item to the Site. Contractor shall be responsible for any delay in progress of Work due to its failure to observe these requirements.
- (4) Time for completion of Work shall not be extended on account of Contractor's failure to promptly submit Shop Drawings, Product Data, and/or Samples.
- (5) Reference numbers on Shop Drawings shall have Architectural and/or Engineering Contract Drawings reference numbers for details, sections, and "cuts" shown on Shop Drawings. These reference numbers shall be in addition to any numbering system that Contractor chooses to use or has adopted as standard.
- (6) When the magnitude or complexity of submittal material prevents a complete review within the stated time frame, Contractor shall make this submittal in increments to avoid extended delays.
- (7) Contractor shall certify on submittals for review that submittals conform to Contract requirements. Also certify that Contractor-furnished equipment can be installed in allocated space. In event of any variance, Contractor shall specifically state in transmittal and on Shop Drawings, portions vary and require approval of a substitute. Submittals shall not be used as a means of requesting a substitution.
- (8) Unless specified otherwise, sampling, preparation of samples, and tests shall be in accordance with the latest standard of the American Society for Testing and Materials.
- (9) Upon demand by Architect or District, Contractor shall submit samples of materials and/or articles for tests or examinations and consideration before Contractor incorporates same in Work. Contractor shall be solely responsible for delays due to sample(s) not being submitted in time to allow for tests. Acceptance or rejection will be expressed in writing. Work shall be equal to approved samples in every respect. Samples that are of value after testing will remain the property of Contractor.

C. Submittal Schedule:

- (1) Contractor shall prepare its proposed submittal schedule that is coordinated with the proposed construction schedule and submit both to the District within ten (10) days after the date of the Notice to Proceed. Contractor's proposed schedules shall become the Project Construction Schedule and the Project Submittal Schedule after each is approved by the District.

Contractor to review section
01 3300 as well as this
document

- (2) Contractor is responsible for all lost time should the initial submittal be rejected, marked "revise and resubmit", etc.
- (3) All Submittals shall be forwarded to the District by the date indicated on the approved Submittal Schedule, unless an earlier date is necessary to maintain the Construction Schedule, in which case those Submittals shall be forwarded to the District so as not to delay the Construction Schedule.
- (4) Contractor may be assessed \$100 a day for each day it is late in submitting a shop drawing or sample. No extensions of time will be granted to Trade Contractor or any Subcontractor because of its failure to have shop drawings and samples submitted in accordance with the Schedule.

1.03 SHOP DRAWINGS:

- A. Contractor shall submit one reproducible transparency and six (6) opaque reproductions. The District will review and return the reproducible copy and one (1) opaque reproduction to Contractor.
- B. Before commencing installation of any Work, the Contractor shall submit and receive approval of all drawings, descriptive data, and material list(s) as required to accomplish Work.
- C. Review of Shop Drawings is regarded as a service to assist Contractor and in all cases original Contract Documents shall take precedence as outlined under General Conditions.
- D. No claim for extra time or payment shall be based on work shown on Shop Drawings unless the claim is (1) noted on Contractor's transmittal letter accompanying Shop Drawings and (2) Contractor has complied with all applicable provisions of the General Conditions, including, without limitation, provisions regarding changes and payment, and all required written approvals.
- E. District shall not review Shop Drawings for quantities of materials or number of items supplied.
- F. District's and/or Architect's review of Shop Drawing will be general. District and/or Architect review does not relieve Contractor of responsibility for dimensions, accuracy, proper fitting, construction of Work, furnishing of materials, or Work required by Contract Documents and not indicated on Shop Drawings. The District's and/or Architect's review of Shop Drawings is not to be construed as approving departures from Contract Documents.
- G. Review of Shop Drawings and Schedules does not relieve Contractor from responsibility for any aspect of those Drawings or Schedules that is a violation of local, County, State, or Federal laws, rules, ordinances, or rules and regulations of commissions, boards, or other authorities or utilities having jurisdiction.
- H. Before submitting Shop Drawings for review, Contractor shall check Shop Drawings of its subcontractors for accuracy, and confirm that all Work

Contractor to review section
01 3300 as well as this
document

contiguous with and having bearing on other work shown on Shop Drawings is accurately drawn and in conformance with Contract Documents.

- I. Submitted drawings and details must bear stamp of approval of Contractor:
 - (1) Stamp and signature shall clearly certify that Contractor has checked Shop Drawings for compliance with Drawings.
 - (2) If Contractor submits a Shop Drawing without an executed stamp of approval, or whenever it is evident (despite stamp) that Drawings have not been checked, the District and/or Architect will not consider them and will return them to the Contractor for revision and resubmission. In that event, it will be deemed that Contractor has not complied with this provision and Contractor shall bear risk of all delays to same extent as if it had not submitted any Shop Drawings or details.
- J. Submission of Shop Drawings (in either original submission or when resubmitted with correction) constitutes evidence that Contractor has checked all information thereon and that it accepts and is willing to perform Work as shown.
- K. Contractor shall pay for cost of any changes in construction due to improper checking and coordination. Contractor shall be responsible for all additional costs, including coordination. Contractor shall be responsible for costs incurred by itself, the District, the Architect, the Project Inspector, the Construction Manager, any other Subcontractor or contractor, etc., due to improperly checked and/or coordination of submittals.
- L. Shop Drawings must clearly delineate the following information:
 - (1) Project name and address.
 - (2) Specification number and description.
 - (3) Architect's name and project number.
 - (4) Shop Drawing title, number, date, and scale.
 - (5) Names of Contractor, Subcontractor(s) and fabricator.
 - (6) Working and erection dimensions.
 - (7) Arrangements and sectional views.
 - (8) Necessary details, including complete information for making connections with other Work.
 - (9) Kinds of materials and finishes.
 - (10) Descriptive names of materials and equipment, classified item numbers, and locations at which materials or equipment are to be installed in the Work. Contractor shall use same reference identification(s) as shown on Contract Drawings.

Contractor to review section
01 3300 as well as this
document

- M. Contractor shall prepare composite drawings and installation layouts when required to solve tight field conditions.
 - (1) Shop Drawings shall consist of dimensioned plans and elevations and must give complete information, particularly as to size and location of sleeves, inserts, attachments, openings, conduits, ducts, boxes, structural interferences, etc.
 - (2) Contractor shall coordinate these composite Shop Drawings and installation layouts in the field between itself and its Subcontractor(s) for proper relationship to the Work, the work of other trades, and the field conditions. The Contractor shall check and approve all submittal(s) before submitting them for final review.

1.04 PRODUCT DATA OR NON REPRODUCIBLE SUBMITTALS:

- A. Contractor shall submit manufacturer's printed literature in original form. Any fading type of reproduction will not be accepted. Contractor must submit a minimum of six (6) each, to the District. District shall return one (1) to the Contractor, who shall reproduce whatever additional copies it requires for distribution.
- B. Contractor shall submit six (6) copies of a complete list of all major items of mechanical, plumbing, and electrical equipment and materials in accordance with the approved Submittal Schedule, except as required earlier to comply with the approved Construction Schedule. Other items specified are to be submitted prior to commencing Work. Contractor shall submit items of like kind at one time in a neat and orderly manner. Partial lists will not be acceptable.
- C. Submittals shall include manufacturer's specifications, physical dimensions, and ratings of all equipment. Contractor shall furnish performance curves for all pumps and fans. Where printed literature describes items in addition to that item being submitted, submitted item shall be clearly marked on sheet and superfluous information shall be crossed out. If highlighting is used, Contractor shall mark all copies.
- D. Equipment submittals shall be complete and include space requirements, weight, electrical and mechanical requirements, performance data, and supplemental information that may be requested.
- E. Imported Materials Certification must be submitted at least ten (10) days before material is delivered.

1.05 SAMPLES:

- A. Contractor shall submit for approval Samples as required and within the time frame in the Contract Documents. Materials such as concrete, mortar, etc., which require on-site testing will be obtained from Project Site.
- B. Contractor shall submit four (4) samples except where greater or lesser number is specifically required by Contract Documents including, without limitation, the Specifications.

Contractor to review section
01 3300 as well as this
document

- (1) Samples must be of sufficient size and quality to clearly illustrate functional characteristics, with integrally related parts and attachment devices.
 - (2) Samples must show full range of texture, color, and pattern.
- C. Contractor shall make all Submittals, unless it has authorized Subcontractor(s) to submit and Contractor has notified the District in writing to this effect.
- D. Samples to be shipped prepaid or hand-delivered to the District.
- E. Contractor shall mark samples to show name of Project, name of Contractor submitting, Contract number and segment of Work where representative Sample will be used, all applicable Specifications Sections and documents, Contract Drawing Number and detail, and ASTM or FS reference, if applicable.
- F. Contractor shall not deliver any material to Site prior to receipt of District's and/or Architect's completed written review and approval. Contractor shall furnish materials equal in every respect to approved Samples and execute Work in conformance therewith.
- G. District's and/or Architect's review, acceptance, and/or approval of Sample(s) will not preclude rejections of any material upon discovery of defects in same prior to final acceptance of completed Work.
- H. After a material has been approved, no change in brand or make will be permitted.
- I. Contractor shall prepare its Submittal Schedule and submit Samples of materials requiring laboratory tests to specified laboratory for testing not less than ninety (90) days before such materials are required to be used in Work.
- J. Samples which are rejected must be resubmitted promptly after notification of rejection and be marked "Resubmitted Sample" in addition to other information required.
- K. Field Samples and Mock-Ups are to be removed by Contractor at District's direction:
 - (1) Size: As Specified.
 - (2) Furnish catalog numbers and similar data, as requested.

1.06 REVIEW AND RESUBMISSION REQUIREMENTS:

- A. The District will arrange for review of Sample(s), Shop Drawing(s), Product Data, and other submittal(s) by appropriate reviewer and return to Contractor as provided below within twenty-one (21) days after receipt or within twenty-one (21) days after receipt of all related information necessary for such review, whichever is later.
- B. One (1) copy of product or materials data will be returned to Contractor with the review status.

Contractor to review section
01 3300 as well as this
document

- C. Samples to be incorporated into the Work will be returned to Contractor, together with a written notice designating the Sample with the appropriate review status and indicating errors discovered on review, if any. Other Samples will not be returned, but the same notice will be given with respect thereto, and that notice shall be considered a return of the Sample.
- D. Contractor shall revise and resubmit any Sample(s), Shop Drawing(s), Product Data, and other submittal(s) as required by the reviewer. Such resubmittals will be reviewed and returned in the same manner as original Sample(s), Shop Drawing(s), Product Data, and other submittal(s), within fourteen (14) days after receipt thereof or within fourteen (14) days after receipt of all related information necessary for such review. Such resubmittal shall not delay the Work.
- E. Contractor may proceed with any of the Work covered by Sample(s), Shop Drawing(s), Product Data, and other submittal(s) upon its return if designated as no exception taken, or revise as noted, provided the Contractor proceeds in accordance with the District and/or the Architect's notes and comments.
- F. Contractor shall not begin any of the work covered by a Sample(s), Shop Drawing(s), Product Data, and other submittal(s), designated as revise and resubmit or rejected, until a revision or correction thereof has been reviewed and returned to Contractor.
- G. Sample(s), Shop Drawing(s), Product Data, and other submittal(s) designated as revise and resubmit or rejected and requiring resubmittal, shall be revised or corrected and resubmitted to the District no later than fourteen (14) days or a shorter period as required to comply with the approved Construction Schedule, after its return to Contractor.
- H. Neither the review nor the lack of review of any Sample(s), Shop Drawing(s), Product Data, and other submittal(s) shall waive any of the requirements of the Contract Documents, or relieve Contractor of any obligation thereunder.
- I. District's and/or Architect's review of Shop Drawings does not relieve the Contractor of responsibility for any errors that may exist. Contractor is responsible for the dimensions and design of adequate connections and details and for satisfactory construction of all the Work.

PART 2 – PRODUCTS Not Used.

PART 3 - EXECUTION Not Used.

END OF DOCUMENT

Villalovoz Elementary School - Shade Structures
Tracy Unified School District

SUBMITTAL NO.:

Architect's Project # 3595001

DATE: _____

DSA File/Appl. # XX-XX/XX-XXXXXX

Re-Submittal of Original No.: _____

1. SUBMITTAL TRANSMITTAL

Attention: Affifa Kadhim

Contractor: Company

Contact: Name _____

Sub Contractor:

Contact: _____

HMC
Architects

Please submit only one trade per submittal! Description of submitted materials:

Quantity submitted	Specification Section		Description of contents (e.g. product data, shop drawings, samples)
	Section #	Section Title	

Contractor Statement: (read and acknowledge)

This submittal has been reviewed and approved with respect to the means, methods, techniques, and procedures of construction, safety precautions, and program incidentals thereto. This submittal complies with the contract documents and comprises no variations thereto, unless accompanied by a substitution request.

By: _____
Name

Date: _____

2. RE-TRANSMITTAL TO CONTRACTOR:

Distribution: Contractor, Owner, Project Inspector, RGA, Other

- ☐ NO EXCEPTIONS TAKEN
☐ SUBMIT SPECIFIED ITEM

- ☐ REJECTED
☐ REVISE AND RESUBMIT

- ☐ FURNISH AS CORRECTED
☐ NO ACTION REQUIRED

Corrections or comments made on the shop drawings during this review do not relieve the Contractor from compliance with requirements of the Drawings and Specifications. This general check is only for the review of conformance with the design concept of the project and general compliance with the information given in the Contract Documents. The Contractor is responsible for confirming and correlating all quantities and dimensions, selecting fabrication processes and techniques of construction, coordinating his work with that of all the other trades, and performing his work in a safe and satisfactory manner.

HMC ARCHITECTS

By: _____

Date: _____

Additional Comments:

See Specification Section 01 3300 for use of this form

Villalovoz Elementary School - Shade Structures
Tracy Unified School District

**SUBSTITUTION
REQUEST NO.:**

Architect's Project # 3595001
DSA File/Appl. # XX-XX/XX-XXXXXX

Date: _____

1. SUBSTITUTION REQUEST

Attention: Affifa Kadhim

HMC
Architects

Contractor: Company _____

Contact: Name _____

Please submit only one product per request!

Sub Contractor: _____

Include with a specified product Submittal

Contact: _____

2. PROPOSED SUBSTITUTIONS: The undersigned requests consideration of the following substitution:

Specified Item: _____ Page No.: _____ Paragraph No.: _____

Proposed Item: _____

3. REASON FOR REQUEST:

4. REQUIREMENTS FOR SUBSTITUTIONS:

Attached data includes product description, specifications, drawings, photographs, performance and test data adequate for evaluation of request; applicable portions of data are clearly identified. Attached data also includes a description of changes to Contract Documents, which proposed substitution will require for its proper installation.

The undersigned certifies that the following paragraphs, unless modified by attachments, are correct:

1. The proposed substitution does not affect dimensions shown on drawings and does not require design changes in the Contract Documents.
2. The undersigned will pay for changes to the building design, including engineering design, detailing and construction costs caused by the requested substitution.
3. The proposed substitution will have no adverse effect on the work, the schedule or specified warranty requirements.
4. Maintenance and service parts will be readily available for the proposed substitution.

The undersigned further states that the function, appearance and quality of the proposed substitution are equivalent or superior to the specified item.

Signature - Contractor/Subcontractor

Date

5. TRANSMITTAL TO CONTRACTOR:

Distribution: Contractor, Owner, Project Inspector, RGA, Other

☐ **ACCEPTED**

☐ **ACCEPTED AS NOTED**

☐ **REJECTED**

HMC ARCHITECTS

By: _____

Date: _____

Comments:

Villalovoz Elementary School - Shade Structures
Tracy Unified School District

RFI NO.:

Architect's Project # 3595001
DSA File/Apl. # XX-XX/XX-XXXXXX

Date: _____

1. REQUEST FOR INFORMATION

Attention: Affifa Kadhim

From:

Contractor:

Company

Contact:

Name

Sub Contractor:

Contact:

HMC
Architects

Identify related specific references within the Contract Documents and supporting information:

Dwg./Document No.: _____

Building/Site Location: _____

2. Existing Condition (source / reason for the request):

3. Recommended Contractor Action(s) for resolution:

4. Project Inspector Acknowledgment:

Date Reviewed: _____

5. Owner / A/E Resolution(s):

Date of Response: _____ By: _____

Attachments: _____

Extra Work Involved in the Above Described Change?

Yes ☐

No ☐

Distribution: Contractor, Owner, Project Inspector, HMC, Other
See Specification Section 01300 for use of this form

HMC, Other

Villalovoz Elementary School - Shade Structures
Tracy Unified School District

**E-DATA
REQUEST NO.:**

Architect's Project # 3595001
DSA File/Appl. # XX-XX/XX-XXXXXX

Date: _____

1. ELECTRONIC DATA REQUEST

Attention: Affifa Kadhim

From: Contractor: Company

Contact: Name

Sub Contractor:

Contact: _____

HMC
Architects

2. DATA REQUESTED - Provide list of specific drawings requested (include sheet numbers):

3. REASON FOR REQUEST - Provide clear explanation of why information is desired and for what purpose it will be utilized:

4. ACKNOWLEDGEMENT OF RESPONSIBILITY:

The electronic data files requested are distributed for reference only. Transferring such files can alter, delete or change original information. Accuracy of the data cannot be guaranteed as correct or complete and the Contractor accepts full responsibility for any and all inaccuracies, regardless of cause.

The hard copy documents, including addenda and subsequent written changes to the documents, represent the complete work of the contract and all electronic files should be cross-referenced and verified from that information as electronic files may not contain all contract information. It is the Contractor's responsibility to make any changes or revisions necessary.

This electronic data is furnished without guarantee of compatibility with your hardware or software. It is the Contractor's responsibility to notify the Architect in the event a compatibility problem or disk defect is encountered and a replacement disk is necessary.

This electronic data, in its present form, remains the property of HMC Architects and shall not be used for any other purpose than to provide background information for the project noted above. It is not to be released to any other party without the written consent of HMC Architects.

Accepted by: _____
Signature - Contractor/Subcontractor

Representing: _____
Contractor/Subcontractor Company Name

MEGGER GROUNDING TEST CERTIFICATE

This certifies that a Megger Grounding Test for the _____ **[name of project]** _____ for the _____ **[name of District]** _____ School District, of _____ **[name of county]** _____ County, California was conducted on the _____ day of _____, **[year]**, per CCR Title 24, Sections 200 H and J. The undersigned verifies that the resistance to ground was 25 ohms or less, as required, and is found to be acceptable.

Project Name: _____

DSA File No.: _____ DSA Application No.: _____

Address: _____

General Contractor's Signature: _____

Electrical Contractor's Signature: _____

Testing Agency's Signature: _____

District Inspector's Signature: _____

SEPARATE CERTIFICATE IS REQUIRED FOR EACH SITE

CERTIFICATION OF CHLORINATION AND STERILIZATION

This certifies that _____ chlorinated the domestic hot and cold water plumbing lines for the **[name of project]**, **[name of district]** School District. The lines were first flushed and chlorine was injected in the main water line on _____, **[year]**. A minimum chlorine residual of 50 ppm was measured at each outlet. The lines were tagged, secured and the make-up water was shut off. On _____, **[year]**, (a minimum of 24 hours later) the chlorine residual was retested and found to contain a minimum of 50 ppm. The plumbing lines were then thoroughly flushed with fresh water until the chlorine residual was not greater than 0.2 ppm at all outlets. A Bacteriological Examination report has been provided.

District Inspector Signature: _____

Date _____

Name of Chlorination and Testing Firm: _____

Authorized Representative Signature: _____

Date _____

Name of General Contractor: _____

Authorized Representative Signature: _____

Date _____

CERTIFICATION OF COMPLIANCE FOR BUILDING MATERIALS

This is to certify, in accordance with the Environmental Protection Agency requirements, that the materials and equipment used in the construction of the [project name] for the [district name] School District of [name of county] County, California, are asbestos free and are, therefore, not subject to monitoring for asbestos contamination.

Project Name: _____

Address: _____

Contractor: _____

Address: _____

Signature: _____

Title: _____

Date: _____

SEPARATE CERTIFICATE IS REQUIRED FOR EACH SITE

ROOFING CERTIFICATION

This is to certify that a representative of the manufacturer has visited the site prior to installation, inspected the surfaces which the roofing is applied and accepted those surfaces.

In addition, a representative of the manufacturer has inspected the materials and methods used, verified they are in accordance with the manufacturer's recommendations, and accepts the final installation.

A guarantee for materials and workmanship is to be provided separately.

Project name: _____

Address: _____

General Contractor: _____

Roofing Contractor: _____

Scope of Work/Roofing Type: _____

Roofing Manufacturer: _____

Manufacturer's Representative: _____

Representative's Signature: _____

Date: _____

A SEPARATE CERTIFICATE IS REQUIRED FOR EACH SITE
AND FOR EACH ROOFING TYPE

SITE STANDARDS

PART 1 – GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including without limitation, Site Access, Conditions, and Regulations;
- B. Special Conditions;
- C. Drug-Free Workplace Certification;
- D. Tobacco-Free Environment Certification;
- E. Criminal Background Investigation/Fingerprinting Certification;
- F. Temporary Facilities and Controls.

1.02 REQUIREMENTS OF THE DISTRICT:

- A. Drug-Free Schools and Safety Requirements:
 - (1) All school sites and other District Facilities have been declared "Drug-Free Zones." No drugs, alcohol and/or smoking are allowed at any time in any buildings and/or grounds on District property. No students, staff, visitors, or contractors are to use drugs on these sites.
 - (2) Smoking and the use of tobacco products by all persons is prohibited on or in District property. District property includes school buildings, school grounds, school-owned vehicles and vehicles owned by others while on District property. Contractor shall post: "Non-Smoking Area" in a highly visible location in each work area, staging area, and parking area. Contractor may designate a smoking area outside of District property within the public right-of-way, provided that this area remains quiet and unobtrusive to adjacent neighbors. This smoking area is to be kept clean at all times.
 - (3) Contractor shall ensure that no alcohol, firearms, weapons, or controlled substances enter or are used at the Site. Contractor shall immediately remove from the Site and terminate the employment of any employee(s) found in violation of this provision.
- B. Language: Profanity or other unacceptable and/or loud language will not be tolerated, "Cat calls" or other derogatory language toward students, staff, volunteers, parents or public will not be allowed.

C. Disturbing the Peace (Noise and Lighting):

- (1) Contractor shall observe the noise ordinance of the Site at all times including, without limitation, all applicable local, city, and/or state laws, ordinances, and/or regulations regarding noise and allowable noise levels.
- (2) The use of radios, etc., shall be controlled to keep all sound at a level that cannot be heard beyond the immediate area of use. District reserves the right to prohibit the use of radios at the Site, except for mobile phones or other handheld communication radios.
- (3) If portable lights are used after dark, all light must be located so as not to direct light into neighboring property.

D. Traffic:

- (1) Driving on the Premises shall be limited to periods when students and public are not present. If driving or deliveries must be made during the school hours, two (2) or more ground guides shall lead the vehicle across the area of travel. In no case shall driving take place across playgrounds or other pedestrian paths during recess, lunch, and/or class period changes. The speed limit on-the Premises shall be five (5) miles per hour (maximum) or less if conditions require.
- (2) All paths of travel for deliveries, including without limitation, material, equipment, and supply deliveries, shall be reviewed and approved by District in advance. Any damage will be repaired to the pre-damaged condition by the Contractor.
- (3) District shall designate a construction entry to the Site. If Contractor requests, District determines it is required, and to the extent possible, District shall designate a staging area so as not to interfere with the normal functioning of school facilities. Location of gates and fencing shall be approved in advance with District and at Contractor's expense.
- (4) Parking areas shall be reviewed and approved by District in advance. No parking is to occur under the drip line of trees or in softscape areas that could otherwise be damaged.

- E. All of the above shall be observed and complied with by the Contractor and all workers on the Site. Failure to follow these directives could result in individual(s) being suspended or removed from the work force at the discretion of the District. The same rules and regulations shall apply equally to delivery personnel, inspectors, consultants, and other visitors to the Site.

PART 2 - PRODUCTS Not Used.

PART 3 - EXECUTION Not Used.

END OF DOCUMENT

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Alteration requirements for modernizations, remodels, and additions.

1.2 RELATED REQUIREMENTS

- A. Section 01 1100, Summary of Work.
- B. Section 01 5000, Temporary Facilities and Controls.
- C. Section 01 7329, Cutting and Patching.

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CALGreen), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Coordination:
 - 1. Contractor to coordinate and conduct a meeting with the demolition contractor to verify which systems, if any, are to be protected and maintained. Such systems shall be clearly identified and marked to avoid unnecessary damage or removal.
 - 2. Coordinate work of alterations and renovations to expedite completion sequentially and to accommodate Owner occupancy.

1.5 QUALITY ASSURANCE

- A. Manufacturer and Installer Qualifications: As specified in the product specifications.
- B. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.
- C. Single Source Responsibility: Use materials and products of one manufacturer whenever possible.
- D. All materials, components, assemblies, workmanship and installation are to be observed by the Owner's Inspector of Record. Work not so inspected is subject to uncovering and replacement.

ALTERATION PROJECT PROCEDURES
SECTION 01 3516
3595001

1.6 FIELD CONDITIONS

- A. Make and be responsible for all field dimensions necessary for proper fitting and completion of work. Report discrepancies to Architect before proceeding.

PART 2 - PRODUCTS

2.1 PRODUCTS FOR PATCHING AND EXTENDING WORK

- A. New Materials: As specified in product Sections; match existing products and work for patching and extending work.
- B. Type and Quality of Existing Products: Determine by inspection and testing products where necessary, referring to existing work as a standard.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that demolition is complete and areas are ready for installation of new work.
- B. Inspect conditions of uncovered work affecting installation of products or performance work.
- C. Verify that specified items may be installed in accordance with the approved design.
- D. Beginning of restoration work means acceptance of existing conditions.
- E. In event of discrepancy, immediately notify Architect. Do not proceed in discrepant areas until discrepancies have been fully resolved.

3.2 PREPARATION

- A. Close openings in exterior surfaces to protect existing work and salvage items for weather and extremes of temperature and humidity. Insulate ductwork and piping to prevent condensation in exposed areas.
- B. Cut, move or remove items as necessary for access to alterations and renovation work.
- C. Remove debris and abandoned items from area and from concealed spaces.
- D. Remove unsuitable material not marked for salvage, such as rotted wood, corroded metals, and deteriorated masonry and concrete.
- E. Prepare surface, and remove surface finishes to provide for proper installation of new work and finishes including blocking, framing, insulation, etc.
- F. Replace materials as specified for finished work.

3.3 INSTALLATION

- A. Complete Project in all respects.
- B. Remove, cut and patch work in a manner to minimize damage and to provide a means of restoring products and finishes to original condition, and installation of concealed work, as specified in Section 01 7329, Cutting and Patching,
- C. Install products as specified in individual specifications Sections.
- D. Where materials or equipment are removed, but no new finish is scheduled, patch and repair any damage to match existing wall surface.

3.4 TRANSITIONS

- A. Where new work abuts or aligns with existing, perform a smooth and even transition. Patched work is to match existing adjacent work in texture and appearance.
- B. When finished surfaces are cut so that a smooth transition with new work is not possible, terminate existing surface along a straight line at a natural point of division and make recommendation to Architect.

3.5 ADJUSTMENTS

- A. Where removal of partitions or walls results in adjacent spaces becoming one, rework floors, walls and ceilings to a smooth plane without breaks, steps or bulkheads.
- B. Where a change of plane of 1/8" or more occurs, submit recommendation for providing a smooth transition for Architect review.
- C. Fit work at penetrations of surfaces as specified in Section 01 7329.

3.6 FINISHES

- A. Finish surfaces as specified in individual Product Sections.
- B. Finish patches to produce uniform finish and texture over entire area. When finish cannot be matched, refinish entire surface to nearest intersections.

3.7 REPAIR OF DAMAGED SURFACES

- A. Patch or replace portions of existing surfaces which are damaged, lifted, discolored, or showing other imperfections.
- B. Repair substrate prior to patching finish.
- C. In the event of damage, make all repairs and replacements necessary to the approval of the Architect at no additional cost to the Owner.

ALTERATION PROJECT PROCEDURES
SECTION 01 3516
3595001

3.8 CLEANING

- A. Upon completion of installation, remove manufacturer's temporary labels and marks of identification. Thoroughly clean surfaces and remove foreign material. Leave entire work in neat, orderly, clean and acceptable condition.

3.9 PROTECTION

- A. Protect work and materials of this Section prior to and during installation, and protect the installed work and materials of other trades.
- B. Exposed finishes shall be free from scratches, dents, permanent discolorations and other defects in workmanship or material.

END OF SECTION

*p:\sacramento\3595 tracy unified school district\001-000_villalovoz es new shade structures\08 specifications\06 spec\04 final\freiler
- shade struct\01 3516 _alteration project procedures.docx
Last Updated: December 16, 2021*

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Special environmental, sustainable, and “green” building practices related to indoor air quality, resource efficiency supplementing the Pollutant Control requirements specified under Section 01 8113.10, Sustainable Design Requirements, and to ensure healthy indoor air quality in final Project.
- B. Contractor is required to comply with sustainable building practices during construction and when considering materials for substitutions. Refer to Article “Design Requirements.”

1.2 RELATED REQUIREMENTS

- A. Section 01 6116, Volatile Organic Compound (VOC) Restrictions.
- B. Section 01 7419, Construction Waste Management and Disposal.
- C. Section 01 8113, Sustainable Design Requirements.

1.3 ADMINISTRATIVE REQUIREMENTS

- A. Submittal Procedures:
 - 1. Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
 - 2. Sustainable Design Submittals shall comply with the additional requirement of Section 01 8113, Sustainable Design Requirements.
 - 3. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.

1.4 DESIGN REQUIREMENTS

- A. Owner has established general environmental goals for design and for construction of the Project.
 - 1. In addition to the Contractor, the Contractor’s construction team, including subcontractors, suppliers, and manufacturers, are encouraged to participate where possible to realize the Owner’s environmental goals.
 - 2. Intent is for environmental goals to be achieved in a manner which ultimately provides a safe and healthy environment for building occupants with minimal impact on the local, regional and global environment.
- B. Environmental Goals:
 - 1. Refer to specific Specifications Sections for more detailed construction requirements related to specific materials and systems.

ENVIRONMENTAL PROCEDURES
SECTION 01 3543
3595001

1.5 INFORMATIONAL SUBMITTALS

A. Indoor Air Quality (IAQ) Data:

1. Environmental Issues: Submit emission test data produced by acceptable testing laboratory, listed in this Specification Article "Quality Assurance," for materials as required in each specific Specification Section.
 - a. Laboratory reports shall contain emissions test data on Volatile Organic Compounds (VOCs) including Total Volatile Organic Compounds (TVOC), specific individual VOCs, formaldehyde and other aldehydes as described in this Section.
 - b. Identify VOCs emitted by each material as required in these Specifications, and demonstrate compliance with the California Green Building Standards Code, edition current as of the date of this Contract.
 - c. Specific test conditions and requirements are set forth in the Specifications. For required tests, submit documentation of sample acquisition, handling, and test specimen preparation, as well as test conditions, methods, and procedures. The tests consist of a 10-day conditioning period followed by a 96-hour test period.
 - 1) Samples collected during the test period at 24, 48, and 96-hours shall be analyzed for TVOC and formaldehyde.
 - 2) VOC samples collected at 96 hours shall be identified and quantified for compounds that are found on the list of Chemicals of Concern. The Chemicals of Concern list is based on the California OEHHA list as of September 2002 (The most recent list shall be used for this Specification as published at:
 - a) http://www.oehha.org/air/chronic_rels/allChrels.html.
2. Cleaning and Maintenance Products: Provide data on manufacturers' recommended maintenance, cleaning, refinishing and disposal procedures for materials and products. These procedures are for final Contractor cleaning of the project prior to Substantial Completion and for provided materials and products as required by the specific Specification Sections.
 - a. Where chemical products are recommended for these procedures, provide documentation to indicate that no component present in the cleaning product at more than 1 percent of the total mass of the cleaning product is a carcinogen or reproductive toxicant as identified in the Chemicals of Concern list referenced above.
 - b. Avoid cleaning products containing alpha-pinene, d-limonene or other unsaturated carbon double bond alkenes due to chemical reactions with ozone to form aldehydes, acidic aerosols, and ultra-fine particulate matter in indoor air.

B. Certificates:

1. Prior to Final Completion, submit a certificate signed by corporate office holder of Contractor, subcontractor, supplier, vendor, installer or manufacturer primarily responsible for the manufacturing of the product, indicating materials provided are

essentially the same, and contain essentially the same components as products and materials tested.

2. Comply with requirements specified in Specification Section 01 7700, Closeout Procedures.

1.6 CLOSEOUT SUBMITTALS

- A. Submit data relating to Environmental Issues.
 1. Submit environmental product certifications, in two forms:
 - a. Two CD-ROMs organized by CSI Division Format.
 - b. Three three-ring binders organized by CSI Division Format with Table of Contents and with dividers for each Division.

1.7 QUALITY ASSURANCE

- A. Environmental Project Management and Coordination: Contractor to identify one person on Contractor's staff to be responsible for environmental issues compliance and coordination.
 1. Experience: Environmental project manager shall have experience relating to sustainable building construction.
 2. Responsibilities: Carefully review the Contract Documents for environmental issues, coordinate work of trades, subcontractors, and suppliers; instruct workers relating to environmental issues; and oversee Project Environmental Goals.
 3. Meetings: Discuss Environmental Goals at following meetings.
 - a. Pre-construction meeting.
 - b. Pre-installation meetings.
 - c. Regularly scheduled job-site meetings.
 - d. Special sustainability issues meetings.
- B. Environmental Issues Criteria: Comply with requirements listed in the Specification Sections.
- C. Acceptable Indoor Air Emissions Testing Laboratories:
 1. Selection of testing laboratories shall include assessment of prior experience in conducting indoor source emissions tests.
 2. The proposed laboratory shall be an independent company or organization not related to the manufacturer of the products to be tested.
 3. Submit documentation on proposed laboratory for review and approval by Owner.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Packaging: Deliver materials in recyclable or in reusable packaging such as cardboard, wood, paper, or reusable blankets, which will be reclaimed by supplier or manufacturer for recycling.

ENVIRONMENTAL PROCEDURES

SECTION 01 3543

3595001

1. Minimize packaging materials to maximum extent possible while still ensuring protection of materials during delivery, storage, and handling.
 2. Unacceptable Packaging Materials: Polyurethane, polyisocyanate, polystyrene, polyethylene, and similar plastic materials such as “foam” plastics and “shrink-fit” plastics.
 3. Reusable Blankets: Deliver and store materials in reusable blankets and mats reclaimed by the manufacturers or suppliers for reuse where the reclamation program exists or where a program can be developed for such reuse.
 4. Pallets: Where pallets are used, suppliers shall be responsible to ensure pallets are removed from site for reuse or for recycling.
 5. Corrugated Cardboard and Paper: Where paper products are used, recycle as part of the construction waste management recycling program, or return to the material’s manufacturer for use by the manufacturer or supplier.
 6. Sealants, Paint, Primers, Adhesives, and Coating Containers: Return to the supplier or manufacturer for reuse where such program is available.
- B. Comply with the additional requirements specified in Section 01 7419, Construction Waste Management and Disposal.

1.9 FIELD CONDITIONS

- A. No smoking will be permitted in indoor Project site locations, in accordance with California Labor Code (Section 400-6413.5).
- B. Environmental Product Certification:
1. Include certification that indicates cleaning materials comply with requirements of these Specifications.
- C. Construction Ventilation and Preconditioning:
1. Temporary Construction Ventilation: Maintain sufficient temporary ventilation of areas where materials are being used that emit VOCs. Maintain ventilation continuously during installation, and until emissions dissipate following installation. If continuous ventilation is not possible utilizing the building’s HVAC system(s) then ventilation shall be supplied using open windows and temporary fans, sufficient to provide no less than three air changes per hour.
 - a. Period after installation shall be sufficient to dissipate odors and elevated concentrations of VOCs. Where no specific period is stated in these Specifications, a time period of 72 hours shall be used.
 - b. Ventilate areas directly to outside; ventilation to other enclosed areas is not acceptable.
 2. During dust producing activities, including drywall installation and finishing, turn ventilation system off, and openings in supply and return HVAC system shall be protected from dust infiltration. Provide temporary ventilation as required.
 3. Preconditioning: Prior to installation, allow products which have odors and significant VOC emissions to off-gas in dry, well-ventilated space for 14 calendar days to allow for reasonable dissipation of odors and emissions prior to delivery to Project site and installation.

- a. Condition products without containers and packaging to maximize off-gassing of VOCs
 - b. Condition products in ventilated warehouse or other building. Comply with substitution requirements for consideration of other locations.
- D. Protection:
 - 1. Moisture Stains: Materials with evidence of moisture damage, including stains, are not acceptable, including both stored and installed materials; immediately remove from site and properly dispose.
 - a. Take special care to prevent an accumulation of moisture on installed materials and within packaging during delivery, storage, and handling to prevent development of molds and mildew on packaging and on products
 - b. Immediately remove from site and properly dispose of materials showing signs of mold and signs of mildew, including materials with moisture stains.
 - c. Replace moldy materials with new, undamaged materials.
 - 2. Ducts: Seal ducts during transportation, delivery, and construction to prevent accumulation of construction dust and construction debris inside of ducts.

PART 2 - PRODUCTS

2.1 SUBSTITUTIONS

- A. Requests for substitutions shall comply with requirements specified in Specification Section 01 3300, Submittals, and with the following additional information required where environmental issues are specified:
 - 1. Indicate how each proposed substitution complies with requirements for VOCs.
 - 2. Owner, in consultation with Architect reserve the right to reject proposed substitutions where data for VOCs is not provided or where emissions of individual VOCs are higher than for the specified materials.
 - 3. Comply with the specified recycled content and other environmental requirements.

PART 3 - EXECUTION

3.1 FIELD QUALITY CONTROL

- A. Sequencing:
 - 1. On-Site Application: Where odorous and/or high VOC emitting products are applied on-site, apply prior to installation of porous and fibrous materials. Where this is not possible, protect porous materials with polyethylene vapor retarders.
 - 2. Complete interior finish material installation no less than 14 days prior to Substantial Completion to allow for Building Flush Out as described in Paragraph 3.1B.

ENVIRONMENTAL PROCEDURES

SECTION 01 3543

3595001

- B. Building Flush Out: Just prior to Substantial Completion, flush out building air continuously using maximum tempered outside air, or maximum amount of outside air while achieving reasonable indoor temperature, for at least 14 calendar days. Continuously is defined as 24 hours per day, 7 days a week. If interruptions of more than a few hours are required for testing and balancing purposes, extend flush out period accordingly in order to achieve the minimum 14 calendar day building flush out period.
 - 1. When Contractor is required to perform touch-up work, provide temporary construction ventilation during installation and extend building flush-out by a minimum of 4 calendar days after touch-up installation is complete with maximum tempered outside air for 24 hours per day.
 - 2. If construction schedule permits, extend flush-out period beyond minimum building flush out period for an additional 15 days.
 - 3. Return ventilation system to normal operation following flush-out period to minimize energy consumption.

3.2 CLEANING

- A. Clean interior and exterior surfaces exposed to view; remove temporary labels, stains, and foreign substances; polish transparent and glossy surfaces using cleaning and maintenance products that conform to standards as described in Part 1 of this Section.
- B. Clean equipment and fixtures to sanitary condition using cleaning and maintenance products that conform to standards as described in Part 1 of this Section.
- C. Products used for cleaning shall comply with Proposition 65 and the additional restrictions for volatile organic compounds specified in Section 01 6116.
- D. Vacuum carpeted and soft surfaces with high efficiency particulate arrestor (HEPA) vacuum.
- E. If ducts were not sealed during construction, and contain dust or dirt, clean ducts using HEPA vacuum immediately prior to Substantial Completion and prior to using ducts to circulate air. Oil film on sheet metal shall be removed before shipment to site. Ducts shall be inspected to confirm that no oil film is present. Remove oil film.
- F. Replace air filters, both pre and final filters, just prior to Substantial Completion.
- G. Remove and properly dispose of recyclable materials using construction waste management program described in Section 01 7419, Construction Waste Management and Disposal.

3.3 PROTECTION

- A. Protect interior materials from water intrusion or penetration where interior products are not intended for wet applications and are exposed to moisture.
- B. Protect installed products using methods that do not support growth of mold and mildew.

ENVIRONMENTAL PROCEDURES
SECTION 01 3543
3595001

1. Immediately remove from site materials with mold or mildew.

END OF SECTION

*p:\sacramento\3595 tracy unified school district\001-000_villalovoz es new shade structures\08 specifications\06 spec\04 final\freiler
- shade struct\01 3543_environmental procedures.docx*

REGULATORY REQUIREMENTS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Obtaining of Permits, Licenses and Registrations and Work to Comply with All Applicable Laws and Regulations;
- B. Special Conditions; and
- C. Quality Control.

1.02 DESCRIPTION:

This section covers the general requirements for regulatory requirements pertaining to the Work and is supplementary to all other regulatory requirements mentioned or referenced elsewhere in the Contract Documents.

1.03 REQUIREMENTS OF REGULATORY AGENCIES:

- A. All statutes, ordinances, laws, rules, codes, regulations, standards, and the lawful orders of all public authorities having jurisdiction over the Work, are hereby incorporated into these Contract Documents as if repeated in full herein and are intended to be included in any reference to Code or Building Code, unless otherwise specified, including, without limitation, the references in the list below. Contractor shall make available at the Site copies of all the listed documents applicable to the Work as the District and/or Architect may request, including, without limitation, applicable portions of the California Code of Regulations ("CCR").
 - (1) California Building Standards Administrative Code, Part 1, Title 24, CCR.
 - (2) California Building Code (CBC), Part 2, Title 24, CCR; (International Building Code volumes 1-2 and California Amendments).
 - (3) California Electrical Code (CEC), Part 3, Title 24, CCR; (National Electrical Code and California Amendments).
 - (4) California Mechanical Code (CMC), Part 4, Title 24, CCR; (Uniform Mechanical Code and California Amendments).
 - (5) California Plumbing Code (CPC), Part 5, Title 24, CCR; (Uniform Plumbing Code and California Amendments).

- (6) California Fire Code (CFC), Part 9, Title 24, CCR; (International Fire Code and California Amendments).
- (7) California Green Building Standards Code (CALGreen), Part 11, Title 24, CCR.
- (8) California Referenced Standards Code, Part 12, Title 24, CCR.
- (9) State Fire Marshal Regulations, Public Safety, Title 19, CCR.
- (10) Partial List of Applicable National Fire Protection Association (NFPA) Standards:
 - (a) NFPA 13 - Automatic Sprinkler System.
 - (b) NFPA 14 - Standpipes Systems.
 - (c) NFPA 17A - Wet Chemical System
 - (d) NFPA 24 - Private Fire Mains.
 - (e) (California Amended) NFPA 72 - National Fire Alarm Codes.
 - (f) NFPA 253 - Critical Radiant Flux of Floor Covering System.
 - (g) NFPA 2001 - Clean Agent Fire Extinguishing Systems.
- (11) California Division of the State Architect interpretation of Regulations ("DSA IR"), including, without limitation:
 - (a) DSA IR A-6 — Construction Change Document Submittal and Approval Processes.
 - (b) DSA IR A-7 — Project Inspector Certification and Approval.
 - (c) DSA IR A-8 — Project Inspector and Assistant Inspector Duties and Performance.
 - (d) DSA IR A-12 — Assistant Inspector Approval.
- (12) DSA Procedures ("DSA PR")
 - (a) DSA PR 13-01 – Construction Oversight Process
 - (b) DSA PR 13-02 – Project Certification Process

B. This Project shall be governed by applicable regulations, including, without limitation, the State of California's Administrative Regulations for the Division of the State Architect-Structural Safety (DSA/SS), Chapter 4, Part 1, Title 24, CCR, and the most current version on the date the bids are opened and as it pertains to school construction including, without limitation:

- (1) Test and testing laboratory per Section 4-335. District shall pay for the testing laboratory.
- (2) Special inspections per Section 4-333(c).
- (3) Deferred Approvals per section 4-317(g).
- (4) Verified reports per Sections 4-336 & 4-343(c).
- (5) Duties of the Architect & Engineers shall be per Sections 4-333(a) and 4-341.
- (6) Duties of the Contractor shall be per Section 4-343.
- (7) Duties of Project Inspector shall be per Section 4-334.
- (8) Addenda and Construction Change Documents per Section 4-338.

Contractor shall keep and make available all applicable parts of the most current version of Title 24 referred to in the plans and specifications at the Site during construction.

C. Items of deferred approval shall be clearly marked on the first sheet of the Architect's and/or Engineer's approved Drawings. All items later submitted for approval shall be per Title 24 requirements to the DSA.

- (1) Contractor shall submit the following to Architect for review and endorsement:
 - (a) Product information on proposed material/system supplier.
 - (b) Drawings, specifications, and calculations prepared, signed, and stamped by an architect or engineer licensed in the State of California for that portion of the Work.
 - (c) All other requirements as may be required by DSA.
- (2) Cost of preparing and submitting documentation per DSA Deferred Approval requirements including required modifications to Drawings and Specifications, whether or not indicated in the Contract Documents, shall be borne by Contractor.
- (3) Contractor shall not begin fabrication and installation of deferred approval items without first obtaining DSA approval of Drawings and Specifications.
- (4) Schedule of Work Subject to DSA Deferred Approval: Window wall systems exceeding 10 feet in span.

PART 2 – PRODUCTS Not Used.

PART 3 – EXECUTION Not Used.

END OF DOCUMENT

ABBREVIATIONS AND ACRONYMS

PART 1 – GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions including without limitation, Definitions;
- B. Special Conditions.

1.02 DOCUMENT INCLUDES:

- A. Abbreviations used throughout the Contract Documents.
- B. Reference to a technical society, organization, or body is by abbreviation, as follows:

1.	AA	The Aluminum Association
2.	AASHTO	American Association of State Highway and Transportation Officials
3.	ABPA	Acoustical and Board Products Association
4.	ACI	American Concrete Institute
5.	AGA	American Gas Association
6.	AGC	Associated General Contractors of America
7.	AHC	Architectural Hardware Consultant
8.	AHRI	Air Conditioning, Heating, Refrigeration Institute
9.	AI	Asphalt Institute
10.	AIA	American Institute of Architects
11.	AISC	American Institute of Steel Construction
12.	AISI	American Iron and Steel Institute
13.	AMCA	Air Movement and Control Association
14.	ANSI	American National Standards Institute
15.	APA	APA – The Engineered Wood Association
16.	ASCE	American Society of Civil Engineers
17.	ASHRAE	American Society of Heating, Refrigeration and Air Conditioning Engineers
18.	ASME	American Society of Mechanical Engineers
19.	ASTM	American Society of Testing and Materials International
20.	AWPA	American Wood Protection Association
21.	AWPI	American Wood Preservers Institute
22.	AWS	American Welding Society
23.	AWSC	American Welding Society Code
24.	AWI	Architectural Woodwork Institute
25.	AWWA	American Water Works Association
26.	BIA	The Brick Industry Association

27.	CCR	California Code of Regulations
28.	CLFMI	Chain Link Fence Manufacturers Institute
29.	CRA	California Redwood Association
30.	CRSI	Concrete Reinforcing Steel Institute
31.	CS	Commercial Standards
32.	CSI	Construction Specifications Institute
33.	CTI	Cooling Technology Institute
34.	FGIA	Fenestration and Glazing Industry Alliance
35.	FGMA	Flat Glass Manufacturers' Association
36.	FIA	Factory Insurance Association
37.	FM	Factory Mutual Global
38.	FS/FED SPEC	Federal Specification
39.	FTI	Facing Title Institute
40.	GA	Gypsum Association
41.	IAPMO	International Association of Plumbing and Mechanical Officials
42.	ICC	International Code Council
43.	IEEE	Institute of Electrical and Electronics Engineers
44.	IES	Illuminating Engineering Society
45.	MCAC	Mason Contractors Association of California
46.	MIMA	Mineral Wool Insulation Manufacturers Association
47.	MLMA	Metal Lath Manufacturers Association
48.	MS/MIL SPEC	Military Specifications
49.	NAAMM	National Association of Architectural Metal Manufacturers
50.	NBHA	National Builders Hardware Association
51.	NCMA	National Concrete Masonry Association
52.	NCSEA	National Council of Structural Engineers Associations
53.	NEC	National Electrical Code
54.	NEMA	National Electrical Manufacturers Association
55.	NIST	National Institute of Standards and Technology
56.	NSI	Natural Stone Institute
57.	NTMA	National Terrazzo and Mosaic Association, Inc.
58.	ORS	Office of Regulatory Services (California)
59.	OSHA	Occupational Safety and Health Act
60.	PCI	Precast/Prestressed Concrete Institute
61.	PCA	Portland Cement Association
62.	PCA	Painting Contractors Association
63.	PDI	Plumbing Drainage Institute
64.	PEI	Porcelain Enamel Institute, Inc.
65.	PG&E	Pacific Gas & Electric Company
66.	PS	Product Standards
67.	SDI	Steel Door Institute; Steel Deck Institute
68.	SJI	Steel Joist Institute
69.	SSPC	Society for Protective Coatings
70.	TCNA	Tile Council of North America, Inc.
71.	TPI	Truss Plate Institute
72.	UBC	Uniform Building Code
73.	UL	Underwriters Laboratories Code

74.	UMC	Uniform Mechanical Code
75.	USDA	United States Department of Agriculture
76.	VI	Vermiculite Institute
77.	WCLIB	West Coast Lumber Inspection Bureau
78.	WDMA	Window and Door Manufacturers Association
79.	WEUSER	Western Electric Utilities Service Engineering Requirements
80.	WIC	Woodwork Institute of California

PART 2 - PRODUCTS Not Used.

PART 3 - EXECUTION Not Used.

END OF DOCUMENT

DEFINITIONS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions including without limitation, Definitions;
- B. Special Conditions.

1.02 QUALITY ASSURANCE

- A. For products or workmanship specified by association, trade, or Federal Standards, Contractor shall comply with requirements of the standard, except when more rigid requirements are specified in the Contract Documents, or are required by applicable codes.
- B. Contractor shall conform to current reference standard publication date in effect on the date of bid opening.
- C. Contractor shall obtain copies of standards unless specifically required not to by the Contract Documents.
- D. Contractor shall maintain a copy of all standards at jobsite during submittals, planning, and progress of the specific Work, until final completion, unless specifically required not to by the Contract Documents.
- E. Should specified reference standards conflict with Contract Documents, Contractor shall request clarification from the District and/or the Architect before proceeding.
- F. The contractual relationship of the parties to the Contract shall not be altered from the contractual relationship as indicated in the Contract Documents by mention or inference otherwise in any referenced document.
- G. Governing Codes shall be as shown in the Contract Documents including, without limitation, the Specifications.

END OF DOCUMENT

REFERENCES**PART 1 - GENERAL****1.01 SCHEDULE OF REFERENCES:**

The following information is intended only for the general assistance of the Contractor, and the District does not represent that all of the information is current. It is the Contractor's responsibility to verify the correct information for each of the entities listed.

AA	The Aluminum Association 1400 Crystal Drive, Suite 430 Arlington, VA 22202 www.aluminum.org	703/358-2960
AABC	Associated Air Balance Council 2401 Pennsylvania Avenue NW, Suite 330 Washington, DC 20037 www.aabc.com	202/737-0202
AASHTO	American Association of State Highway and Transportation Officials 555 12th St. NW - Suite 1000 Washington, DC 20004 www.transportation.org	202/624-5800
AATCC	American Association of Textile Chemists and Colorists P.O. Box 12215 Research Triangle Park, NC 27709-2215 www.aatcc.org	919/549-8141
ACA	American Coatings Association 901 New York Ave., NW, Suite 300 West Washington, DC 20001 www.paint.org	202/462-6272
ACI	American Concrete Institute 38800 Country Club Dr. Farmington Hills, MI 48331-3439 www.concrete.org	248/848-3800
ACPA	American Concrete Pipe Association 5605 N. MacArthur Blvd., Suite 340 Irving, TX 75038 www.concrete-pipe.org	972/506-7216

ADC	Air Duct Council 1901 N. Roselle Road, Suite 800 Schaumburg, IL 60195 www.flexibleduct.org	847/706-6750
AF&PA	American Forest and Paper Association 1101 K Street, NW, Suite 700 Washington, DC 20005 www.afandpa.org	202/463-2700
AGA	American Gas Association 400 North Capitol Street, NW, Suite 450 Washington, DC 20001 www.aga.org	202/824-7000
AGC	Associate General Contractors of America 2300 Wilson Blvd., Suite 300 Arlington, VA 22201 www.agc.org	703/548-3118
AHA	American Hardboard Association 1210 West Northwest Highway Palatine, IL 60067 http://domensino.com/AHA/default.htm	847/934-8800
AI	Asphalt Institute 2696 Research Park Drive Lexington, KY 40511-8480 www.asphaltinstitute.org	859/288-4960
AIA	The American Institute of Architects 1735 New York Ave., NW Washington, DC 20006-5292 www.aia.org	202/626-7300
AISC	American Institute of Steel Construction 130 East Randolph Street, Suite 2000 Chicago, IL 60601 www.aisc.org	312.670.2400
AISI	American Iron and Steel Institute 25 Massachusetts Ave., NW, Suite 800 Washington, DC 20001 www.steel.org	202/452-7100
AITC	American Institute of Timber Construction 1010 South 336th Street, #210 Federal Way, WA 98003-7394 https://www.plib.org/aitc/	253/835-3344

ALI	Associated Laboratories, Inc. P.O. Box 152837 Dallas, TX 75315 www.assoc-labs.com	214/565-0593
ALSC	American Lumber Standards Committee, Inc. 7470 New Technology Way, Suite F Frederick, MD 21703 www.alsc.org	301/972-1700
AMCA	Air Movement and Control Association International, Inc. 30 W. University Drive Arlington Heights, IL 60004 www.amca.org	847/394-0150
AMPP (formerly SSPC)	Association for Materials Protection and Performance (merger of Society for Protective Coatings and National Association of Corrosion Engineers International) (formerly Steel Structures Painting Council) 800 Trumbull Drive Pittsburgh, PA 15205 www.sspc.org	412/281-2331 877/281-7772
ANLA	AmericanHort (merger of American Nursery & Landscape Association and OFA – The Association of Horticultural Professionals) 2130 Stella Court Columbus, OH 43215 www.americanhort.org	614/487-1117
ANSI	American National Standards Institute 1899 L Street, NW, 11th Floor Washington, DC 20036 www.ansi.org	202/293-8020
APA	APA-The Engineered Wood Association 7011 S. 19th Street Tacoma, WA 98466-5333 www.apawood.org	253/565-6600

APA	Architectural Precast Association 325 John Knox Rd, Suite L-103 Tallahassee, FL 32303 www.archprecast.org	850/205-5637
APCIA	American Property Casualty Insurance Association (merger of American Insurance Association (formerly the National Board of Fire Underwriters) with the Property Casualty Insurers Association of America) 555 12th St, NW, Suite 550 Washington DC 20004 www.apci.org	202/828-7100
AHRI	Air Conditioning and Refrigeration Institute (now Air- Conditioning, Heating, & Refrigeration Institute) 2311 Wilson Blvd, Suite 400 Arlington, VA 22201 www.ahrinet.org	703/524-8800
ARMA	Asphalt Roofing Manufacturers Association 2331 Rock Spring Road Forest Hill, MD 21050 www.asphaltroofing.org	443/640-1075
ASA	The Acoustical Society of America Suite 300 1305 Walt Whitman Road Melville, NY 11747-4300 https://acousticalsociety.org/	516/576-2360
ASCE	American Society of Civil Engineers 1801 Alexander Bell Drive Reston, VA 20191 www.asce.org	800/548-2723 703/295-6300
ASHRAE	American Society of Heating, Refrigerating and Air Conditioning Engineers 180 Technology Parkway Peachtree Corners, GA 30092 www.ashrae.org	800/527-4723 404/636-8400
ASLA	American Society of Landscape Architects 636 Eye Street, NW Washington, DC 20001-3736 www.asla.org	202/898-2444
ASME	American Society of Mechanical Engineers Two Park Avenue New York, NY 10016-5990 www.asme.org	800/834-2763

ASPE	American Society of Plumbing Engineers 6400 Shafer Court, Suite 350 Rosemont, IL 60018 http://aspe.org	847/296-0002
ASQ	American Society for Quality P.O. Box 3005 Milwaukee, WI 53201-3005 or 600 North Plankinton Avenue Milwaukee, WI 53203 http://asq.org	800/248-1946 414/272-8575
ASSE	American Society of Sanitary Engineering 18927 Hickory Creek Dr., Suite 220 Mokena, IL 60448 www.asse-plumbing.org	708/995-3019
ASTM	ASTM International 100 Barr Harbor Drive PO Box C700 West Conshohocken, PA, 19428-2959 www.astm.org	610/832-9500
AWCI	Association of the Wall and Ceiling Industry 513 West Broad Street, Suite 210 Falls Church, VA 22046 www.awci.org	703/538-1600
AWPA	American Wood Protection Association (formerly American Wood Preservers Institute) P.O. Box 361784 Birmingham, AL 35236-1784 www.awpa.com	205/733-4077
AWS	American Welding Society 8669 NW 36 Street, Suite 130 Miami, FL 33166 www.aws.org	800/443-9353 305/443-9353
AWI	Architectural Woodwork Institute 46179 Westlake Drive, Suite 120 Potomac Falls, VA 20165-5874 www.awinet.org	571/323-3636
AWWA	American Water Works Association 6666 West Quincy Avenue Denver, CO 80235 www.awwa.org	800/926-7337 303/794-7711

BHMA	Builders Hardware Manufacturers Association 355 Lexington Avenue, 15th Floor New York, NY 10017 www.buildershardware.com	212/297-2122
BIA	The Brick Industry Association 12007 Sunrise Valley Drive, Suite 430 Reston, VA 20191 www.gobrick.com	703/620-0010
CGA	Compressed Gas Association 8484 Westpark Drive, Suite 220 McLean, VA 22102 www.cganet.com	703/788-2700
CISCA	Ceilings & Interior Systems Construction Association 1010 Jorie Blvd, Suite 30 Oak Brook, IL 60523 www.cisca.org	630/584-1919
CISPI	Cast Iron Soil Pipe Institute 2401 Fieldcrest Dr. Mundelein, IL 60060 www.cispi.org	224/864-2910
CLFMI	Chain Link Fence Manufacturers Institute 10015 Old Columbia Road, Suite B-215 Columbia, MD 21046 chainlinkinfo.org	301/596-2583
CPA	Composite Panel Association 19465 Deerfield Avenue, Suite 306 Leesburg, VA 20176 www.compositepanel.org	703/724-1128
CPSC	Consumer Product Safety Commission 4330 East-West Highway Bethesda, MD 20814 www.cpsc.gov	800/638-2772
CRA	California Redwood Association 818 Grayson Road, Suite 201 Pleasant Hill, CA 94523 www.calredwood.org	925/935-1499

CRI	Carpet and Rug Institute 100 S. Hamilton Street Dalton, GA 30722-2048 www.carpet-rug.org	706/278-3176
CRSI	Concrete Reinforcing Steel Institute 933 N. Plum Grove Road Schaumburg, IL 60173-4758 www.crsi.org	847/517-1200
CSI	The Construction Specifications Institute 123 North Pitt St, Suite 450 Alexandria, VA 22314 www.csinet.org	800/689-2900
CTIOA	Ceramic Tile Institute of America 12061 Jefferson Blvd. Culver City, CA 90230-6219 www.ctioa.org	310/574-7800
DHA	Decorative Hardwoods Association (formerly Hardwood Plywood & Veneer Association) 42777 Trade West Dr. Sterling, VA 20166 https://www.decorativehardwoods.org/	703/435-2900
DHI	Door and Hardware Institute (formerly National Builders Hardware Association) 2001 K Street NW, 3rd Floor North Washington, DC 20006 www.dhi.org	202/367-1134
DIPRA	Ductile Iron Pipe Research Association P.O. Box 190306 Birmingham, AL 35219 www.dipra.org	205/402-8700
DOC	U.S. Department of Commerce 1401 Constitution Ave., NW Washington, DC 20230 www.commerce.gov	202/482-2000
DOT	U.S. Department of Transportation 1200 New Jersey Avenue, SE Washington, DC 20590 www.dot.gov	855/368-4200
EJMA	Expansion Joint Manufacturers Association, Inc. 25 North Broadway Tarrytown, NY 10591 www.ejma.org	914/332-0040

EPA	Environmental Protection Agency Ariel Rios Building 1200 Pennsylvania Avenue, N.W. Washington, DC 20460 www.epa.gov	202/272-0167
FCICA	Floor Covering Installation Contractors Association 800 Roosevelt Rd., Bldg. C, Suite 312 Glen Ellyn, IL 60137 www.fcica.com	630/672-3702
FGIA	Fenestration and Glazing Industry Alliance 1900 E Golf Rd, Suite 1250 Schaumburg, IL 60173 https://fgiaonline.org/	847/303-5664
FM Global	Factory Mutual Insurance Company Amy Daley Global Practice Leader – Education, Public Entities, Health Care FM Global 270 Central Avenue Johnston, RI 02919-4949 www.fmglobal.com	401/275-3000 401/275-3029
FS	General Services Administration (GSA) Index of Federal Specifications, Standards and Commercial Item Descriptions 470 East L'Enfant Plaza, SW, Suite 8100 Washington, DC 20407 www.gsa.gov	202/619-8925
GA	The Gypsum Association 962 Wayne Ave., Suite 620 Silver Spring, MD 20910 www.gypsum.org	301/277-8686
HMA	Hardwood Manufacturers Association One Williamsburg Place, Suite 108 Warrendale, PA 15086 http://hmamembers.org	412/244-0440

IAPMO	International Association of Plumbing and Mechanical Officials (formerly the Western Plumbing Officials Association) 4755 E. Philadelphia St. Ontario, CA 91761 www.iapmo.org	909/472-4100
ICC	International Code Council 500 New Jersey Avenue, NW, 6th Floor Washington, DC 20001 www.iccsafe.org	888/422-7233
IEEE	Institute of Electrical and Electronics Engineers 3 Park Avenue, 17th Floor New York, NY 10016-5997 www.ieee.org	212/419-7900
IES	Illuminating Engineering Society 120 Wall Street, Floor 17 New York, NY 10005-4001 www.ies.org	212/248-5000
ITRK	Intertek Testing Services 3933 US Route 11 Cortland, NY 13045 www.intertek.com	607/753-6711
MCAA	Mechanical Contractors Association of America 1385 Piccard Drive Rockville, MD 20850 www.mcaa.org	301/869-5800
MMPA (formerly WMMPA)	Moulding & Millwork Producers Association (formerly Wood Moulding & Millwork Producers Association) 507 First Street Woodland, CA 95695 www.wmmpa.com	530/661-9591 800/550-7889
MSS	Manufacturers Standardization Society (MSS) of the Valve and Fittings Industry, Inc. 127 Park Street, NE Vienna, VA 22180-4602 http://mss-hq.org	703/281-6613
NAAMM	National Association of Architectural Metal Manufacturers 800 Roosevelt Rd. Bldg. C, Suite 312 Glen Ellyn, IL 60137 www.naamm.org	630/942-6591

NAIMA	North American Insulation Manufacturers Association P.O. Box 1906 Alexandria, VA 22313 https://insulationinstitute.org/	703/684-0084
NALP	National Association of Landscape Professionals (formerly Professional Landcare Network) 12500 Fair Lakes Circle, Suite 200 Fairfax, VA 22033 https://www.landscapeprofessionals.org/	703/736-9666
NAPA	National Asphalt Pavement Association 6406 Ivy Lane, Suite 350 Greenbelt, MD 20770-1441 www.asphaltpavement.org	888/468-6499 301/731-4748
NCSPA	National Corrugated Steel Pipe Association 14070 Proton Road, Suite 100 Dallas, TX 75244 www.ncspa.org	972/850-1907
NCMA	National Concrete Masonry Association 13750 Sunrise Valley Drive Herndon, VA 20171-4662 www.ncma.org	703/713-1900
NEBB	National Environmental Balancing Bureau 8575 Grovemont Circle Gaithersburg, MD 20877 www.nebb.org	301/977-3698
NECA	National Electrical Contractors Association 1201 Pennsylvania Ave. NW Washington, D.C., 20004 www.necanet.org	202/991-6300
NEMA	National Electrical Manufacturers Association 1300 North 17th Street N, Suite 900 Rosslyn, VA 22209 www.nema.org	703/841-3200
NEII	National Elevator Industry, Inc. 5537 SW Urish Road Topeka, KS 66610 https://nationalelevatorindustry.org/	703/589-9985
NFPA	National Fire Protection Association 1 Batterymarch Park Quincy, MA 02169-7471 www.nfpa.org	800/344-3555 855/274-8525

NGA (formerly GANA)	National Glass Association (merged with Glass Association of North America) 1945 Old Gallows Road Suite 750 Vienna, VA 22182 www.glass.org	866/342-5642 Ext 127
NHLA	National Hardwood Lumber Association PO Box 34518 Memphis, TN 38184 www.nhla.com	901/377-1818
NIA	National Insulation Association 516 Herndon Pkwy., Ste. D Herndon, VA 20170 www.insulation.org	703/464-6422
NRCA	National Roofing Contractors Association 10255 W. Higgins Road, Suite 600 Rosemont, IL 60018-5607 www.nrca.net	847/299-9070
NSF	NSF International 789 N. Dixboro Road Ann Arbor, MI 48113-0140 www.nsf.org	800/673-6275 734/769-8010
NSI	Natural Stone Institute (formerly Marble Institute of America) 380 E. Lorain St. Oberlin, OH 44074 https://www.naturalstoneinstitute.org/	440/250-9222
NTMA	National Terrazzo and Mosaic Association 209 N. Crockett Street, Suite 2 PO Box 2605 Fredericksburg, TX 78624 www.ntma.com	800/323-9736
OSHA	Occupational Safety and Health Act U.S. Department of Labor Occupational Safety & Health Administration 200 Constitution Ave., NW Washington, DC 20210 www.osha.gov	800/321-OSHA (6742)

PCA	Portland Cement Association 5420 Old Orchard Road Skokie, IL 60077 or 200 Massachusetts Ave NW, Suite 200 Washington, DC 20001 www.cement.org	847/966-6200 202/408-9494
PCA	Painting Contractors Association (formerly Painting and Decorating Contractors of America) 2316 Millpark Drive Maryland Heights, MO 63043 https://www.pcapainted.org/	800/322-7322
PCI	Precast/Prestressed Concrete Institute 8770 W. Bryn Mawr Ave., Suite 1150 Chicago, IL 60631 www.pci.org	312/786-0300
PDI	Plumbing & Drainage Institute 800 Turnpike Street, Suite 300 North Andover, MA 01845 http://pdionline.org	978/557-0720 800/589-8956
PEI	Porcelain Enamel Institute, Inc. P.O. Box 920220 Norcross, GA 30010 www.porcelainenamel.com	770/676-9366
PG&E	Pacific Gas & Electric Company P.O. Box 997300 Sacramento, CA 95899-7300 www.pge.com	800/743-5000
PLIB	Pacific Lumber Inspection Bureau (formerly West Coast Lumber Inspection Bureau) 1010 South 336th Street, Suite 210 Federal Way, WA 98003-7394 https://www.plib.org/	253/835-3344
RFCI	Resilient Floor Covering Institute 115 Broad Street, Suite 201 La Grange, GA 30240 www.rfci.com	706/882-3833
SDI	Steel Deck Institute P.O. Box 426 Glenshaw, PA 15116 www.sdi.org	412/487-3325

SDI	Steel Door Institute 30200 Detroit Road Westlake, OH 44145 www.steeldoor.org	440/899-0010
SJI	Steel Joist Institute 140 West Evans Street, Suite 203 Florence, SC 29501 http://steeljoist.org	843/407-4091
SMA	Stucco Manufacturers Association 5753 E Santa Ana Cyn Rd, #G-156 Anaheim, CA 92807 www.stuccomfgassoc.com	714/473-9579
SMACNA	Sheet Metal and Air Conditioning Contractors' National Association 4201 Lafayette Center Drive Chantilly, VA 20151-1219 www.smacna.org	703/803-2980
SPI	SPI: The Plastics Industry Trade Association, Inc. 1425 K St. NW, Suite 500 Washington, DC 20005 www.plasticsindustry.org	202/974-5200
TCA	The Tile Council of North America 100 Clemson Research Blvd. Anderson, SC 29625 www.tcnatile.com	864/646-8453
TPI	Truss Plate Institute 2670 Crain Highway, Suite 203 Waldorf, MD 20601 www.tpinst.org	240/587-5582
TPI	Turfgrass Producers International 444 E. Roosevelt Road #346 Lombard, IL 60148 www.turfgrasssod.org	800/405-8873 847/649-5555
TCIA	Tree Care Industry Association (formerly the National Arborist Association) 670 N Commercial Street, Suite 201 Manchester, NH 03101 www.tcia.org	603/314-5380 800/733-2622

TVI	The Vermiculite Institute c/o The Schundler Company 10 Central Street Nahant, MA 01908 www.vermiculiteinstitute.org	732/287-2244
UL	Underwriters Laboratories Inc. 333 Pfingsten Road Northbrook, IL 60062-2096 www.ul.com	847/272-8800 877/854-3577
UNI	Uni-Bell PVC Pipe Association 201 E. John Carpenter Freeway, Suite 750 Irving, TX 75062 www.uni-bell.org	972/243-3902
USDA	U.S. Department of Agriculture 1400 Independence Ave., S.W. Washington, DC 20250 www.usda.gov	202/720-2791
WA	Wallcoverings Association 35 E Wacker Dr., Suite 850 Chicago, IL 60601 www.wallcoverings.org	312/224-2574
WCMA	Window Covering Manufacturers Association 355 Lexington Avenue 15th Floor New York, NY 10017 www.wcmanet.org	212/297-2122
WDMA	Window & Door Manufacturers Association 2001 K Street NW, 3rd Floor North Washington, D.C. 20006 www.wdma.com	202/367-1157
WI	Woodwork Institute 1455 Response Road, Suite 110 Sacramento, CA 95815 www.wicnet.org	916/372-9943
WRI	Wire Reinforcement Institute 942 Main Street, Suite 300 Hartford, CT 06103 www.wirereinforcementinstitute.org	860/240-9545
WWCA	Western Wall & Ceiling Contractors Association 1910 N. Lime St. Orange, CA 92865 www.wwcca.org	714/221-5520

WWPA	Western Wood Products Association (formerly Redwood Inspection Service) 1500 SW First Ave., Suite 870 Portland, OR 97201 www.wwpa.org	503/224-3930
------	--	--------------

PART 2 - PRODUCTS Not Used.

PART 3 - EXECUTION Not Used.

END OF DOCUMENT

MATERIALS AND EQUIPMENT

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Purchase of Materials and Equipment;
- B. Special Conditions;
- C. Imported Materials Certification.

1.02 MATERIAL AND EQUIPMENT

- A. Only items approved by the District and/or Design Professional shall be used.
- B. Contractor shall submit lists of products and other product information in accordance with the Contract Documents, including, without limitation, the provisions regarding the submittals.

1.03 MATERIAL AND EQUIPMENT COLORS

- A. The District and/or Architect will provide a schedule of colors.
- B. No individual color selections will be made until after approval of all pertinent materials and equipment and after receipt of appropriate samples in accordance with the Contract Documents, including, without limitation, the provisions regarding the submittals.
- C. Contractor shall request priority in writing for any item requiring advance ordering to maintain the approved Construction Schedule.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. Contractor shall deliver manufactured materials in original packages, containers, or bundles (with seals unbroken), bearing name or identification mark of manufacturer.
- B. Contractor shall deliver fabrications in as large assemblies as practicable; where specified as shop-primed or shop-finished, package or crate as required to preserve such priming or finish intact and free from abrasion.
- C. Contractor shall store materials in such a manner as necessary to properly protect them from damage. Materials or equipment damaged by handling, weather, dirt, or from any other cause will not be accepted.

- D. Materials are not acceptable that have been warehoused for long periods of time, stored or transported in improper environment, improperly packaged, inadequately labeled, poorly protected, excessively shipped, deviated from normal distribution pattern, or reassembled.
- E. Contractor shall store material so as to cause no obstructions of sidewalks, roadways, access to the Site or buildings, and underground services. Contractor shall protect material and equipment furnished under Contract.
- F. Contractor may store materials on Site with prior written approval by the District, all material shall remain under Contractor's control and Contractor shall remain liable for any damage to the materials. Should the Project Site not have storage area available, the Contractor shall provide for off-site storage at a bonded warehouse and with appropriate insurance coverage at no cost to District.
- G. When any room in Project is used as a shop or storeroom, the Contractor shall be responsible for any repairs, patching, or cleaning necessary due to that use. Location of storage space shall be subject to prior written approval by District.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Manufacturers listed in various sections of Contract Documents are names of those manufacturers that are believed to be capable of supplying one or more of items specified therein.
- B. The listing of a manufacturer does not imply that every product of that manufacturer is acceptable as meeting the requirements of the Contract Documents.

2.02 FACILITIES AND EQUIPMENT

Contractor shall provide, install, maintain, and operate a complete and adequate facility for handling, the execution, disposal, and distribution of material and equipment as required for proper and timely performance of Work connected with Contract.

2.03 MATERIAL REFERENCE STANDARDS

Where material is specified solely by reference to "standard specifications" and if requested by District, Contractor shall submit for review data on actual material proposed to be incorporated into Work of Contract listing name and address of vendor, manufacturer, or producer, and trade or brand names of those materials, and data substantiating compliance with standard specifications.

PART 3 - EXECUTION

3.01 WORKMANSHIP

- A. Where not more specifically described in any other Contract Documents, workmanship shall conform to methods and operations of best standards and accepted practices of trade or trades involved and shall include items of fabrication, construction, or installation regularly furnished or required for completion (including finish and for successful operation, as intended).
- B. Work shall be executed by tradespersons skilled in their respective lines of Work. When completed, parts shall have been durably and substantially built and present a neat appearance.

3.02 COORDINATION

- A. Contractor shall coordinate installation of Work so as to not interfere with installation of others. Adjustment or rework because of Contractor's failure to coordinate will be at no additional cost to District.
- B. Contractor shall examine in-place work for readiness, completeness, fitness to be concealed or to receive other work, and in compliance with Contract Documents. Concealing or covering Work constitutes acceptance of additional cost which will result should in-place Work be found unsuitable for receiving other Work or otherwise deviating from the requirements of the Contract Documents.

3.03 COMPLETENESS

Contractor shall provide all portions of the Work, unless clearly stated otherwise, installed complete and operational with all elements, accessories, anchorages, utility connections, etc., in manner to assure well-balanced performance, in accordance with manufacturer's recommendations and by Contract Documents. Terms such as "installed complete," "operable condition," "for use intended," "connected to all utilities," "terminate with proper cap," "adequately anchored," "patch and refinish," "to match similar," should be assumed to apply in all cases, except where completeness of functional or operable condition is specifically stated as not required.

3.04 APPROVED INSTALLER OR APPLICATOR

Installation by a manufacturer's approved installer or applicator is an understood part of Specifications and only approved installer or applicator is to provide on-site Work where specified manufacturer has on-going program of approving (i.e. certifying, bonding, re-warranting) installers or applicators. Newly established relationships between a manufacturer and an installer or applicator who does not have other approved applicator work in progress or completed is not approved for this Project.

3.05 MANUFACTURER'S RECOMMENDATIONS

All installations shall be in accordance with manufacturer's published recommendations and specific written directions of manufacturer's representative.

Should Contract Documents differ from recommendations of manufacturer or directions of his representative, Contractor shall analyze differences, make recommendations to the District and the Architect in writing, and shall not proceed until interpretation or clarification has been issued by the District and/or the Architect.

END OF DOCUMENT

QUALITY CONTROL

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Inspector, Inspections and Tests, Uncovering of Work and Non-conforming of Work and Correction of Work;
- B. Special Conditions.

1.02 RELATED CODES:

- A. The Work is governed by requirements of Title 24, California Code of Regulations ("CCR"), and the Contractor shall keep a copy of these available at the job Site for ready reference during construction.
- B. The Division of the State Architect ("DSA") shall be notified at or before the start of construction.

1.03 OBSERVATION AND SUPERVISION:

- A. The District and Architect or their appointed representatives will review the Work and the Contractor shall provide facilities and access to the Work at all times as required to facilitate this review. Administration by the Architect and any consulting Structural Engineer will be in accordance with applicable regulations, including, without limitation, CCR, Part 1, Title 24, Section 4-341.
- B. One or more Project Inspector(s) approved by DSA and employed by or in contract with the District, referred to hereinafter as the "Project Inspector", will observe the work in accordance with CCR, Part 1, Title 24, Sections 4-333(b) and 4-342:
 - (1) The Project Inspector and Special Inspector(s) shall have access to the Work wherever it is in preparation or progress for ascertaining that the Work is in accordance with the Contract Documents and all applicable code sections. The Contractor shall provide facilities and operation of equipment as needed, and access as required and shall provide assistance for sampling or measuring materials.
 - (2) The Project Inspector will notify the District and Architect and call the attention of the Contractor to any observed failure of Work or material to conform to Contract Documents.

The Contractor shall conform with all applicable laws as indicated in the Contract Documents, including, without limitation, to CCR, Part 1, Title 24, Section 4-343.

The Contractor shall supervise and direct the Work and maintain a competent superintendent on the job who is authorized to act in all matters pertaining to the Work. The Contractor's superintendent shall also inspect all materials, as they arrive, for compliance with the Contract Documents. Contractor shall reject defective Work or materials immediately upon delivery or failure of the Work or material to comply with the Contract Documents. The Contractor shall submit verified reports as indicated in the Contract Documents, including, without limitation, the Specifications and as required by Part 1, Title 24, Section 4-336.

1.04 TESTING AGENCIES:

- A. Testing agencies and tests shall be in conformance with the General Documents and the requirements of Part 1, Title 24, Section 4- 335.
- B. Testing and inspection in connection with earthwork shall be under the direction of the District's consulting soils engineer, if any, referred to hereinafter as the "Soils Engineer."
- C. Testing and inspection of construction materials and workmanship shall be performed by a qualified laboratory, referred to hereinafter as the "Testing Laboratory." The Testing Laboratory shall be under direction of an engineer registered in the State of California, shall conform to requirements of ASTM E329, and shall be employed by or in contract with the District.
- D. Testing laboratory shall be approved by the Architect and the Division of the State Architect.
- E. Owner will employ and pay for services of an independent testing labatory to perform specified inspection and testing. Retesting cost for failed test will be Contractors responsibilityand will be back-charged against the contract.

1.05 TESTS AND INSPECTIONS:

- A. The Contractor shall be responsible for notifying the District and Project Inspector of all required tests and inspections. Contractor shall notify the District and Project Inspector at least seventy-two hours (72) hours in advance of performing any Work requiring testing or inspection.
- B. The Contractor shall provide access to Work to be tested and furnish incidental labor, equipment, and facilities to facilitate all inspections and tests.
- C. The District will pay for first inspections and tests required by the "CCR", and other inspections or tests that the District and/or the Architect may direct to have made, including the following principal items:
 - (1) Tests and observations for earthwork and paving.
 - (2) Tests for concrete mix designs, including tests of trial batches.
 - (3) Tests and inspections for structural steel work.
 - (4) Field tests for framing lumber moisture content.

- (5) Additional tests directed by the District that establish that materials and installation comply with the Contract Documents.
 - (6) Tests and observations of welding and expansion anchors.
- D. The District may at its discretion, pay and then back charge the Contractor for:
 - (1) Retests or reinspections, if required, and tests or inspections required due to Contractor error or lack of required identifications of material.
 - (2) Uncovering of work in accordance with Contract Documents.
 - (3) Testing done on weekends, holidays, and overtime will be chargeable to the Contractor for the overtime portion.
 - (4) Testing done off Site.
- E. Testing and inspection reports and certifications:
 - (1) If initially received by Contractor, Contractor shall provide to each of the following a copy of the agency or laboratory report of each test or inspection or certification.
 - (a) The District;
 - (b) The Construction Manager, if any;
 - (c) The Architect;
 - (d) The Consulting Engineer, if any;
 - (e) Other engineers on the Project, as appropriate;
 - (f) The Project Inspector; and
 - (g) The Contractor.
 - (2) When the test or inspection is one required by the CCR, a copy of the report shall also be provided to the DSA.

1.06 LABORATORY REPORTS

- A. After each inspection and test, promptly submit two copies of laboratory report to Owner, Architect, Contractor and DSA.
- B. Include:
 - (1) Date of issue,
 - (2) DSA Application and File numbers,
 - (3) Project title and number,

- (4) Name of inspector,
- (5) Date and time of sampling or inspection,
- (6) Identification of product and Specification Section,
- (7) Location in the Project,
- (8) Type of inspection or test,
- (9) Date of test,
- (10) Results of test,
- (11) Conformance with Contract Documents.

C. When requested by Architect, provide interpretation of test results.

1.07 LIMITS ON TESTING LABORATORY AUTHORITY

- A. Laboratory may not release, revoke, alter or enlarge on requirements of Contract Documents.
- B. Laboratory may not approve or accept any portion of the work.
- C. Laboratory may not assume any duties of Contractor.
- D. Laboratory has no authority to stop the work.

PART 2 - PRODUCTS

2.01 TYPE OF TEST AND INSPECTIONS

- A. Testing and inspection shall be in accordance with DSA Form 103 (or current version)
- B. Slump Test
ASTM C 143
- C. Concrete Tests

Testing agency shall test concrete used in the work per the following paragraphs:

- (1) Compressive Strength:
 - (a) Minimum number of tests required: One (1) set of three (3) cylinders for each 100 cubic yards (Sec. 2604(h) 01) of concrete or major fraction thereof, placed in one (1) day. See Title 24, Section 2605(g).

- (b) Two cylinders of each set shall be tested at twenty-eight (28) days. One (1) cylinder shall be held in reserve and tested only when directed by the Architect or District.
- (c) Concrete shall test the minimum ultimate compressive strength in twenty-eight 28 days, as specified on the structural drawings.
- (d) In the event that the twenty-eight (28) day test falls below the minimum specified strength, the effective concrete in place shall be tested by taking cores in accordance with UBC Standard No. 26-13 and tested as required for cylinders.
- (e) In the event that the test on core specimens falls below the minimum specified strength, the concrete will be deemed defective and shall be removed and replaced upon such direction of the Architect, and in a manner acceptable to the Division of the State Architect.

D. Reinforcing, Steel

PART 3 - EXECUTION Not Used.

END OF DOCUMENT

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Administrative and procedural requirements related to inspections, tests, and related quality control procedures required to be performed by the Contractor and that facilitate the Contractor's compliance with the Contract Documents.

1.2 RELATED REQUIREMENTS

- A. Section 01 3300, Submittal Procedures; submission of manufacturers' instructions and certificates.
- B. Section 01 4523, Testing and Inspecting Services, and DSA 103; Special Tests and Inspections required by authorities having jurisdiction and are the responsibility of Owner.
- C. Section 01 7700, Closeout Procedures.
- D. Specific requirements for testing, inspections, mockups, and other quality control requirements as described in the various Sections of the Specifications.

1.3 DEFINITIONS

- A. Experienced: When used with an entity or individual, and unless otherwise specified, means having successfully completed a minimum of three previous projects similar in nature, size, and extent to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.
- B. Field Quality-Control Tests: Tests and inspections that are performed on-site for installation of the Work and for completed Work.
- C. Installer/Applicator/Erector: Contractor or another entity engaged by Contractor as an employee, subcontractor, or sub-subcontractor, to perform a particular construction operation, including installation, erection, application, assembly, and similar operations.
- D. Mockups: Full-size, physical assemblies that are constructed on-site and in-place mockups to demonstrate aesthetic effects and, where indicated, qualities of materials and execution, and to review construction, coordination, interface, testing, and operation of various building components. Mockups are not samples.
- E. Tests: Procedures intended to establish the quality, performance, or reliability of a product or system conducted by a qualified Testing Agency.
- F. Source Quality-Control Tests: Tests and inspections related to materials manufactured or fabricated away from the jobsite that will be incorporated into the work.

FIELD QUALITY CONTROL PROCEDURES
SECTION 01 4516
3595001

- G. Testing Agency: An independent entity engaged to perform specific tests, inspections, or both, is qualified to operate in California, and meets the additional requirements specified.
 - 1. Testing laboratory shall mean the same as Testing Agency.
- H. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.
- I. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that actual products incorporated into the Work and completed construction comply with requirements. Contractor's quality-control services do not include Contract administration activities performed by Architect.

1.4 REFERENCES AND STANDARD SPECIFICATIONS

- A. General:
 - 1. The Contract Documents contain references to various standard specifications, codes, practices, and requirements for materials, work quality, installation, inspections, and tests published and issued by the organizations, societies, and associations.
 - 2. Contractor shall obtain its own copies of required specified referenced publications.
 - 3. The specification or standard referred to shall have full force and effect as though printed in these Specifications.
 - 4. When the effective date of a reference standard is not specified, it shall be understood that the current edition or latest revision thereof and any amendments or supplements thereto in effect on the date of the DSA approval, shall govern the Work.
 - 5. The contractual relationships, duties, and responsibilities of the parties in Contract or those of the Architect shall not be altered from the Contract Documents by mention or inference otherwise in any reference document.
- B. Products or workmanship specified by association, trade, or other consensus standards shall comply with requirements of the referenced standard or specification except when more rigid requirements are specified or are required by applicable codes.
- C. Conflicting Requirements:
 - 1. If compliance with two or more standards or requirements are specified and the standards or requirements establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement.
 - 2. Refer conflicting requirements that are different, but apparently equal, to Architect for direction before proceeding.

1.5 ADMINISTRATIVE REQUIREMENTS

- A. Submittal Procedures:
 - 1. Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
 - 2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.

1.6 INFORMATIONAL SUBMITTALS

- A. Schedule of Tests and Inspections.
- B. Field Superintendent's Quality Control Responsibilities
- C. Procedures for inspection prior to subsequent Work or cover up.
- D. Qualifications of Contractor's Testing Agencies.
- E. Certified copies of Reports and Documents.

1.7 CLOSEOUT SUBMITTALS

- A. Permits, Licenses, and Certificates: Copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents established for compliance with standards and regulations bearing on performance of the Work.
- B. Test and Inspection Log including final record for each test and inspection as specified in Part 3 and in accordance with Section 01 7839, Project Record Documents.

1.8 REPORTS AND DOCUMENTS

- A. Test and Inspection Reports: Prepare and submit certified written reports where specified in the Specification Sections. Include the following:
 - 1. Date of issue.
 - 2. Project title and number.
 - 3. Name, address, and telephone number of testing agency.
 - 4. Dates and locations of samples and tests or inspections.
 - 5. Names of individuals making tests and inspections.
 - 6. Description of the Work and test and inspection method.
 - 7. Identification of product and Specification Section.
 - 8. Complete test or inspection data.
 - 9. Test and inspection results and an interpretation of test results.
 - 10. Record of temperature and weather conditions at time of sample taking and testing and inspecting.

FIELD QUALITY CONTROL PROCEDURES
SECTION 01 4516
3595001

11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
12. Name and signature of laboratory inspector.
13. Recommendations on retesting and re-inspecting.

1.9 QUALITY ASSURANCE

- A. Minimum Quantity or Quality Levels:
1. The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements.
 2. Refer uncertainties to Architect for a decision before proceeding.
- B. Use of trade-specific terminology in referring to a trade or entity does not require that certain construction activities be performed by accredited or unionized individuals, or that requirements specified apply exclusively to specific trade(s).
- C. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce Work of specified quality.
- D. Correct conditions or workmanship not in conformance with specified standards or quality. Do so immediately after non-conformance item is discovered or within a reasonable time frame agreed upon with Construction Manager.
- E. Comply with manufacturers' instructions, including each step in sequence. Should manufacturers' instructions conflict with Contract Documents, request clarification from the Architect before proceeding.
- F. Comply with specified standards as minimum quality for the Work, except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.
- G. Perform Work by persons qualified to produce required and specified quality.
- H. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, or disfigurement.
- I. Upon delivery to the jobsite, materials and products shall be inspected for compliance with the Project Specifications.
1. Nonconforming materials, products, equipment, hardware, tools and/or safety devices shall be removed immediately from the general work area and stored within a secured area approved by the Owner as "NON CONFORMING MATERIALS AREA" to ensure that defective or nonconforming materials are not incorporated into or used on the project
 2. Materials or products shall not be removed from the designated area until they are deemed by the Architect to be in compliance, or until they are modified or fixed to

meet the project specifications, or until they are removed from the jobsite for the purposes of disposal or shipment back to the manufacturer.

1.10 CONTRACTORS TESTING AGENCY

- A. Qualifications: At Contractor's expense, provide an independent testing laboratory nationally recognized according to 29 CFR 1910.7 and accredited according to NIST's National Voluntary Laboratory Accreditation Program (NVLAP,) or other independent agency with the experience and capability to conduct testing and inspecting indicated, documented according to ASTM E329; with additional qualifications specified in individual Sections; and, where required, that is acceptable to authorities having jurisdiction.
- B. Testing Agency shall cooperate with Architect, Construction Manager, Owner's Project Inspector, and Contractor in performance of duties.
- C. Testing Agency shall provide qualified personnel to perform required tests and inspections.
- D. Testing Agency shall not be authorized to release, revoke, alter, or increase the Contract Document requirements, approve or accept any portion of the Work, or perform any duties of Contractor.

1.11 TESTS AND INSPECTIONS

- A. Preconstruction Testing: Where preconstruction testing is specified to verify performance requirements, comply with the following as applicable:
 - 1. Contractor Responsibilities:
 - a. Provide test specimens representative of proposed products and construction.
 - b. Submit specimens in a timely manner with sufficient time for testing and analyzing results to prevent delaying the Work.
 - c. Provide sizes and configurations of test assemblies, mockups, and laboratory mockups to adequately demonstrate capability of products to comply with performance requirements.
 - d. Build site-assembled test assemblies and mockups using installers who will perform same tasks for Project.
 - e. Build laboratory mockups at testing facility using personnel, products, and methods of construction indicated for the completed Work.
 - f. When testing is complete, remove test specimens, assemblies, and mockups; do not reuse products on Project unless approved by Architect in writing.
- B. Tests and Inspections indicated in individual Specification Sections shall be conducted by a qualified Testing Agency. The responsibilities of the Testing Agency shall be as follows:

FIELD QUALITY CONTROL PROCEDURES
SECTION 01 4516
3595001

1. Verifying that manufacturer maintains detailed fabrication and quality-control procedures and reviews the completeness and adequacy of those procedures to perform the Work.
 2. Notifying Architect, Construction Manager, Owner's Project Inspector, and Contractor promptly of irregularities and deficiencies observed in the Work during performance of its services.
 3. Submit a certified written report of each test, inspection, and similar quality-control service to Architect, Construction Manager, and Owner's Project Inspector with copy to Contractor and to DSA.
 4. Submit a final report of tests and inspections at Substantial Completion which includes a list of unresolved deficiencies.
 5. Interpret tests and inspections and stating in each report whether tested and inspected work complies with or deviates from the Contract Documents.
 6. Retest and reinspect corrected work.
- C. Monitoring and Documentation: Contractor shall maintain testing and inspection reports including log of approved and rejected results as specified in Part 3.
1. Include work Architect has indicated as nonconforming or defective.
 2. Indicate corrective actions taken to bring nonconforming work into compliance with requirements.
 3. Comply with requirements of the California Division of the State Architect (DSA).

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 NOTIFICATIONS

- A. Contractor shall provide the following notifications;
1. Owner's Project Inspector writing:
 - a. 24 hours in advance of starting new Work
 - b. 24 hours in advance of each test or inspection
 2. 48 hours' prior notice, minimum, to the Testing Agency for required tests and inspections.

3.2 TEST AND INSPECTION FIELD BINDER

- A. Contractor shall maintain in the Field Office a Test and Inspection Field Binder that includes a hard copy of the following documents:
1. Approved Quality Control Plan.
 2. Specification Sections that apply to the respective portions of work.
 3. RFI's, CCD's or other approved document that changes the work.

4. Manufacturer's Installation Instructions (MII).
5. Specific details of the Work as requested by the Inspector.
6. Test and Inspection Log.

3.3 TEST AND INSPECTION LOG

- A. Prepare and maintain a record of tests and inspections using an electronic spreadsheet.
- B. Include the following information:
 1. Date test or inspection was conducted.
 2. Description of the Work tested or inspected.
 3. List pertinent detail/sheet number.
 4. List pertinent Specification Section.
 5. Attach manufacturer's installation inspections if applicable.
 6. List and attach RFI's, ASI's or CCD's affecting the Work.
 7. Date Inspector verified work is acceptable.
- C. Final record for each test and inspection shall be submitted on Contractors letterhead and include the name of the responsible person to verify Work was in accordance with the approved Contract Documents.

3.4 MANUFACTURERS' FIELD SERVICES

- A. When specified in respective Specification Sections, Contractor shall require supplier or manufacturer to provide qualified personnel to observe field conditions, conditions of surfaces and installation, quality of workmanship, start-up of equipment, testing, adjusting and balancing of equipment as applicable, and to make appropriate recommendations. Contractor is responsible for proper notification of manufacturer's representative before installation of applicable work and for obtaining necessary inspection certificate stating that installation was observed and approved.
- B. Product Performance Verification: The supplier of products specified based on performance criteria shall, at the request of the Agency, inspect the installed product and certify conformance of the product to specified criteria under the installed conditions.
- C. Manufacturer's representative shall submit written report to the Architect listing observations and recommendations.

3.5 TOLERANCES - GENERAL

- A. Monitor tolerance control of installed products or portions to produce acceptable Work. Do not permit tolerances to accumulate.
- B. Comply with manufacturers' tolerances. Should manufacturers' tolerances conflict with Contract Documents, request clarification from Architect before proceeding.
- C. Adjust products to appropriate dimensions; position before securing products in place.

FIELD QUALITY CONTROL PROCEDURES
SECTION 01 4516
3595001

3.6 DIMENSIONING AND TOLERANCES FOR ACCESSIBILITY

- A. While it is recognized that construction practices generally permit a level of reasonable dimensional tolerance, the installation of items subject to compliance with the Americans with Disabilities Act Accessibility Guidelines and Chapter 11B of the California Building Code, typically does not allow such tolerances. Therefore, these dimensions are to be considered absolute and will be strictly enforced. Items found to be out of tolerance may require modification and/or replacement at Contractor's expense.

3.7 REPAIR AND PROTECTION

- A. On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.
 - 1. Provide materials and comply with installation requirements specified in other Specification Sections or matching existing substrates and finishes.
 - 2. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible. Comply with the Contract Document requirements for cutting and patching in Section 01 7329, Cutting and Patching.
- B. Protect construction exposed by or for quality-control service activities.
- C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

END OF SECTION

p:\sacramento\3595 tracy unified school district\001-000_villalovoz es new shade structures\08 specifications\06 spec\04 final\freiler - shade struct\01 4516_field quality control procedures.docx
Last Updated: August 28, 2020

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Requirements for Testing Laboratory.
 - 2. Contractor's responsibilities for facilitation of Testing and Inspections.

1.2 RELATED SECTIONS AND DOCUMENTS

- A. Geologic Hazards & Soils Report.
- B. DSA 103 - Structural Test & Inspections List.
- C. Section 13 3423, Relocatable Buildings.
- D. Division 23, Mechanical Work - Testing, adjusting, and balancing of systems.
- E. Section 31 0000, Earthwork.
- F. Individual Specification Sections: Inspections and tests required, and standards for testing.

1.3 REFERENCES

- A. California Administrative Code (CAC), edition as noted on the drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Building Code (CBC), edition as noted on the drawings, as adopted by the California Division of the State Architect (DSA).

1.4 SELECTION AND PAYMENT

- A. Testing laboratory shall be approved by both the Architect and the Division of the State Architect.
- B. Owner will employ and pay for services of an independent testing laboratory to perform specified inspection and testing. Retesting costs for failed tests will be the Contractors responsibility and will be back-charged against the contract.
- C. Under provisions for Relocatable Building construction, Owner limits his exposure to in-plant inspection and testing costs. Refer to other Specification Sections related to such specific construction.
- D. Employment of testing laboratory shall in no way relieve Contractor of obligation to perform work in accordance with requirements of Contract Documents.

TESTING AND INSPECTION SERVICES

SECTION 01 4523

3595001

1.5 LABORATORY REPORTS

- A. After each inspection and test, promptly submit two copies of laboratory report to Owner, Architect, Contractor and DSA.
- B. Include:
 - 1. Date of issue,
 - 2. DSA Application and File numbers,
 - 3. Project title and number,
 - 4. Name of inspector,
 - 5. Date and time of sampling or inspection,
 - 6. Identification of product and Specification Section,
 - 7. Location in the Project,
 - 8. Type of inspection or test,
 - 9. Date of test,
 - 10. Results of test,
 - 11. Conformance with Contract Documents.
- C. When requested by Architect, provide interpretation of test results.

1.6 LIMITS ON TESTING LABORATORY AUTHORITY

- A. Laboratory may not release, revoke, alter or enlarge on requirements of Contract Documents.
- B. Laboratory may not approve or accept any portion of the work.
- C. Laboratory may not assume any duties of Contractor.
- D. Laboratory has no authority to stop the work.

1.7 CONTRACTOR RESPONSIBILITIES

- A. Deliver to laboratory at designated location, adequate samples of materials proposed to be used which require testing, along with proposed mix designs. Allow reasonable time for review and testing.
- B. Arrange for, and coordinate with, laboratory for all required testing and inspection. Provide adequate notice, in advance, for proper scheduling and processing of testing. The Inspector will not be responsible for scheduling or arranging for testing and inspection services.
- C. Cooperate with laboratory personnel, and provide access to the work and to manufacturer's facilities.
- D. Provide incidental labor and facilities to provide access to work to be tested, to obtain and handle samples at the site or at the source of products to be tested, to facilitate tests and inspections, storage and curing of test samples.

TESTING AND INSPECTION SERVICES

SECTION 01 4523

3595001

- E. Notify Architect, Inspector, Structural Engineer (when applicable) and laboratory 24 hours prior to expected time for operations requiring inspection and testing services.

END OF SECTION

*p:\sacramento\3595 tracy unified school district\001-000_villalovoz es new shade structures\08 specifications\06 spec\04 final\freiler
- shade struct\01 4523_testing and inspection services.docx
Last Updated: December 16, 2021*

TEMPORARY FACILITIES AND CONTROLS

PART 1 – GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions;
- B. Special Conditions;
- C. Site Standards; and
- D. Construction Waste Management and Disposal.

1.02 TEMPORARY UTILITIES:

- A. Electric Power and Lighting:
 - (1) Contractor will pay for power during the course of the Work. To the extent power is available in the building(s) or on the Site, Contractor may use the District's existing utilities by making prearranged payments to the District for the utilities used by Contractor and all Subcontractors. Contractor shall be responsible for providing temporary facilities required to deliver that power service from its existing location in the building(s) or on the Site to point of intended use.
 - (2) Contractor shall verify characteristics of power available in building(s) or on the Site. Contractor shall take all actions required to make modifications where power of higher voltage or different phases of current are required. Contractor shall be fully responsible for providing that service and shall pay all costs required therefor.
 - (3) Contractor shall furnish, wire for, install, and maintain temporary electrical lights wherever it is necessary to provide illumination for the proper performance and/or observation of the Work: a minimum of 20 foot-candles for rough work and 50 foot-candles for finish work.
 - (4) Contractor shall be responsible for maintaining existing lighting levels in the project vicinity should temporary outages or service interruptions occur.
- B. Water:
 - (1) Contractor shall pay for water used during the course of the Work. Contractor shall coordinate and pay for installation or use of water meter in compliance with local water agency requirements. To the

extent water is then available in the building(s) or on the Site, Contractor may use the District's existing utilities by making prearranged payments to the District for the utilities used by Contractor and all Subcontractors. Contractor shall be responsible for providing temporary facilities required to deliver such utility service from its existing location in the building(s), on the Site, or other location approved by the local water agency, to point of intended use.

- (2) Contractor shall use backflow preventers on water lines at point of connection to District's water supply. Backflow preventers shall comply with requirements of Uniform Plumbing Code.
- (3) Contractor shall make potable water available for human consumption.

C. Sanitary Facilities:

- (1) Contractor shall provide sanitary temporary facilities in no fewer numbers than required by law and such additional facilities as may be directed by the Inspector for the use of all workers. The facilities shall be maintained in a sanitary condition at all times and shall be left at the Site until removal is directed by the Inspector or Contractor completes all other work at the Site.
- (2) Use of toilet facilities in the Work under construction shall not be permitted except by consent of the Inspector and the District.

D. Fire Protection:

- (1) Contractor shall provide and maintain fire extinguishers and other equipment for fire protection. Such equipment shall be designated for use for fire protection only and shall comply with all requirements of the California Fire, State Fire Marshall and/or its designee.
- (2) Where on-site welding and burning of steel is unavoidable, Contractor shall provide protection for adjacent surfaces.

E. Trash Removal:

- (1) Contractor shall provide trash removal on a timely basis. Under no circumstance shall Contractor use District trash service.

F. Field Office:

- (1) If Contractor chooses to provide a field office, it shall be an acceptable construction trailer that is well-lit and ventilated. The construction trailer shall be equipped with shelves, desks, filing cabinet, chairs, and such other items of equipment needed. Trailer and equipment are the property of the Contractor and must be removed from the Site upon completion of the Work.
- (2) Contractor shall provide any additional electric lighting and power required for the trailer. Contractor shall make adequate provisions for heating and cooling as required.

1.03 CONSTRUCTION AIDS:

- A. Plant and Equipment:
 - (1) Contractor shall furnish, operate, and maintain a complete plant for fabricating, handling, conveying, installing, and erecting materials and equipment; and for conveyances for transporting workers. Include elevators, hoists, debris chutes, and other equipment, tools, and appliances necessary for performance of the Work.
 - (2) Contractor shall maintain plant and equipment in safe and efficient operating condition. Damages due to defective plant and equipment, and uses made thereof, shall be repaired by Contractor at no expense to the District.
- B. None of the District's tools and equipment shall be used by Contractor for the performance of the Work.

1.04 BARRIERS AND ENCLOSURES:

- A. Contractor shall obtain the District's written permission for locations and types of temporary barriers and enclosures, including fire-rated materials proposed for use, prior to their installation.
- B. Contractor shall provide and maintain temporary enclosures to prevent public entry and to protect persons using other buildings and portions of the Site and/or Premises, the public, and workers. Contractor shall also protect the Work and existing facilities from the elements, and adjacent construction and improvements, persons, and trees and plants from damage and injury from demolition and construction operations.
- C. Contractor shall provide site access to existing facilities for persons using other buildings and portions of the Site, the public, and for deliveries and other services and activities.
- D. Tree and Plant Protection:
 - (1) Contractor shall preserve and protect existing trees and plants on the Premises that are not designated or required to be removed, and those adjacent to the Premises.
 - (2) Contractor shall provide barriers to a minimum height of 4'-0" around drip line of each tree and plant, around each group of trees and plants, as applicable, in the proximity of demolition and construction operations, or as denoted on the Plans.
 - (3) Contractor shall not park trucks, store materials, perform Work or cross over landscaped areas. Contractor shall not dispose of paint thinners, water from cleaning, plastering or concrete operations, or other deleterious materials in landscaped areas, storm drain systems, or sewers. Plant materials damaged as a result of the performance of the Work shall, at the option of the District and at Contractor's expense, either be replaced with new plant materials equal in size to

those damaged or by payment of an amount representing the value of the damaged materials as determined by the District.

- (4) Contractor shall remove soil that has been contaminated during the performance of the Work by oil, solvents, and other materials which could be harmful to trees and plants, and replace with good soil, at Contractor's expense.
- (5) Excavation around Trees:
 - (a) Excavation within drip lines of trees shall be done only where absolutely necessary and with written permission from the District.
 - (b) Where trenching for utilities is required within drip lines, tunneling under and around roots shall be by hand digging and shall be approved by the District. Main lateral roots and taproots shall not be cut. All roots 2 inches in diameter and larger shall be tunneled under and heavily wrapped with wet burlap so as to prevent scarring or excessive drying. Smaller roots that interfere with installation of new work may be cut with prior approval by the District. Roots must first be cut with a Vermeer, or equivalent, root cutter prior to any trenching.
 - (c) Where excavation for new construction is required within drip line of trees, hand excavation shall be employed to minimize damage to root system. Roots shall be relocated in backfill areas wherever possible. If encountered immediately adjacent to location of new construction, roots shall be cut approximately 6 inches back from new construction.
 - (d) Approved excavations shall be carefully backfilled with the excavated materials approved for backfilling. Backfill shall conform to adjacent grades without dips, sunken areas, humps, or other surface irregularities. Do not use mechanical equipment to compact backfill. Tamp carefully using hand tools, refilling and tamping until Final Acceptance as necessary to offset settlement.
 - (e) Exposed roots shall not be allowed to dry out before permanent backfill is placed. Temporary earth cover shall be provided, or roots shall be wrapped with four layers of wet, untreated burlap and temporarily supported and protected from damage until permanently relocated and covered with backfill.
 - (f) Accidentally broken roots should be sawed cleanly 3 inches behind ragged end.

1.05 SECURITY:

The Contractor shall be responsible for project security for materials, tools, equipment, supplies, and completed and partially completed Work.

1.06 TEMPORARY CONTROLS:

A. Noise Control:

- (1) Contractor acknowledges that adjacent facilities may remain in operation during all or a portion of the Work period, and it shall take all reasonable precautions to minimize noise as required by applicable laws and the Contract Documents.
- (2) Notice of proposed noisy operations, including without limitation, operation of pneumatic demolition tools, concrete saws, and other equipment, shall be submitted to the District a minimum of forty-eight (48) hours in advance of their performance.

B. Noise and Vibration:

- (1) Equipment and impact tools shall have intake and exhaust mufflers.
- (2) Contractor shall cooperate with District to minimize and/or cease the use of noisy and vibratory equipment if that equipment becomes objectionable by its longevity.

C. Dust and Dirt:

- (1) Contractor shall conduct demolition and construction operations to minimize the generation of dust and dirt, and prevent dust and dirt from interfering with the progress of the Work and from accumulating in the Work and adjacent areas including, without limitation, occupied facilities.
- (2) Contractor shall periodically water exterior demolition and construction areas to minimize the generation of dust and dirt.
- (3) Contractor shall ensure that all hauling equipment and trucks carrying loads of soil and debris shall have their loads sprayed with water or covered with tarpaulins, and as otherwise required by local and state ordinance.
- (4) Contractor shall prevent dust and dirt from accumulating on walks, roadways, parking areas, and planting, and from washing into sewer and storm drain lines.

D. Water:

- (1) Contractor shall not permit surface and subsurface water, and other liquids, to accumulate in or about the vicinity of the Premises. Should accumulation develop, Contractor shall control the water or other liquid, and suitably dispose of it by means of temporary pumps, piping, drainage lines, troughs, ditches, dams, or other methods.

E. Pollution:

- (1) No burning of refuse, debris, or other materials shall be permitted on or in the vicinity of the Premises.
- (2) Contractor shall comply with applicable regulatory requirements and anti-pollution ordinances during the conduct of the Work including, without limitation, demolition, construction, and disposal operations.

F. Lighting:

- (1) If portable lights are used after dark, all light must be located so as not to direct light into neighboring property.

1.07 PUBLICITY RELEASES:

- A. Contractor shall not release any information, story, photograph, plan, or drawing relating information about the Project to anyone, including press and other public communications medium, including, without limitation, on website(s) without the written permission of the District.

PART 2 – PRODUCTS Not used.

PART 3 – EXECUTION Not used.

END OF DOCUMENT

CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions;
- B. Special Conditions; and
- C. Temporary Facilities and Controls.

1.02 SECTION INCLUDES:

- A. Administrative and procedural requirements for the following:
 - (1) Salvaging non-hazardous construction waste.
 - (2) Recycling non-hazardous construction waste.
 - (3) Disposing of non-hazardous construction waste.

1.03 DEFINITIONS:

- A. Construction Waste: Building and site improvement materials and other solid waste resulting from construction, remodeling, renovation, or repair operations. Construction waste includes packaging.
- B. Demolition Waste: Building and site improvement materials resulting from demolition or selective demolition operations.
- C. Disposal: Removal off-site of demolition and construction waste and subsequent sale, recycling, reuse, or deposit in landfill or incinerator acceptable to authorities having jurisdiction.
- D. Recycle: Recovery of demolition or construction waste for subsequent processing in preparation for reuse.
- E. Salvage: Recovery of demolition or construction waste and subsequent sale or reuse in another facility.
- F. Salvage and Reuse: Recovery of demolition or construction waste and subsequent incorporation into the Work.

1.04 PERFORMANCE REQUIREMENTS:

- A. General: Develop waste management plan that results in end-of Project rates for salvage/recycling of sixty-five percent (65%) by weight (or by volume, but not a combination) of total waste generated by the Work.

1.05 SUBMITTALS:

- A. Waste Management Plan: Submit waste management plan within 30 days of date established for commencement of the Work.
- B. Waste Reduction Progress Reports: Concurrent with each Application for Payment, submit copies of report. Include the following information:
 - (1) Material category.
 - (2) Generation point of waste.
 - (3) Total quantity of waste in tons or cubic yards.
 - (4) Quantity of waste salvaged, both estimated and actual in tons or cubic yards.
 - (5) Quantity of waste recycled, both estimated and actual in tons or cubic yards.
 - (6) Total quantity of waste recovered (salvaged plus recycled) in tons or cubic yards.
 - (7) Total quantity of waste recovered (salvaged plus recycled) as a percentage of total waste.
- C. Waste Reduction Calculations: Before request for final payment, submit copies of calculated end-of-Project rates for salvage, recycling, and disposal as a percentage of total waste generated by the Work.
- D. Records of Donations: Indicate receipt and acceptance of salvageable waste donated to individuals and organizations. Indicate whether organization is tax exempt.
- E. Records of Sales: Indicate receipt and acceptance of salvageable waste sold to individuals and organizations. Indicate whether organization is tax exempt.
- F. Recycling and Processing Facility Records: Indicate receipt and acceptance of recyclable waste by recycling and processing facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.
- G. Landfill and Incinerator Disposal Records: Indicate receipt and acceptance of waste by landfills and incinerator facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.

- H. Qualification Data: For Waste Management Coordinator.
- I. Submittal procedures and quantities are specified in Document 01 33 00.

1.06 QUALITY ASSURANCE:

- A. Waste Management Coordinator Qualifications: LEED Accredited Professional by U.S. Green Building Council.
- B. Regulatory Requirements: Comply with hauling and disposal regulations of authorities having jurisdiction.
- C. Waste Management Conference: Conduct conference at Project site to comply with requirements. Review methods and procedures related to waste management including, but not limited to, the following:
 - (1) Review and discuss waste management plan including responsibilities of Waste Management Coordinator.
 - (2) Review requirements for documenting quantities of each type of waste and its disposition.
 - (3) Review and finalize procedures for materials separation and verify availability of containers and bins needed to avoid delays.
 - (4) Review procedures for periodic waste collection and transportation to recycling and disposal facilities.
 - (5) Review waste management requirements for each trade.

1.07 WASTE MANAGEMENT PLAN:

- A. General: Develop plan consisting of waste identification, waste reduction work plan, and cost/revenue analysis. Indicate quantities by weight or volume, but use same units of measurement throughout waste management plan.
- B. Waste Identification: Indicate anticipated types and quantities of site-clearing and construction waste generated by the Work. Include estimated quantities and assumptions for estimates.
- C. Waste Reduction Work Plan: List each type of waste and whether it will be salvaged, recycled, or disposed of in landfill or incinerator. Include points of waste generation, total quantity of each type of waste, quantity for each means of recovery, and handling and transportation procedures.
 - (1) Salvaged Materials for Reuse: For materials that will be salvaged and reused in this Project, describe methods for preparing salvaged materials before incorporation into the Work.

- (2) Salvaged Materials for Sale: For materials that will be sold to individuals and organizations, include list of their names, addresses, and telephone numbers.
- (3) Salvaged Materials for Donation: For materials that will be donated to individuals and organizations, include list of their names, addresses, and telephone numbers.
- (4) Recycled Materials: Include list of local receivers and processors and type of recycled materials each will accept. Include names, addresses, and telephone numbers.
- (5) Disposed Materials: Indicate how and where materials will be disposed of. Include name, address, and telephone number of each landfill and incinerator facility.
- (6) Handling and Transportation Procedures: Include method that will be used for separating recyclable waste including sizes of containers, container labeling, and designated location on Project site where materials separation will be located.

PART 2 - PRODUCTS Not Used.

PART 3 - EXECUTION

3.01 PLAN IMPLEMENTATION:

- A. General: Implement approved waste management plan. Provide handling, containers, storage, signage, transportation, and other items as required to implement waste management plan during the entire duration of the Contract.
 - (1) Comply with Document 01 50 00 for operation, termination, and removal requirements.
- B. Training: Train workers, subcontractors, and suppliers on proper waste management procedures, as appropriate for the Work occurring at Project site.
 - (1) Distribute waste management plan to everyone concerned within 3 days of submittal return.
 - (2) Distribute waste management plan to entities when they first begin work on site. Review plan procedures and locations established for salvage, recycling, and disposal.
- C. Site Access and Temporary Controls: Conduct waste management operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.

- (1) Designate and label specific areas of Project site necessary for separating materials that are to be salvaged, recycled, reused, donated, and sold.
- (2) Comply with Document 01 50 00 for controlling dust and dirt, environmental protection, and noise control.

3.02 RECYCLING CONSTRUCTION WASTE:

- A. General: Recycle paper and beverage containers used by on-site workers.
- B. Recycling Incentives: Revenues, savings, rebates, tax credits, and other incentives received for recycling waste materials shall accrue to the Contractor.
- C. Procedures: Separate recyclable waste from other waste materials, trash, and debris. Separate recyclable waste by type at Project site to the maximum extent practical.
 - (1) Provide appropriately marked containers or bins for controlling recyclable waste until they are removed from Project Site. Include list of acceptable and unacceptable materials at each container and bin.
 - (a) Inspect containers and bins for contamination and remove contaminated materials if found.
 - (2) Stockpile processed materials on site without intermixing with other materials. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
 - (3) Stockpile materials away from construction area. Do not store within drip line of remaining trees.
 - (4) Store components off the ground and protect from the weather.
 - (5) Remove recyclable waste off District property and transport to recycling receiver or processor.
- D. Packaging:
 - (1) Cardboard and Boxes: Break down packaging into flat sheets. Bundle and store in a dry location.
 - (2) Polystyrene Packaging: Separate and bag material.
 - (3) Pallets: As much as possible, require deliveries using pallets to remove pallets from Project Site. For pallets that remain on Site, break down pallets into component wood pieces and comply with requirements for recycling wood.
 - (4) Crates: Break down crates into component wood pieces and comply with requirements for recycling wood.

- E. Site-Clearing Wastes: Chip brush, branches, and trees on site.
- F. Wood Materials:
 - (1) Clean Cut-Offs of Lumber: Grind or chip into small pieces.
 - (2) Clean Sawdust: Bag sawdust that does not contain painted or treated wood.

3.03 DISPOSAL OF WASTE:

- A. General: Except for items or materials to be salvaged, recycled, or otherwise reused, remove waste materials from Project Site and legally dispose of them in a landfill or incinerator acceptable to authorities having jurisdiction.
 - (1) Except as otherwise specified, do not allow waste materials that are to be disposed of accumulate on site.
 - (2) Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
- B. Burning: Do not burn waste materials.
- C. Disposal: Transport waste materials off District property and legally dispose of them.

END OF DOCUMENT

FIELD OFFICES

PART 1 – GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions;
- B. Special Conditions; and
- C. Temporary Facilities and Controls.

1.02 SECTION INCLUDES:

- A. Requirements for Field Offices and Field Office Trailers.

1.03 SUMMARY:

- A. General: Contractor shall provide District's Field Office Trailer and contents, for District's use exclusively, during the term of the Contract.
- B. Property: Trailer, furniture, furnishings, equipment, and the like, supplied by the Contractor with the Office Trailer shall remain the property of the Contractor; District property items installed, delivered, and the like by District within the Office Trailer will remain District's property.
- C. Modifications: District reserves the right to modify the trailer or contents, or both, as may be deemed proper by District.
- D. Condition: Trailer and contents shall be clean, neat, substantially finished, in good, proper, and safe condition for use, operation, and the like; the trailer and contents shall not be required to be new.
- E. Installation Timing: Provide safe, fully furnished, functional, proper, complete, and finished trailer properly ready for entire use, within fourteen (14) calendar days of District's notification of the issuance of Notice to Proceed.

1.04 SUBMITTALS:

- A. General: Submit submittals to District in quantity, format, type, and the like, as specified herein.
- B. Office Trailer Data: One (1) copy of manufacturer's descriptive data, technical descriptions, regulatory compliance, industry standards, installation, removal, and maintenance instructions.

- C. Equipment Data: Two (2) copies of manufacturer data for each type of equipment, if directed by District.
- D. Furniture and Furnishings Data: Two (2) copies of manufacturer data for each type of equipment, if directed by District.
- E. Plans: One (1) reproducible copy of appropriately scaled plans of trailer layout. Plans shall include, but not be limited to: lighting; furniture; equipment; telephone and electrical outlets; and the like.
- F. Product Samples: One (1) complete and entire unit of each type, if directed by District.

1.05 QUALITY ASSURANCE

- A. Standards: In the event that provisions of codes, regulations, safety orders, Contract Documents, referenced manufacturer's specifications, manufacturer's instructions, industry standards, and the like, are in conflict, the more restrictive and higher quality shall govern.
- B. Installer: Installer or Installers engaged by Contractor must have a minimum of five (5) years of documented and properly authenticated successful experience of specialization in the installation of the items or systems, or both, specified herein.
- C. Manufacturer: Contractor shall obtain products from nationally and industry recognized Manufacturer with five (5) years minimum, of immediately recent, continuous, documented and properly authenticated successful experience of specialization in the manufacture of the product specified herein.
- D. State Personnel Training: Provide proper training for maintenance and operations, including emergency procedures, and the like, as directed by District.
- E. Units: Shall be sound and free of defects, and shall not include any damage or defect that will impair the safety, installation, performance, or the durability of the entire Office Trailer and appurtenant systems.

1.06 REGULATORY REQUIREMENTS

- A. General: Work shall be executed in accordance with applicable Codes, Regulations, Statutes, Enactments, Rulings, Laws, each authority having jurisdiction, and including, but not limited to, Regulatory Requirements specified herein.
- B. California Building Standards Code ("CBSC").
- C. California Code of Regulations, Title 25, Chapter 3, Sub Chapter 2, Article 3 ("CCR").
- D. Coach Insignia: Trailer shall display California Commercial Coach Insignia; such insignia shall be deemed to show that the trailer is in accordance with the Construction and Fire Safety requirements of CCR.

PART 2 – PRODUCTS

2.01 FIELD OFFICE TRAILER

- A. General: Provide entire Field Office Trailer of type, function, operation, capacity, size, complete with controls, safety devices, accessories, and the like, for proper and durable installation. Partitions, walls, ceiling, and other interior and exterior surfaces shall be appropriately finished, including, but not limited to, trim, painting, wall base, floor covering, suspended or similar ceiling, and the like; provide systems, components, units, nuts, bolts, screws, anchoring devices, fastening devices, washers, accessories, adhesives, sealants, and other items of type, grade, and class required for the particular use, not identified but required for a complete, weather-tight, appropriately operating, and finished installation.
- B. Manufacturers: General Electric Capital Modular Space; The Space Place, Inc.; or equal.
- C. Program: Provide a wheel-mounted trailer with stairs, landings, platforms, ramps, and the like, in good, proper, safe, clean, and properly finished condition; with proper heavy duty locks, and other proper and effective security at all doors, windows, and the like. Trailer shall be maintained in good, proper, safe, clean, and properly finished condition during the Contract.
 - (1) Nominal Trailer Size: Four hundred eighty (480) square feet, minimum.
 - (2) Stairs, Platform: Properly finished stairs, platforms, and ramps.
 - (3) Doors: Two (2), three (3) foot wide exterior doors with locksets; finished ramp, steps, and entry platform at each exterior door.
 - (4) Keys: Submit five (5) keys for each door, window, furniture unit, and the like. There shall be no other key copies or originals available; each key shall be identified for District; and shall be labeled, or tagged
 - (5) Lighting: Sixty-five (65) foot-candles illumination minimum at any point, at thirty (30) inches above finished floor throughout from fluorescent light source, exclusively, or as directed by District.
 - (6) Electrical Outlets: One (1) duplex outlet evenly spaced every twelve (12) linear horizontal feet of wall face, and electrical service ready for use.

2.02 FIELD OFFICE TRAILER ITEMS

- A. General: Provide the Field Office Trailer with the following arranged into two (2) workstations:
 - (1) Desks: Two (2) desks: thirty-six (36) inches by sixty (60) inches; steel, laminated plastic top; locking, one (1) or two (2) file drawers single pedestal; steel; provide five (5) keys to District.

- (2) Tables: Two (2) tables; thirty-six (36) inches by sixty (60) inches; twenty-nine (29) inches high; steel, laminated plastic top tables; one (1) at each desk.
 - (3) Chairs: Two (2) chairs: swivel; steel; with seat cushion and arms; one (1) at each desk.
 - (4) Waste Baskets: Two (2) waste baskets, one at each desk.
- B. Furniture and Equipment: Provide in the space located to effect efficient and logical use.
- (1) File cabinet: One (1); four (4) drawer; lateral; steel locking.
 - (2) Plan Table: One (1) plan table: thirty-six (36) inches deep by seventy-two (72) inches wide by forty-two (42) inches high; adjustable; wood or steel; with lockable plan and pencil drawers.
 - (3) Drafting Stool: One (1) drafting stool; swiveling; steel; padded; adjustable; with footrest and casters.
 - (4) Bookshelf: One (1) bookshelf: thirty-six (36) inches deep by seventy-two (72) inches wide by forty-two (42) inches high; adjustable; wood or steel; with lockable plan and pencil drawer.
 - (5) Plan Rack: One (1) wheel mounted plan rack.
 - (6) Waste Baskets: One (1) large waste basket.
 - (7) Coat/Hat Hanger: Wall mounted with minimum capacity for four (4) garments and ten (10) hats.
 - (8) Document Management System: Shall include an integrated high-volume printer, copier, and facsimile machine, including stand, base, and storage cabinet; and shall include the following features:
 - (a) Type: Laser, dry electrostatic transfer, plain paper, digital, multi-function imaging system.
 - (b) Network: Ethernet or Token Ring network ready, Plug-and-Play.
 - (c) Print, send/receive facsimile from any connected workstation.
 - (d) Resolution: Six hundred (600) dots per inch by six hundred (600) dots per inch, minimum.
 - (e) Print Speed: Twenty (20) pages per minute, minimum.
 - (f) Copies: Twenty (20) copies per minute, minimum.
 - (g) Document Handler: Forty (40) sheet, minimum

- (h) Collator: Forty (40) bin, minimum, with stapling.
- (i) Duplexing: Capable.
- (j) Paper Size: Capable of handling paper sizes to eleven (11) inches by seventeen (17) inches.
- (k) Paper Cassettes: One (1) each for eight and one half (8.5) inches by eleven (11) inches, eight and one half (8.5) inches by fourteen (14) inches, and eleven (11) inches by seventeen (17) inches paper sizes; minimum two hundred fifty (250) sheets per cassette.
- (l) Reduction/Enlargement: Capable of reduction to twenty-five percent (25%) and enlargement to two hundred percent (200%).
- (m) Facsimile Electronic Storage: Capable of storing minimum of fifty (50) speed dial numbers, group faxing and broadcast faxing.
- (n) Facsimile Scanning: Capable of scanning into memory a minimum of one hundred (100) pages with maximum scan time of three (3) seconds per page.
- (o) Halftone: Sixty-four (64) levels.
- (p) Redial: Automatic and Manual.
- (9) Maintenance: Contractor shall purchase service agreements for each unit of equipment for the duration of the project plus two (2) months, and shall maintain all equipment in proper working condition. Service agreements shall include provision for replacement of toner cartridges and other items required to effect proper unit use. Service agreements shall also provide for:
 - (a) Unlimited Service Calls.
 - (b) Same Day Response.
 - (c) All parts, labor, preventative maintenance and mileage.
 - (d) All chemicals, such as toner, fixing agent, and the like.
 - (e) System training and setup.
- (10) Portable Toilets: Two (2); each shall include a urinal; each unit shall be a properly enclosed chemical unit conforming to ANSI Z4.3.
 - (a) Location: As directed by District.
 - (b) Maintenance: Maintain each unit and surrounding areas in a clean, hygienic and orderly manner, at all time. Empty, clean,

and sanitize each unit each day at a location and time as directed by District.

- (c) Removal: Relocate, or remove from the site, each Portable Toilet. Upon such directive by District, the Contractor shall forthwith relocate or remove each Portable Toilet and submit the affected areas to a condition which existed prior to the installation of each Portable Toilet, within three (3) calendar days, or as directed by District in writing, at no cost to District.

2.03 UTILITY AND SERVICES

- A. Telephone Service: Contractor shall provide and interface the entire telephone service, and shall properly and timely pay for telephone service for District's non-long-distance use.
- B. Electrical Service: Provide all proper connections and continuously pay for service for the duration of the Work.

2.04 FINISHES

- A. General: Manufacturer standard finish system over surfaces properly cleaned, pretreated, and prepared to obtain proper bond; all visible surfaces shall be coated.
- B. Finish: Color as selected by District from manufacturer standard palette.

PART 3 – EXECUTION

3.01 INSTALLATION

- A. General: Properly prepare area and affected items to receive the Work. Set Work accurately in location, alignment, and elevation; rigidly, securely, and firmly anchor to appropriate structure; install plumb, straight, square, level, true, without racking, rigidly anchored to proper solid blocking, substrate, and the like; provide appropriate type and quantity of reinforcements, fasteners, adhesives, self-adhesive and other tapes; lubricants, coatings, accessories, and the like, as required for a complete, structurally rigid, stable, sound, and appropriately finished installation, in accordance with manufacturer's published instructions, and as indicated. The more restrictive and higher quality requirement shall govern. Moving parts shall be properly secured, without binding, looseness, noise, and the like.
- B. Installation: Install in accordance with 25 CCR 3.2.3 and as directed by District; jack up trailer and level both ways; mount on proper concrete piers with all load off wheels; provide required tie down and accessories per Section 4368 of referenced CCR, and as directed by District.
- C. Rejected Work: Work, materials, unit, items, systems, and the like, not accepted by District shall be deemed rejected, and shall forthwith be removed and replaced with proper and new Work, materials, unit, items, systems, and the like at no cost to District.

- D. Standard: Comply with manufacturer's published instructions, or with instructions as shown or indicated; the more restrictive and higher quality requirement shall govern.
- E. Location: As directed by District.
- F. Fire Resistance: Construct and install in accordance with UL requirements.
- G. Maintenance: Contractor shall maintain trailer and adjacent areas in a safe, clean and hygienic condition throughout the duration of the Work, and as directed by District. Properly repair or replace furniture or other items, as directed by District. Properly remove unsafe, damaged, or broken furniture, or similar items, and replace with safe and proper items. Contractor shall pay cost of all services, repair, and maintenance, or replacement of each item.
- H. Janitorial Service: Provide professional janitorial services, including, but not limited to, trash, waste paper baskets, fill paper dispensers; clean and dust all furniture, files, and the like; sweep and mop resilient and similar flooring; and vacuum carpeting and similar flooring.
 - (1) Frequency: Two (2) times per week, minimum.
- I. Removal: Properly remove the Office Trailer and contents from the Site upon completion of the Contract, or as directed by District in writing. Forthwith properly patch and repair affected areas; replace damaged items with new items. Carefully and properly inventory, clean, pack, store, and protect District property; submit District property to District at a date, time and location as directed by District.

END OF DOCUMENT

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Protection for existing trees.
 - 2. Repair and replacement of damaged trees.

1.2 RELATED REQUIREMENTS

- A. Section 32 8000, Irrigation.
- B. Section 32 9000, Landscaping.

1.3 REFERENCES AND STANDARDS

- A. American National Standard Institute (ANSI) A300 Pruning Standards.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Submittal Procedures:
 - 1. Action Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
 - 2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.

1.5 ACTION SUBMITTALS

- A. Fenced Tree Protection Area Plan: Submit plan outlining trees listed by number to be protected and their groupings. Trees shall be grouped in their own Fenced Tree Protection Areas as shown in Drawings.
- B. Schedule of Activities Inside Tree Protection Area: Submit in writing a schedule, including any and all activity inside Fenced Tree Protection Areas. This schedule to include but not limited to the dates fences are initially installed, altered and dates of fence replacement. Intent of these provisions is that the Tree Protection Zones (TPZ) are fenced for the entire duration with only exceptions of short intervals or specifically defined construction activity needs. Revise schedule as directed.
- C. Mediation Plan: Submit mediation plan to keep existing trees and planting irrigated during construction.

1.6 CLOSEOUT SUBMITTALS

- A. Maintenance Plan: For replaced trees.

TEMPORARY TREE PROTECTION
SECTION 01 5639
3595001

PART 2 - PRODUCTS

2.1 GENERAL

- A. Use materials as specified; any deviation from the Specifications must first be approved by the Owner's Representative in writing.

2.2 MATERIALS

- A. Trunk Protection constructed of:
 - 1. 20-foot long 2x6 wood boards or length needed to protect the trunk if tree trunk is shorter than 20 feet in height.
 - 2. Metal wire. Gauge strong enough to tie the boards around the trunk of the tree.
- B. Tree Protection Zone Fencing:
 - 1. 6-foot-tall metal chain link construction fencing.
- C. Bark Mulch: Untreated, shredded cedar.

PART 3 - EXECUTION

3.1 GENERAL REQUIREMENTS FOR TREES BE RETAINED

- A. Maintain pre-existing moisture levels.
- B. Maintain areas inside the fenced tree protection area including lawn mowing, leaf removal, operation and repair of irrigation.
- C. Protect root systems from flooding, erosion, excessive watering and drying resulting from dewatering or other operations:
- D. Operations not Allowed:
 - 1. Run off or spillage of damaging materials in vicinity of root systems.
 - 2. Rinsing of tools or equipment under trees.
 - 3. Storage of materials, stockpile soil, park or drive vehicles within drip lines.
 - 4. Cutting, breaking skin or bark, or bruising roots or branches.
 - 5. Fires under and adjacent trees.
 - 6. Discharge exhaust under foliage.
 - 7. Securing cable, chain, or rope to trees.
 - 8. Change of grade within drip line of trees without Landscape Architect's approval.
 - 9. The use of lime.

3.2 TREE TRUNK PROTECTION

- A. Conform to requirements for trees to be retained, in accordance with article GENERAL REQUIREMENTS FOR TREES TO BE RETAINED.
- B. Install boards vertically around tree and bind together with wire to protect the bark 360 degrees around the entire tree prior to start of any demolition and construction. Boards are not to dig into bark.
- C. Major scaffold limbs may require plastic fencing to be wrapped around them for protection.

3.3 TREE DRIPLINE PROTECTION

- A. The Tree Protection Zone (TPZ) is a restricted area around the base of the tree with a radius of one foot (1') for every inch of tree trunk diameter or ten feet, which ever is greater, enclosed by 6' tall chain link fence unless otherwise directed.
- B. Signage designating the protection zone and penalties for violations shall be secured in prominent location on each protection fence.

3.4 TREE PROTECTION

- A. Duration: Tree protection shall be erected before demolition, grading, or any construction begins and remain in place until final inspection of the project.
- B. Conform to requirements for trees and plants to be retained, in accordance with article GENERAL REQUIREMENTS FOR TREES TO BE RETAINED.
- C. Construction shall not commence until approval of the Fenced Tree Protection Area Plan and Schedule of Activities Inside Tree Protection Area have been obtained from the Architect.
- D. Vehicle movement within the TPZ will only be allowed for construction equipment.
 - 1. Within dripline, apply 10-inch layer of mulch over geotextile fabric.
- E. Perform trenching operations within the TPZ of the tree so that:
 - 1. Digging shall be by hand using narrow trenching shovel.
 - 2. No roots larger than 2" diameter are cut and utilities are routed around or below them.
 - 3. Roots smaller than 2" diameter are cut with sharp tools, saws, loppers; not torn, chopped or broken.
- F. Where roots are exposed:
 - 1. Do not allow the roots to dry out.
 - 2. On the same day the excavation is made, provide temporary backfill to original grade at tree roots,

TEMPORARY TREE PROTECTION
SECTION 01 5639
3595001

3. Or cover roots with 4 layers of wet untreated burlap, made wet each day, including weekends.
- G. Roots larger than 3" in diameter are not to be cut without review and approval by an Arborist provided by Owner.

3.5 REPAIR AND REPLACEMENT OF TREES

- A. Repair or replace damaged trees as required or directed.
- B. Repair trees damaged by operations:
 1. within 24 hours of damage,
 2. to satisfaction of Landscape Architect,
 3. to ANSI A300 Pruning Standards.
- C. Replace repaired trees where repair has not restored them to health or aesthetics:
 1. within 6 months of request to replace,
 2. to the satisfaction of Landscape Architect,
 3. with replacement trees of a size and variety matching those that were removed,
- D. Replaced trees shall be maintained in good health and aesthetics for the duration of the project from installation.
 1. Submit comprehensive maintenance plan for replacement trees, including but not limited to provisions for irrigation system independent of existing system.
- E. Where suitable replacement of trees is not available:
 1. Submit affidavit to Landscape Architect that they are not available.
 2. Provide compensation to Owner at the following rates:
 - a. \$2000 for each caliper inch of tree removed under 12 inches.
 - b. \$4000 for each caliper inch of tree removed 12 inches or greater.
 - c. Caliper of trees measured at 6 inches above grade.
 - d. Caliper defined here as thickness of diameter, measured in inches.

3.6 SOIL CONTAMINATION

- A. Remove soil that has been contaminated during the performance of the Work by oil, solvents, and other materials which could be harmful to trees and plants.

TEMPORARY TREE PROTECTION
SECTION 01 5639
3595001

1. Replace with good soil in conformance with Section 31 0000, Earthwork, at Contractor's expense.

END OF SECTION

*p:\sacramento\3595 tracy unified school district\001-000_villalovoz es new shade structures\08 specifications\06 spec\04 final\freiler
- shade struct\01 5639_temporary tree protection.docx
New File: January 6, 2022*

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Requirements for preparing Storm Water Pollution Prevention Plan.

1.2 SCOPE OF WORK

A. General: Provide all materials, equipment and labor necessary to furnish and install straw wattles or silt fence barriers at locations shown on the Drawings and as required during construction.

B. The Contractor shall as a minimum address:

1. Cut and fill operations.
2. Temporary stockpiles.
3. Vehicle and equipment storage, maintenance and fueling operations.
4. Concrete, plaster, mortar and paint disposal.
5. Dust control.
6. Tracking of dirt, mud on off-site streets.
7. Pipe flushing.

1.3 ADMINISTRATIVE REQUIREMENTS

A. Submittal Procedures:

B. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures

1.4 QUALITY ASSURANCE

A. General: Comply with governing codes and regulations.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Straw Wattles: New manufactured straw rolls in compliance with state requirements for sediment control.

B. Silt Fences: New manufactured silt fence in compliance with state requirements for sediment control.

C. Filter Bag: As required by local jurisdiction.

**EROSION CONTROL
SECTION 01 5713.10
3595001**

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Straw Wattles: Install per the drawings and/or as required.
- B. Silt Fences: Install per the Drawings and/or as required. Silt Fences shall not be used around inlets.
- C. Filter Bags: Installed as required by manufacturer's requirements.

3.2 MAINTENANCE AND REMOVAL:

- A. General: Maintain and repair existing and new erosion control facilities throughout the construction period. Remove silt build up at straw wattles and/or silt fences as needed. Repair damage to earth slopes and banks. Erosion control measures shall be left in place until final paving and landscaping are complete.
- B. Monitoring: Provide monitoring of erosion control measures before and after storm events.
- C. Cleaning: Keep area clean of debris.
- D. Remove erosion control measures prior to placing finish landscaping.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: VOC restrictions for product categories listed below under Article "DEFINITIONS" and in compliance with the following.
 - 1. California Code of Regulations, Title 24, Part 11 California Green Building Standards Code.
 - 2. Local Agency Division of the State Architect.
 - 3. No Rating System is applicable.
- B. Products of each category that are installed in the project must comply; applicable laws and ordinances do not allow for partial compliance.
- C. Listing of a product in these Specifications shall not be construed as a solicitation or requirement to use any product or combination of products in violation of the requirements of South Coast Air Quality Management District Rule No.1168, as described in Rule 1168(g).
 - 1. If a listed product does not meet the requirements of this rule, request approval for use of an alternate product by the same or another manufacturer meeting the requirements of this rule.
 - 2. Do not use products which do not meet the requirements of this rule.

1.2 RELATED REQUIREMENTS

- A. Divisions 01 through 33 contain related requirements specific to the work of each of these Sections. Requirements may or may not include reference to this Section.
- B. Section 01 8113, Sustainable Design Requirements, for CAL-Green general requirements and procedures.

1.3 REFERENCES

- A. California Green Building Standards Code (CALGreen), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. Low-Emitting Materials Product List; California Collaborative for High Performance Schools (CHPS); current edition at www.chps.net/.
- C. CRI (GLCC) - Green Label Testing Program - Approved Product Categories for Carpet Cushion; Carpet and Rug Institute; current edition.
- D. CRI (GLP) - Green Label Plus Carpet Testing Program - Approved Products; Carpet and Rug Institute; current edition.
- E. GEI (SCH) - GREENGUARD "Children and Schools" Certified Products; GREENGUARD Environmental Institute; current listings at www.greenguard.org.

VOLATILE ORGANIC COMPOUND (VOC) RESTRICTIONS

SECTION 01 6116.10

3595001

- F. GreenSeal GS-36 - Commercial Adhesives; Green Seal, Inc.
- G. SCAQMD 1168 - South Coast Air Quality Management District Rule No.1168; current edition; www.aqmd.gov.
- H. SCS (CPD) - SCS Certified Products; Scientific Certification Systems; current listings at www.scs-certified.com.

1.4 DEFINITIONS

- A. VOC-Restricted Products: Products of each of the following categories when installed or applied on-site:
 - 1. Adhesives, sealants, and sealer coatings, regardless of specification Section or Division.
 - 2. Paints and coatings.
 - 3. Carpet and resilient flooring.
 - 4. Composite wood products; plywood, particleboard, wood fiberboard.
- B. Adhesives: Gunnable, trowelable, liquid-applied, and aerosol adhesives, whether specified or not; including flooring adhesives, resilient base adhesives, and pipe jointing adhesives.
- C. Sealants: Gunnable, trowelable, and liquid-applied joint sealants and sealant primers, whether specified or not; including firestopping sealants and duct joint sealers.

1.5 SUBMITTAL REQUIREMENTS

- A. Product Data: For each VOC-restricted product used in the project, submit product data showing compliance, except when another type of evidence of compliance is required.
- B. Verification of Compliance: Submit for each different product in each applicable category.
 - 1. Identify evidence submittals with the words "CALGreen VOC Compliance Report".
- C. Installer Certifications for Accessory Materials:
 - 1. Require each installer of any type of product, not just the products for which VOC restrictions are specified, to certify that either 1) no adhesives, joint sealants, paints, coatings, or composite wood or agrifiber products have been used in the installation of their products, or 2) that such products used comply with these requirements.
 - 2. Use the form following at the end of Part 3 in this Section for Installer certifications.

1.6 QUALITY ASSURANCE

- A. Manufacturer's Testing Agency Qualifications: Independent firm specializing in performing testing and inspections of the type specified in this Section.

PART 2 - PRODUCTS

2.1 MATERIALS

A. General:

1. Provide products conforming to local, State and Federal government requirements limiting the amount of volatile organic compounds contained in the product, for its intended application. If specified product exceeds current requirement, provide conforming product at no additional cost.
2. Provide only products having volatile organic compound (VOC) content not greater than required by South Coast Air Quality Management District Rule No.1168 and less where required by code.
3. Products are specified in multiple Sections throughout these Specifications.

B. Adhesives, Including Carpet and Cushion Adhesives: Comply with CALGreen Section 5.504 and Table 5.504.4.1.

1. Verification of Compliance: Acceptable types are:
 - a. Report of laboratory testing performed in accordance with requirements.
 - b. Published product data showing compliance with requirements.
 - c. Certification by manufacturer that product complies with requirements.
2. Aerosol Adhesives: Comply with Table 5.504.4.1 of CalGreen Section 5.504, and California Code of Regulations Title 17, Section 94507.
 - a. Verification of Compliance: Acceptable types are:
 - 1) Current GreenSeal Certification.
 - 2) Report of laboratory testing performed in accordance with GreenSeal GS-36 requirements.
 - 3) Published product data showing compliance with requirements.
3. Products used shall comply with the following limits.

Table 5.504.4.1 ADHESIVE VOC LIMIT	
Architectural Applications	Current VOC Limit
Indoor Carpet Adhesives	50
Carpet Pad Adhesives	50
Outdoor Carpet Adhesives	150
Wood Flooring Adhesive	100
Rubber Floor Adhesives	60
Subfloor Adhesives	50
Ceramic Tile Adhesives	65
VCT and Asphalt Tile Adhesives	50
Dry Wall and Panel Adhesives	50
Cove Base Adhesives	50
Multipurpose Construction Adhesives	70
Structural Glazing Adhesives	100

VOLATILE ORGANIC COMPOUND (VOC) RESTRICTIONS**SECTION 01 6116.10****3595001**

Table 5.504.4.1 ADHESIVE VOC LIMIT	
Single Ply Roof Membrane Adhesives	250
Other adhesives not specifically listed	250
VOC Limits and Effective Dates**	
Specialty Applications	Current VOC Limit
PVC Welding	510
CPVC Welding	490
ABS Welding	325
Plastic Cement Welding	250
Adhesive Primer for Plastic	550
Contact Adhesive	80
Special Purpose Contact Adhesive	250
Structural Wood Member Adhesive	140
Top and Trim Adhesive	250
** The specified limits remain in effect unless revised limits are listed in the current governing edition of CalGreen.	
For adhesives, adhesive bonding primers, or any other primer not regulated by the above two Tables and applied to the following substrates, the following limits shall apply:	
Substrate Specific Applications	Current VOC Limit
Metal to Metal	30
Plastic Foams	50
Porous Material (except wood)	50
Wood	30
Fiberglass 80	80
Note: If an adhesive is used to bond dissimilar substrates together the adhesive with the highest VOC content shall be allowed.	

C. Joint Sealants: Comply with CALGreen Section 5.504 and Table 5.504.4.2.

1. Verification of Compliance: Acceptable types are:
 - a. Report of laboratory testing performed in accordance with requirements.
 - b. Published product data showing compliance with requirements.
 - c. Certification by manufacturer that product complies with requirements.
2. Products used shall comply with the following limits.

Table 5.504.4.2 SEALANT VOC LIMIT	
Less Water and Less Exempt Compounds in Grams per Liter	
Sealant	Current VOC Limit
Architectural	250
Marine Deck	760
Non-Membrane Roof	300
Roadway	250
Single-Ply Roof Membrane	450

VOLATILE ORGANIC COMPOUND (VOC) RESTRICTIONS**SECTION 01 6116.10****3595001**

Table 5.504.4.2 SEALANT VOC LIMIT	
Less Water and Less Exempt Compounds in Grams per Liter	
Other	420
Sealant Primers	Current VOC Limit
Architectural	
Non-Porous	250
Porous	775
Modified Bituminous	500
Marine Deck	760
Other	750
For low-solid adhesives or sealants the VOC limit is expressed in grams per liter of material; for all other adhesives and sealants, VOC limits are expressed as grams of VOC per liter of adhesive or sealant less water and less exempt compounds.	

- D. Paints and Coatings: Comply with CALGreen Section 5.504 and Table 5.504.4.3 based on the California Air Resources Board, Architectural Coatings Suggested Control Measure.
1. Determination of VOC Content: Testing and calculation in accordance with 40 CFR 59, Subpart D (EPA Method 24), exclusive of colorants added to a tint base and water added at Project site; or other method acceptable to authorities having jurisdiction.
 - a. Verification of Compliance: Acceptable types are:
 - 1) Report of laboratory testing performed in accordance with requirements.
 - 2) Published product data showing compliance with requirements.
 - 3) Certification by manufacturer that product complies with requirements.
 2. Provide coatings that comply with the most stringent requirements specified in the following:
 - a. 40 CFR 59, Subpart D--National Volatile Organic Compound Emission Standards for Architectural Coatings.
 - b. South Coast Air Quality Management District Rule No.1168.
 3. Aerosol Paints and Coatings: Comply with CALGreen 5.504.4.3.1 and, for projects in the jurisdiction of BAAQMD, comply with VOC by weight of product limits of regulation 8, Rule 49.
 4. Products used shall comply with the following limits.

Table 5.504.4.3 VOC CONTENT LIMITS FOR ARCHITECTURAL COATINGS	
(See Notes 2 & 3 below)	
Grams of VOC per Liter of Coating, less water and less exempt compounds	
Coating Category	Current VOC Limit 1/1/2012
Flat Coatings	50

VOLATILE ORGANIC COMPOUND (VOC) RESTRICTIONS
SECTION 01 6116.10
3595001

Table 5.504.4.3 VOC CONTENT LIMITS FOR ARCHITECTURAL COATINGS (See Notes 2 & 3 below)	
Grams of VOC per Liter of Coating, less water and less exempt compounds	
Coating Category	Current VOC Limit 1/1/2012
Non-Flat Coatings	100
Non-Flat High Gloss Coatings	150
Specialty Coatings	
Aluminum Roof Coatings	400
Basement Specialty Coatings	400
Bituminous Roof Coatings	50
Bituminous Roof Primers	350
Bond Breakers	350
Concrete Curing Compounds	350
Concrete / Masonry Sealers	100
Driveway Sealers	50
Dry Fog Coatings	150
Faux Finishing Coatings	350
Fire Resistive Coatings	350
Floor Coatings	100
Form-Release Compounds	250
Graphic Arts Coatings (Sign Paints)	500
High-Temperature Coatings	420
Industrial Maintenance Coatings	250
Low Solids Coatings (See Note 1 below)	120
Magnesite Cement Coatings	450
Mastic Texture Coatings	100
Metallic Pigmented Coatings	500
Multicolor Coatings	250
Pretreatment Wash Primers	420
Primers, Sealers and Undercoaters	100
Reactive Penetrating Sealers	350
Recycled Coatings	250
Roof Coatings	50
Rust Preventative Coatings	250
Shellacs:	
Clear	730
Opaque	550
Specialty Primers, Sealers and Undercoaters	100
Stains	250
Stone Consolidants	450
Swimming Pool Coatings	340
Traffic Marking Coatings	100
Waterproofing Membranes	250
Wood Coatings	275
Wood Preservatives	350

VOLATILE ORGANIC COMPOUND (VOC) RESTRICTIONS
SECTION 01 6116.10
3595001

Table 5.504.4.3 VOC CONTENT LIMITS FOR ARCHITECTURAL COATINGS (See Notes 2 & 3 below)	
Grams of VOC per Liter of Coating, less water and less exempt compounds	
Coating Category	Current VOC Limit 1/1/2012
Zinc Rich Primers	340
Note 1: Grams of VOC per liter of coating including water and including exempt compounds	
Note 2: Not Applicable	
Note 3: Values in this table are derived from those specified by the California Air Resources Board, Architectural Coatings Suggested Control Measure, February 1, 2008. More information is available from the Air Resources Board.	

5. Restricted Components: In addition to the specified VOC limits, paints and coatings shall not contain any of the following:
- a. Acrolein.
 - b. Acrylonitrile.
 - c. Antimony.
 - d. Benzene.
 - e. Butyl benzyl phthalate.
 - f. Cadmium.
 - g. Di (2-ethylhexyl) phthalate.
 - h. Di-n-butyl phthalate.
 - i. Di-n-octyl phthalate.
 - j. 1,2-dichlorobenzene.
 - k. Diethyl phthalate.
 - l. Dimethyl phthalate.
 - m. Ethylbenzene.
 - n. Formaldehyde.
 - o. Hexavalent chromium.
 - p. Isophorone.
 - q. Lead.
 - r. Mercury.
 - s. Methyl ethyl ketone.
 - t. Methyl isobutyl ketone.
 - u. Methylene chloride.
 - v. Naphthalene.
 - w. Toluene (methylbenzene).
 - x. 1,1,1-trichloroethane.
 - y. Vinyl chloride.

VOLATILE ORGANIC COMPOUND (VOC) RESTRICTIONS
SECTION 01 6116.10
3595001

PART 3 - EXECUTION

3.1 FIELD QUALITY CONTROL

- A. Owner reserves the right to reject non-compliant products, whether installed or not, and require their removal and replacement with compliant products at no extra cost to Owner.
- B. Additional costs to restore indoor air quality, including fines by authorities, due to installation of non-compliant products shall be borne by Contractor.

3.2 CERTIFICATION FORM

- A. Use of this Form:
 - 1. Because installers are allowed and directed to choose accessory materials suitable for the applicable installation, there is a possibility that such accessory materials might contain VOC content in excess of that permitted, especially where such materials have not been explicitly specified.
 - 2. Contractor is required to obtain and submit this Form from each installer of work on this project.
 - 3. For each product category listed, circle the correct words in brackets: either [HAS] or [HAS NOT].
 - 4. If these accessory materials have been used, attach to this form product data and MSDS sheet for each such product.

(The Remainder of this Page is Intentionally Left Blank)

ACCESSORY MATERIAL VOC CONTENT CERTIFICATION FORM

IDENTIFICATION:

Project Name: _____

Project No.: _____

Architect: _____

PRODUCT CERTIFICATION: I certify that the installation work of my firm on this project:

1. [HAS] [HAS NOT] required the use of any ADHESIVES.
2. [HAS] [HAS NOT] required the use of any JOINT SEALANTS.
3. [HAS] [HAS NOT] required the use of any PAINTS OR COATINGS.
4. [HAS] [HAS NOT] required the use of any COMPOSITE WOOD or AGRIFIBER PRODUCTS.

Product data and MSDS sheets are attached.

CERTIFIED BY (Installer/Manufacturer/Supplier Firm):

Firm Name: _____

Print Name: _____

Signature: _____

Title: _____ (officer of company)

Date: _____

VOLATILE ORGANIC COMPOUND (VOC) RESTRICTIONS
SECTION 01 6116.10
3595001

END OF SECTION

*p:\sacramento\3595 tracy unified school district\001-000_villalovoz es new shade structures\08 specifications\06 spec\04 final\freiler
- shade struct\01 6116.10_volatile organic compound (voc) restrictions.docx
Last Updated: January 18, 2022*

SECTION 01 66 00

PRODUCT DELIVERY, STORAGE AND HANDLING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Site Access, Conditions and Requirements;
- B. Special Conditions.

1.02 PRODUCTS

- A. Products are as defined in the General Conditions.
- B. Contractor shall not use and/or reuse materials and/or equipment removed from existing Premises, except as specifically permitted by the Contract Documents.
- C. Contractor shall provide interchangeable components of the same manufacturer, for similar components.

1.03 TRANSPORTATION AND HANDLING

- A. Contractor shall transport and handle Products in accordance with manufacturer's instructions.
- B. Contractor shall promptly inspect shipments to confirm that Products comply with requirements, quantities are correct, and products are undamaged.
- C. Contractor shall provide equipment and personnel to handle Products by methods to prevent soiling, disfigurement, or damage.

1.04 STORAGE AND PROTECTION

- A. Contractor shall store and protect Products in accordance with manufacturer's instructions, with seals and labels intact and legible. Contractor shall store sensitive products in weather-tight, climate controlled enclosures.
- B. For exterior storage of fabricated Products, Contractor shall place on sloped supports, above ground.
- C. Contractor shall provide off-site storage and protection when Site does not permit on-site storage or protection.

- D. Contractor shall cover products subject to deterioration with impervious sheet covering and provide ventilation to avoid condensation.
- E. Contractor shall store loose granular materials on solid flat surfaces in a well-drained area and prevent mixing with foreign matter.
- F. Contractor shall provide equipment and personnel to store Products by methods to prevent soiling, disfigurement, or damage.
- G. Contractor shall arrange storage of Products to permit access for inspection and periodically inspect to assure Products are undamaged and are maintained under specified conditions.

PART 2 – PRODUCTS Not Used.

PART 3 - EXECUTION Not Used.

END OF DOCUMENT

FIELD ENGINEERING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Site Investigation, and Soils Investigation Report;
- B. Special Conditions;
- C. Site-Visit Certification.

1.02 REQUIREMENTS INCLUDED:

- A. Contractor shall provide and pay for field engineering services by a California-registered engineer, required for the project, including, without limitations:
 - (1) Survey work required in execution of the Project.
 - (2) Civil or other professional engineering services specified, or required to execute Contractor's construction methods.

1.03 QUALIFICATIONS OF SURVEYOR OR ENGINEERS:

Contractor shall only use a qualified licensed engineer or registered land surveyor, to whom District makes no objection.

1.04 SURVEY REFERENCE POINTS:

- A. Existing basic horizontal and vertical control points for the Project are those designated on the Drawings.
- B. Contractor shall locate and protect control points prior to starting Site Work and preserve all permanent reference points during construction. In addition Contractor shall:
 - (1) Make no changes or relocation without prior written notice to District and Architect.
 - (2) Report to District and Architect when any reference point is lost or destroyed, or requires relocation because of necessary changes in grades or locations.
 - (3) Require surveyor to replace Project control points based on original survey control that may be lost or destroyed.

1.05 RECORDS:

Contractor shall maintain a complete, accurate log of all control and survey work as it progresses.

1.06 SUBMITTALS:

- A. Contractor shall submit name and address of Surveyor and Professional Engineer to District and Architect prior to its/their work on the Project.
- B. On request of District and Architect, Contractor shall submit documentation to verify accuracy of field engineering work, at no additional cost to the District.
- C. Contractor shall submit a certificate signed by registered engineer or surveyor certifying that elevations and locations of improvements are in conformance or nonconformance with Contract Documents.

PART 2 – PRODUCTS Not Used.**PART 3 - EXECUTION****3.01 COMPLIANCE WITH LAWS:**

Contractor is responsible for meeting all applicable codes, OSHA, safety and shoring requirements.

3.02 NONCONFORMING WORK:

Contractor is responsible for any re-surveying required by correction of nonconforming work.

END OF DOCUMENT

CUTTING AND PATCHING

PART 1 – GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Inspector, Inspections, and Tests, Integration of Work, Nonconforming Work, and Correction of Work, and Uncovering Work;
- B. Special Conditions;
- C. Imported Materials Certification.

1.02 CUTTING AND PATCHING:

- A. Contractor shall be responsible for all cutting, fitting, and patching, including associated excavation and backfill, required to complete the Work or to:
 - (1) Make several parts fit together properly.
 - (2) Uncover portions of Work to provide for installation of ill-timed Work.
 - (3) Remove and replace defective Work.
 - (4) Remove and replace Work not conforming to requirements of Contract Documents.
 - (5) Remove Samples of installed Work as specified for testing.
 - (6) Provide routine penetrations of non-structural surfaces for installation of piping and electrical conduit.
 - (7) Attaching new materials to existing remodeling areas – including painting (or other finishes) to match existing conditions.
- B. In addition to Contract requirements, upon written instructions from the District, Contractor shall uncover Work to provide for observations of covered Work in accordance with the Contract Documents; remove samples of installed materials for testing as directed by District; and remove Work to provide for alteration of existing Work.
- C. Contractor shall not cut or alter Work, or any part of it, in such a way that endangers or compromises the integrity of the Work, the Project, or work of others.

1.03 SUBMITTALS:

- A. Prior to any cutting or alterations that may affect the structural safety of Project, or work of others, and well in advance of executing such cutting or alterations, Contractor shall submit written notice to District pursuant to the applicable notice provisions of the Contract Documents, requesting consent to proceed with the cutting or alteration, including the following:
 - (1) The work of the District or other trades.
 - (2) Structural value or integrity of any element of Project.
 - (3) Integrity or effectiveness of weather-exposed or weather-resistant elements or systems.
 - (4) Efficiency, operational life, maintenance or safety of operational elements.
 - (5) Visual qualities of sight-exposed elements.
- B. Contractor's Request shall also include:
 - (1) Identification of Project.
 - (2) Description of affected Work.
 - (3) Necessity for cutting, alteration, or excavations.
 - (4) Effects of Work on District, other trades, or structural or weatherproof integrity of Project.
 - (5) Description of proposed Work:
 - (a) Scope of cutting, patching, alteration, or excavation.
 - (b) Trades that will execute Work.
 - (c) Products proposed to be used.
 - (d) Extent of refinishing to be done.
 - (6) Alternates to cutting and patching.
 - (7) Cost proposal, when applicable.
 - (8) The scheduled date the Contractor intends to perform the Work and the duration of time to complete the Work.
 - (9) Written permission of District or other District contractor(s) whose work will be affected.

1.04 QUALITY ASSURANCE:

- A. Contractor shall ensure that cutting, fitting, and patching shall achieve security, strength, weather protection, appearance for aesthetic match, efficiency, operational life, maintenance, safety of operational elements, and the continuity of existing fire ratings.
- B. Contractor shall ensure that cutting, fitting, and patching shall successfully duplicate undisturbed adjacent profiles, materials, textures, finishes, colors, and that materials shall match existing construction. Where there is dispute as to whether duplication is successful or has been achieved to a reasonable degree, the District's decision shall be final.

1.05 PAYMENT FOR COSTS:

- A. Cost caused by ill-timed or defective Work or Work not conforming to Contract Documents, including costs for additional services of the District, its consultants, including but not limited to the Construction Manager, the Architect, the Project Inspector(s), Engineers, and Agents, will be paid by Contractor and/or deducted from the Contract by the District.
- B. District shall only pay for cost of Work if it is part of the original Contract Price or if a change has been made to the contract in compliance with the provisions of the General Conditions. Cost of Work performed upon instructions from the District, other than defective or nonconforming Work, will be paid by District on approval of written Change Order. Contractor shall provide written cost proposals prior to proceeding with cutting and patching.

PART 2 - PRODUCTS

2.01 MATERIALS:

- A. Contractor shall provide for replacement and restoration of Work removed. Contractor shall comply with the Contract Documents and with the Industry Standard(s), for the type of Work, and the Specification requirements for each specific product involved. If not specified, Contractor shall first recommend a product of a manufacturer or appropriate trade association for approval by the District.
- B. Materials to be cut and patched include those damaged by the performance of the Work.

PART 3 – EXECUTION

3.01 INSPECTION:

- A. Contractor shall inspect existing conditions of the Site and the Work, including elements subject to movement or damage during cutting and patching, excavating and backfilling. After uncovering Work, Contractor shall inspect conditions affecting installation of new products.

- B. Contractor shall report unsatisfactory or questionable conditions in writing to District as indicated in the General Conditions and shall proceed with Work as indicated in the General Conditions by District.

3.02 PREPARATION:

- A. Contractor shall provide shoring, bracing and supports as required to maintain structural integrity for all portions of the Project, including all requirements of the Project.
- B. Contractor shall provide devices and methods to protect other portions of Project from damage.
- C. Contractor shall, provide all necessary protection from weather and extremes of temperature and humidity for the Project, including without limitation, any work that may be exposed by cutting and patching Work. Contractor shall keep excavations free from water.

3.03 ERECTION, INSTALLATION AND APPLICATION:

- A. With respect to performance, Contractor shall:
 - (1) Execute fitting and adjustment of products to provide finished installation to comply with and match specified tolerances and finishes.
 - (2) Execute cutting and demolition by methods that will prevent damage to other Work, and provide proper surfaces to receive installation of repairs and new Work.
 - (3) Execute cutting, demolition excavating, and backfilling by methods that will prevent damage to other Work and damage from settlement.
- B. Contractor shall employ original installer or fabricator to perform cutting and patching for:
 - (1) Sight-exposed finished surfaces.
- C. Contractor shall execute fitting and adjustment of products to provide a finished installation to comply with specified products, functions, tolerances, and finishes as shown or specified in the Contract Documents including, without limitation, the Drawings and Specifications.
- D. Contractor shall fit Work airtight to pipes, sleeves, conduit, and other penetrations through surfaces. Contractor shall conform to all Code requirements for penetrations or the Drawings and Specifications, whichever calls for a higher quality or more thorough requirement. Contractor shall maintain integrity of both rated and non-rated fire walls, ceilings, floors, etc.
- E. Contractor shall restore Work which has been cut or removed. Contractor shall install new products to provide completed Work in accordance with requirements of the Contract Documents and as required to match surrounding areas and surfaces.

- F. Contractor shall refinish all continuous surfaces to nearest intersection as necessary to match the existing finish to any new finish.

END OF DOCUMENT

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes: Requirements and procedures for ensuring optimal diversion of construction waste materials generated by the Work from landfill disposal within the limits of the Construction Schedule and Contract Sum.
 - 1. The Work of this Contract requires that a minimum of **[65%]** by weight of the construction and demolition materials generated in the Work is diverted from landfill disposal through a combination of re-use and recycling activities.
 - 2. CAL-Green: Alternate waste reduction methods developed in cooperation with local agencies if diversion or recycle facilities capable of compliance with CAL-Green requirements do not exist within the haul boundary of the jobsite (California Code of Regulations, Title 24, Part 11, 5.408).
 - 3. **[LEED projects: Requirements for submittal of LEED documentation in compliance with Materials and Resources Credit 2.1 and Materials and Resources Credit 2.2, Construction Waste Management.]**
 - 4. Requirements for submittal of Contractor's Construction Waste and Recycling Plan prior to the commencement of the Work.
 - 5. Contractor's quantitative reports for construction waste materials as a condition of approval of progress payments submitted to the **[EDIT: Architect or Construction Manager]**

1.2 RELATED REQUIREMENTS

- A. Section 01 3516, Alteration Project Procedures.
- B. Section 01 5000, Temporary Facilities & Controls.
- C. Section 01 7329, Cutting and Patching.
- D. Section 01 8113, Sustainable Design Requirements, for CAL-Green general requirements and procedures.
- E. Section 02 2600, Hazardous Material Abatement (Various Materials).
- F. Section 02 2623, Asbestos Assessment.
- G. Section 02 2626, Lead Assessment.
- H. Section 02 2629, Hazardous Materials Assessment - PCB Ballast & Fluorescent Lamps.
- I. Section 02 4116, Building Demolition.
- J. Section 02 4119, Selective Demolition.
- K. Section 31 1000, Site Clearing.

CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL
SECTION 01 7419
3595001

1.3 REFERENCES AND STANDARDS

- A. California Green Building Standards Code (CALGreen), edition as noted on the drawings, as adopted by the California Division of the State Architect (DSA).

1.4 DEFINITIONS

- A. Class III Landfill: A landfill that accepts non-hazardous resources such as household, commercial, and industrial waste, resulting from construction, remodeling, repair, and demolition operations. A Class III landfill must have a solid waste facilities permit from the California Integrated Waste Management Board (CIWMB) and is regulated by the Enforcement Agency (EA).
- B. Construction and Demolition Debris: Building materials and solid waste resulting from construction, remodeling, repair, cleanup, or demolition operations that are not hazardous as defined in California Code of Regulations, Title 22, Section 66261.3 et seq. This term includes, but is not limited to, asphalt concrete, Portland cement concrete, brick, lumber, gypsum wallboard, cardboard and other associated packaging, roofing material, ceramic tile, carpeting, plastic pipe, and steel. The debris may be commingled with rock, soil, tree stumps, and other vegetative matter resulting from land clearing and landscaping for construction or land development projects.
- C. C&D Recycling Center: A facility that receives only construction and demolition debris material that has been separated for reuse prior to receipt, in which the residual (disposed) amount of waste in the material is less than 10% of the amount separated for reuse by weight.
- D. Disposal: Final deposition of construction and demolition or inert debris into land, including stockpiling onto land of construction and demolition debris that has not been sorted for further processing or resale, if such stockpiling is for a period of time greater than 30 days; and construction and demolition debris that has been sorted for further processing or resale, if such stockpiling is for a period of time greater than one year, or stockpiling onto land of inert debris that is for a period of time greater than one year.
- E. Enforcement Agency (EA): Enforcement agency is the authority having jurisdiction within the Project location.
- F. Inert Disposal Facility or Inert Waste Landfill: A disposal facility that accepts only inert waste such as soil and rock, fully cured asphalt paving, uncontaminated concrete (including fiberglass or steel reinforcing rods embedded in the concrete), brick, glass, and ceramics, for land disposal.
- G. Mixed Debris: Loads that include commingled recyclable and non-recyclable materials generated at the construction site.
- H. Mixed Debris Recycling Facility: A processing facility that accepts loads of commingled construction and demolition debris for the purpose of recovering re-usable and recyclable materials and disposing the non-recyclable residual materials.

CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL
SECTION 01 7419
3595001

- I. Recycling: The process of sorting, cleansing, treating and reconstituting materials for the purpose of using the altered form in the manufacture of a new product. Recycling does not include burning, incinerating or thermally destroying solid waste.
- J. Reuse. The use, in the same or similar form as it was produced, of a material which might otherwise be discarded.
- K. Separated for Reuse. Materials, including commingled recyclables, that have been separated or kept separate from the solid waste stream for the purpose of additional sorting or processing those materials for reuse or recycling in order to return them to the economic mainstream in the form of raw material for new, reused, or reconstituted products which meet the quality standards necessary to be used in the marketplace, and includes materials that have been "source separated".
- L. Solid Waste: All putrescible and nonputrescible solid, semisolid, and liquid wastes, including garbage, trash, refuse, paper, rubbish, ashes, industrial wastes, demolition and construction wastes, abandoned vehicles and parts thereof, discarded home and industrial appliances, dewatered, treated, or chemically fixed sewage sludge which is not hazardous waste, manure, vegetable or animal solid and semisolid wastes, and other discarded solid and semisolid wastes. "Solid waste" does not include hazardous waste, radioactive waste, or medical waste as defined or regulated by State law.
- M. Source-Separated: Materials, including commingled recyclables, that have been separated or kept separate from the solid waste stream at the point of generation, for the purpose of additional sorting or processing of those materials for reuse or recycling in order to return them to the economic mainstream in the form of raw materials for new, reused, or reconstituted products which meet the quality standards necessary to be used in the marketplace.
- N. Waste Hauler: A company that possesses a valid permit from the local waste management authority having jurisdiction to collect and transport solid wastes from individuals or businesses for the purpose of recycling or disposal.

1.5 ADMINISTRATIVE REQUIREMENTS

- A. Submittal Procedures:
 - 1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
 - 2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
 - 3. Sustainable Design Submittals shall comply with the additional requirements of Section 01 8113, Sustainable Design Requirements.

1.6 ACTION SUBMITTALS

- A. Contractor's Construction Waste and Recycling Plan:
 - 1. Review Contract Documents and estimate the types and quantities of materials under the Work that are anticipated to be feasible for on-site processing, source separation for re-use or recycling. Indicate the procedures that will be implemented

CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL
SECTION 01 7419
3595001

- in this program to effect jobsite source separation, such as, identifying a convenient location where dumpsters would be located, putting signage to identify materials to be placed in dumpsters, etc.
2. Prior to commencing the Work, submit Contractor's Construction Waste and Recycling Plan. Submit in format provided with this specification section. The Plan must include, but is not limited to the following:
 - a. Contractor's name and project identification information;
 - b. Procedures to be used;
 - c. Materials to be re-used and recycled;
 - d. Estimated quantities of materials;
 - e. Names and locations of re-use and recycling facilities/sites;
 - f. Tonnage calculations that demonstrate that Contractor will re-use and recycle a minimum of **[65%]** by weight of the construction waste materials generated by the Work.
 3. Contractor's Construction Waste and Recycling Plan must be approved by the Architect prior to the start of Work.
 4. Contractor's Construction Waste and Recycling Plan will not otherwise relieve the Contractor of responsibility for adequate and continuing control of pollutants and other environmental protection measures

1.7 INFORMATIONAL SUBMITTALS

- A. Contractor's Reuse, Recycling, and Disposal Report:
 1. Submit Contractor's Reuse, Recycling, and Disposal Report on the form provided with this specification section with each Application & Certificate for Payment. Failure to submit the form and its supporting documentation will render the Application & Certificate for Payment incomplete and delay progress payments. If applicable, include manifests, weight tickets, receipts, and invoices specifically identifying the Project for re-used and recycled materials:
 - a. Reuse of building materials or salvage items on site (i.e. crushed base or red clay brick).
 - b. Salvaging building materials or salvage items at an offsite salvage or reuse center (i.e. lighting, fixtures).
 - c. Recycling source separated materials on site (i.e. crushing asphalt/concrete for base course, or grinding for mulch).
 - d. Recycling source separated material at an offsite recycling center (i.e. scrap metal or green materials).
 - e. Use of material as Alternative Daily Cover (ADC) at landfills.
 - f. Delivery of soils or mixed inerts to an inert landfill for disposal (inert fill).
 - g. Disposal at a landfill or transfer station (where no recycling takes place).
 - h. Other (describe).
 2. Contractor's Reuse, Recycling, and Disposal Report must quantify all materials generated in the Work, disposed in Class III landfills, or diverted from disposal through recycling. Indicate zero (0) if there is no quantity to report for a type of material. As indicated on the form:

CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL
SECTION 01 7419
3595001

- a. Report disposal or recycling either in tons or in cubic yards. If scales are available at disposal or recycling facility, report in tons; otherwise, report in cubic yards. Report in units for salvage items when no tonnage or cubic yard measurement is feasible.
 - b. Indicate locations to which materials are delivered for reuse, salvage, recycling, accepted as daily cover, inert backfill, or disposal in landfills or transfer stations.
 - c. Provide legible copies of weight tickets, receipts, or invoices that specifically identify the project generating the material. Said documents must be from recyclers and/or disposal site operators that can legally accept the materials for the purpose of re-use, recycling, or disposal.
 - 1) Indicate project title, project number, progress payment number, name of the company completing the Contractor's Report and compiling backup documentation, the printed name, signature, and daytime phone number of the person completing the form, the beginning and ending dates of the period covered on the Contractor's Report, and the date that the Contractor's Report is completed.
3. Demonstrate compliance with California Code of Regulations, Title 24, Part 11 California Green Building Standards Code, "CAL-Green" 5.408.2, to the satisfaction of the enforcing agency.
- a. Landfill **[and Incinerator]** Disposal Records: Indicate receipt and acceptance of waste by landfills **[and incinerator]** facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.
 - b. Recycling and Processing Facility Records: Indicate receipt and acceptance of recyclable waste by recycling and processing facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.
- B. **[For LEED Projects only]** LEED Letter Template: Materials and Resources Credit **[2.1]**
[2.2] Construction Waste Management
1. Complete and sign LEED Letter Template in format provided under the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED) program. Prepare Letter Template on company letterhead.
 - a. Certify that the project has completed a waste management plan and diverted construction, demolition, and land clearing waste to uses other than landfill.
 - b. Provide quantities of diverted materials and means of diversion in the table provided in the LEED Letter Template.
 - c. Indicate how and where waste was diverted.
 - d. Indicate quantities of waste diverted in tons or cubic yards.
 - e. Letter Template will calculate: Total quantity of diverted waste, total quantity of waste, and the percentage of waste diverted.
 - f. For projects where 50% of waste is diverted, one LEED credit will be achieved; where 75% is diverted, two LEED credits will be achieved.
 - g. Include name, organization, role in project, provide signature and date complete

CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL
SECTION 01 7419
3595001

PART 2 - PRODUCTS-NOT USED

PART 3 - EXECUTION

3.1 WASTE MANAGEMENT PLAN

- A. Implement procedures for disposal of materials, as specified in Contractor's Construction Waste and Recycling Plan, which are not diverted for re-use, salvage or recycling.
 - 1. Identify materials to be diverted from disposal by efficient usage, recycling, reuse on the project, or salvage for future use or sale.
 - 2. Determine if materials will be sorted on-site or mixed.
 - 3. Identify diversion facilities where material collected will be taken.
 - 4. Specify that quantities of diverted material will be calculated by weight or volume, but not both.

3.2 SALVAGE, RE-USE, RECYCLING AND PROCEDURES

- A. Re-use, Salvage, and Recycling Facilities: As specified in Contractor's Construction Waste and Recycling Plan.
- B. Develop and implement procedures to re-use, salvage, and recycle new construction and excavation materials, based on the Contract Documents, the Contractor's Construction Waste and Recycling Plan, estimated quantities of available materials, and availability of recycling facilities. Procedures may include on-site recycling, source separated recycling, and/or mixed debris recycling efforts.
 - 1. Identify materials that are feasible for salvage, determine requirements for site storage, and transportation of materials to a salvage facility.
 - 2. Source separate new construction, excavation and demolition materials including, but not limited to the following types.
 - a. Asphalt.
 - b. Concrete, concrete block, slump stone (decorative concrete block), and rocks.
 - c. Drywall.
 - d. Green materials (i.e. tree trimmings and land clearing debris).
 - e. Metal (ferrous and non-ferrous).
 - f. Miscellaneous Construction Debris.
 - g. Paper or cardboard.
 - h. Red Clay Brick.
 - i. Reuse or Salvage Materials
 - j. Soils.
 - k. Wire and Cable.
 - l. Wood.
 - m. Other (describe)

CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL
SECTION 01 7419
3595001

3. Miscellaneous Construction Debris: Develop and implement a program to transport loads of mixed (commingled) new construction materials that cannot be feasibly source separated to a mixed materials recycling facility

3.3 DISPOSAL OPERATIONS AND WASTE HAULING

- A. Legally transport and dispose of materials that cannot be delivered to a source separated or mixed recycling facility to a transfer station or disposal facility that can legally accept the materials for the purpose of disposal.
- B. Use a permitted waste hauler or Contractor's trucking services and personnel. To confirm valid permitted status of waste haulers, contact the local solid waste authority having jurisdiction.
- C. Become familiar with the conditions for acceptance of new construction, excavation and demolition materials at recycling facilities, prior to delivering materials.
- D. Deliver to facilities that can legally accept new construction, excavation and demolition materials for purpose of re-use, recycling, composting, or disposal.
- E. Do not burn, bury or otherwise dispose of solid waste on the project job-site.

3.4 RE-USE AND DONATION OPTIONS

- A. Implement a re-use program to the greatest extent feasible. Options may include:
 1. California Materials Exchange (CAL-MAX) Program is sponsored by the California Integrated Waste Management Board. CAL-MAX is a free service provided by the California Integrated Waste Management Board, designed to help businesses find markets for materials that traditionally would be discarded. The premise of the CAL-MAX Program is that material discarded by one business may be a resource for another business. To obtain a current Materials Listings Catalog, call CAL-MAX/California Integrated Waste Management Board at (916) 255-2369 or send a FAX to (916) 255-2200. The CALMAX Catalog is available through the Internet Site at <http://www.ciwmb/ca.gov/calmax>.

3.5 REVENUE

- A. Revenues or other savings obtained from recycled, re-used, or salvaged materials shall accrue to Contractor unless otherwise noted in the Contract Documents

END OF SECTION

p:\sacramento\3595 tracy unified school district\001-000_villalovoz es new shade structures\08 specifications\06 spec\04 final\freiler - shade struct\01 7419_construction waste management and disposal.docx
Last Updated: December 16, 2021

SECTION 01 7419A
CONTRACTOR'S CONSTRUCTION WASTE AND RECYCLING PLAN
(Submit After Award of Contract and Prior to Start of Work)

Project Title:		
Contract or Work Order No.:		
Contractor's Name:		
Street Address:		
City:	State:	Zip:
Phone: ()	Fax: ()	
E-Mail Address:		
Prepared by: (Print Name)		

Date Submitted:		
Project Period:	From:	TO:

Reuse, Recycling or Disposal Processes To Be Used

Describe the types of recycling processes or disposal activities that will be used for material generated in the project. Indicate the type of process or activity by number, types of materials, and estimated quantities that will be recycled or disposed in the sections below:

- 01 - Reuse of building materials or salvage items on site (i.e. crushed base or red clay brick)
- 02 - Salvaging building materials or salvage items at an off site salvage or re-use center (i.e. lighting, fixtures)
- 03 - Recycling source separated materials on site (i.e. crushing asphalt/concrete for reuse or grinding for mulch)
- 04 - Recycling source separated materials at an off site recycling center (i.e. scrap metal or green matls)
- 05 - Recycling commingled loads of C&D matls at an off site mixed debris recycling center or transfer station
- 06 - Recycling material as Alternative Daily Cover at landfills
- 07 - Delivery of soils or mixed inerts to an inert landfill for disposal (inert fill).
- 08 - Disposal at a landfill or transfer station.
- 09 - Other (please describe) _____

Types of Material To Be Generated

Use these codes to indicate the types of material that will be generated on the project

A = Asphalt	C = Concrete	M = Metals	I = Mixed Inert	G = Green Matls
D = Drywall	P/C=Paper/Cardboard	W/C = Wire/Cable	S= Soils (Non Hazardous)	
M/C = Miscellaneous Construction Debris	R = Reuse/Salvage	W = Wood	O = Other (describe)	

Facilities Used: Provide Name of Facility and Location (City)

Total Truck Loads: Provide Number of Trucks Hauled from Site During Reporting Period

Total Quantities: If scales are available at sites, report in tons. If not, quantify by cubic yards. For salvage/reuse items, quantify by estimated weight (or units).

SECTION I - RE-USED/RECYCLED MATERIALS

Include all recycling activities for source separated or mixed material recycling centers where recycling will occur.

Type of Material	Type of Activity	Facility to be Used/Location	Total Truck Loads	Total Quantities		
(ex.) M	04	ABC Metals, Los Angeles	24	Tons	Cubic YD	Other Wt.
a. Total Diversion			0	0	0	0

SECTION 01 7419A
CONTRACTOR'S CONSTRUCTION WASTE AND RECYCLING PLAN
Continued

SECTION II - DISPOSED MATERIALS						
<i>Include all disposal activities for landfills, transfer stations, or inert landfills where no recycling will occur.</i>						
Type of Material	Type of Activity	Facility to be Used/Location	Total Truck Loads	Total Quantities		
				Tons	Cubic YD	Other Wt.
(ex.) D	08	DEF Landfill, Los Angeles	2	35		
b. Total Disposal				0	0	0

SECTION III - TOTAL MATERIALS GENERATED						
<i>This section calculates the total materials to be generated during the project period (Reuse/Recycle + Disposal = Generation)</i>						
				Tons	Cubic YD	Other Wt.
a. Total Reused/Recycled				0	0	0
b. Total Disposed				0	0	0
c. Total Generated				0	0	0

SECTION IV - CONTRACTOR'S LANDFILL DIVERSION RATE CALCULATION						
<i>Add totals from Section I + Section II</i>						
	Tons	Cubic Yards	Other Wt.			
a. Materials Re-Used and Recycled	0					
b. Materials Disposed	0					
c. Total Materials Generated (a. + b. = c.)	0	0	0			
d. Landfill Diversion Rate (Tons Only)*	#DIV/0!					

* Use tons only to calculate recycling percentages: Tons Reused/Recycled/Tons Generated = % Recycled

Contractor's Comments (Provide any additional information pertinent to planned reuse, recycling, or disposal activities):

Notes:

1. Suggested Conversion Factors: From Cubic Yards to Tons (Use when scales are not available)

Asphalt: .61 (ex. 1000 CY Asphalt = 610 tons. Applies to broken chunks of asphalt)

Concrete: .93 (ex. 1000 CY Concrete = 930 tons. Applies to broken chunks of concrete)

Ferrous Metals: .22 (ex. 1000 CY Ferrous Metal = 220 tons)

Non-Ferrous Metals: .10 (ex. 1000 CY Non-Ferrous Metals = 100 tons)

Drywall Scrap: .20

Wood Scrap: .16

SECTION 01 7419B
CONTRACTOR'S REUSE, RECYCLING, AND DISPOSAL REPORT
(Submit With Each Progress Payment)

Project Title:		
Contract or Work Order No.:		
Contractor's Name:		
Street Address:		
City:	State:	Zip:
Phone: ()	Fax: ()	
E-Mail Address:		
Prepared by: (Print Name)		

Date Submitted:		
Period Covered:	From:	To:

Reuse, Recycling or Disposal Processes Used
<p><i>Describe the types of recycling processes or disposal activities used for material generated in the project. Indicate the type of process or activity by number, types of materials, and quantities that were recycled or disposed in the sections below:</i></p> <p>01 - Reuse of building materials or salvage items on site (i.e. crushed base or red clay brick)</p> <p>02 - Salvaging building materials or salvage items at an off site salvage or re-use center (i.e. lighting, fixtures)</p> <p>03 - Recycling source separated materials on site (i.e. crushing asphalt/concrete for reuse or grinding for mulch)</p> <p>04 - Recycling source separated materials at an off site recycling center (i.e. scrap metal or green matls)</p> <p>05 - Recycling commingled loads of C&D matls at an off site mixed debris recycling center or transfer station</p> <p>06 - Recycling material as Alternative Daily Cover at landfills</p> <p>07 - Delivery of soils or mixed inerts to an inert landfill for disposal (inert fill).</p> <p>08 - Disposal at a landfill or transfer station.</p> <p>09 - Other (please describe) _____</p>

Types of Material Generated
<p><i>Use these codes to indicate the types of material that were generated on the project</i></p> <p>A = Asphalt C = Concrete M = Metals I = Mixed Inert G = Green Matls</p> <p>D = Drywall P/C=Paper/Cardboard W/C = Wire/Cable S= Soils (Non Hazardous)</p> <p>M/C = Miscellaneous Construction Debris R = Reuse/Salvage W = Wood O = Other (describe)</p> <p>Facilities Used: Provide Name of Facility and Location (City)</p> <p>Total Truck Loads: Provide Number of Trucks Hauled from Site During Reporting Period</p> <p>Total Quantities: If scales are available at sites, report in tons. If not, quantify by cubic yards. For salvage/reuse items, quantify by estimated weight (or units).</p>

SECTION I - RE-USED/RECYCLED MATERIALS						
<i>Include all recycling activities for source separated or mixed material recycling centers where recycling occurred.</i>						
Type of Material	Type of Activity	Facilities Used/Location	Total Truck Loads	Total Quantities		
(ex.) M	04	ABC Metals, Los Angeles	24	Tons	Cubic YD	Other Wt.
a. Total Diversion			0	0	0	0

SECTION 01 7419B
CONTRACTOR'S REUSE, RECYCLING, AND DISPOSAL REPORT
Continued

SECTION II - DISPOSED MATERIALS						
<i>Include all disposal activities for landfills, transfer stations, or inert landfills where no recycling occurred.</i>						
Type of Material	Type of Activity	Facilities Used/Location	Total Truck Loads	Total Quantities		
				Tons	Cubic YD	Other Wt.
(ex.) D	08	DEF Landfill, Los Angeles	2	35		
b. Total Disposal				0	0	0

SECTION III - TOTAL MATERIALS GENERATED						
<i>This section calculates the total materials generated during the project period (Reuse/Recycle + Disposal = Generation)</i>						
				Tons	Cubic YD	Other Wt.
a. Total Reused/Recycled				0	0	0
b. Total Disposed				0	0	0
c. Total Generated				0	0	0

SECTION IV - CONTRACTOR'S LANDFILL DIVERSION RATE CALCULATION						
<i>Add totals from Section I + Section II</i>						
	Tons	Cubic Yards	Other Wt.			
a. Materials Re-Used and Recycled	0					
b. Materials Disposed	0					
c. Total Materials Generated (a. + b. = c.)	0	0	0			
d. Landfill Diversion Rate (Tons Only)*	#DIV/0!					

* Use tons only to calculate recycling percentages: Tons Reused/Recycled/Tons Generated = % Recycled

Contractor's Comments (<i>Provide any additional information pertinent to planned reuse, recycling, or disposal activities</i>):						

Notes:

- Suggested Conversion Factors: From Cubic Yards to Tons (Use when scales are not available)
Asphalt: .61 (ex. 1000 CY Asphalt = 610 tons. Applies to broken chunks of asphalt)
Concrete: .93 (ex. 1000 CY Concrete = 930 tons. Applies to broken chunks of concrete)
Ferrous Metals: .22 (ex. 1000 CY Ferrous Metal = 220 tons)
Non-Ferrous Metals: .10 (ex. 1000 CY Non-Ferrous Metals = 100 tons)
Drywall Scrap: .20
Wood Scrap: .16

ALTERATION PROJECT PROCEDURES

PART 1 – GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Integration of Work, Purchase of Materials and Equipment, Uncovering of Work and Non-conforming Work and Correction of Work and Trenches;
- B. Special Conditions.

PART 2 - PRODUCTS

2.01 PRODUCTS FOR PATCHING AND EXTENDING WORK:

- A. New Materials: As specified in the Contract Documents including, without limitation, in the Specifications, Contractor shall match existing products, conditions, and work for patching and extending work.
- B. Type and Quality of Existing Products: Contractor shall determine by inspection, by testing products where necessary, by referring to existing conditions and to the Work as a standard.

PART 3 - EXECUTION

3.01 EXAMINATION:

- A. Contractor shall verify that demolition is complete and that areas are ready for installation of new Work.
- B. By beginning restoration Work, Contractor acknowledges and accepts the existing conditions.

3.02 PREPARATION:

- A. Contractor shall cut, move, or remove items as necessary for access to alterations and renovation Work. Contractor shall replace and restore these at completion.
- B. Contractor shall remove unsuitable material not as salvage unless otherwise indicated in the Contract Documents. Unsuitable material may include, without limitation, rotted wood, corroded metals, and deteriorated masonry and concrete. Contractor shall replace materials as specified for finished Work.

- C. Contractor shall remove debris and abandoned items from all areas of the Site and from concealed spaces.
- D. Contractor shall prepare surface and remove surface finishes to provide for proper installation of new Work and finishes.

3.03 INSTALLATION:

- A. Contractor shall coordinate Work of all alternations and renovations to expedite completion and to accommodate District occupancy.
- B. Designated Areas and Finishes: Contractor shall complete all installations in all respects, including operational, and electrical work.
- C. Contractor shall remove, cut, and patch Work in a manner to minimize damage and to provide a means of restoring Products and finishes to original or specified condition.
- D. Contractor shall refinish visible existing surfaces to remain to specified condition for each material, with a neat and square or straight transition to adjacent finishes.
- E. Contractor shall install products as specified in the Contract Documents, including without limitation, the Specifications.

3.04 TRANSITIONS:

- A. Where new Work abuts or aligns with existing, Contractor shall perform a smooth and even transition. Patched Work must match existing adjacent work in texture and appearance.
- B. When finished surfaces are cut so that a smooth transition with new Work is not possible, Contractor shall terminate existing surface along a straight line at a natural line of division and make a recommendation for resolution to the District and the Architect for review and approval.

3.05 ADJUSTMENTS:

- A. Where a change of plane of 1/4 inch or more occurs, Contractor shall submit a recommendation for providing a smooth transition to the District and the Architect for review and approval.
- B. Contractor shall fit Work at penetrations of surfaces.

3.06 REPAIR OF DAMAGED SURFACES:

- A. Contractor shall patch or replace portions of existing surfaces, which are damaged, lifted, discolored, or showing other imperfections, in the area where the Work is performed.
- B. Contractor shall repair substrate prior to patching finish.

3.07 CULTIVATED AREAS AND OTHER SURFACE IMPROVEMENTS:

- A. Cultivated or planted areas and other surface improvements which are damaged by actions of the Contractor shall be restored by Contractor to their original condition or better, where indicated.
- B. Contractor shall protect and replace, if damaged, all existing guard posts, barricades, and fences.
- C. Contractor shall give special attention to avoid damaging or killing trees, bushes and/or shrubs on the Premises and/or identified in the Contract Documents, including without limitation, the Drawings.

3.08 FINISHES:

- A. Contractor shall finish surfaces as specified in the Contract Documents, including without limitations, the provisions of all Divisions of the Specifications.
- B. Contractor shall finish patches to produce uniform finish and texture over entire area. When finish cannot be matched, Contractor shall refinish entire surface to nearest intersections.

3.09 CLEANING:

- A. Contractor shall continually clean the Site and the Premises as indicated in the Contract Documents, including without limitation, the provisions in the General Conditions and the Specifications regarding cleaning.

END OF DOCUMENT

CONTRACT CLOSEOUT AND FINAL CLEANING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Completion of Work;
- B. Special Conditions;
- C. Temporary Facilities and Controls.

1.02 CLOSEOUT PROCEDURES

Contractor shall comply with all closeout provisions as indicated in the General Conditions.

1.03 FINAL CLEANING

- A. Contractor shall execute final cleaning prior to final inspection.
- B. Contractor shall clean interior and exterior glass and all surfaces exposed to view; remove temporary labels, tape, stains, and foreign substances, polish transparent and glossy surfaces, wax and polish new vinyl floor surfaces, vacuum carpeted and soft surfaces.
- C. Contractor shall clean equipment and fixtures to a sanitary condition.
- D. Contractor shall replace filters of operating equipment.
- E. Contractor shall clean debris from roofs, gutters, down spouts, and drainage systems.
- F. Contractor shall clean Site, sweep paved areas, and rake clean landscaped surfaces.
- G. Contractor shall remove waste and surplus materials, rubbish, and construction facilities from the Site and surrounding areas.

1.04 ADJUSTING

Contractor shall adjust operating products and equipment to ensure smooth and unhindered operation.

1.05 RECORD DOCUMENTS AND SHOP DRAWINGS

- A. Contractor shall legibly mark each item to record actual construction, including:
 - (1) Measured depths of foundation in relation to finish floor datum.
 - (2) Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permit surface improvements.
 - (3) Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.
 - (4) Field changes of dimension and detail.
 - (5) Details not on original Contract Drawings
 - (6) Changes made by modification(s).
 - (7) References to related Shop Drawings and modifications.
- B. Contractor will provide one set of Record Drawings to District.
- C. Contractor shall submit all required documents to District and/or Architect prior to or with its final Application for Payment.

1.06 INSTRUCTION OF DISTRICT PERSONNEL

- A. Before final inspection, at agreed upon times, Contractor shall instruct District's designated personnel in operation, adjustment, and maintenance of products, equipment, and systems.
- B. For equipment requiring seasonal operation, Contractor shall perform instructions for other seasons within six months or by the change of season.
- C. Contractor shall use operation and maintenance manuals as basis for instruction. Contractor shall review contents of manual with personnel in detail to explain all aspects of operation and maintenance.
- D. Contractor shall prepare and insert additional data in Operation and Maintenance Manual when the need for such data becomes apparent during instruction.
- E. Contractor shall review contents of manual with personnel in detail to explain all aspects of operation and maintenance.

1.07 SPARE PARTS AND MAINTENANCE MATERIALS

- A. Contractor shall provide products, spare parts, maintenance, and extra materials in quantities specified in the Specifications and in Manufacturer's recommendations.

- B. Contractor shall provide District with all required Operation and Maintenance Data at one time. Partial or piecemeal submissions of Operation and Maintenance Data will not be accepted.

PART 2 – PRODUCTS Not Used.

PART 3 – EXECUTION Not Used.

END OF DOCUMENT

OPERATION AND MAINTENANCE DATA

PART 1 – GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Completion of the Work;
- B. Special Conditions.

1.02 QUALITY ASSURANCE:

Contractor shall prepare instructions and data by personnel experienced in maintenance and operation of described products.

1.03 FORMAT:

- A. Contractor shall prepare data in the form of an instructional manual entitled "OPERATIONS AND MAINTENANCE MANUAL & INSTRUCTIONS" ("Manual").
- B. Binders: Contractor shall use commercial quality, 8-1/2 by 11 inch, three-side rings, with durable plastic covers; two inch maximum ring size. When multiple binders are used, Contractor shall correlate data into related consistent groupings.
- C. Cover: Contractor shall identify each binder with typed or printed title "OPERATION AND MAINTENANCE MANUAL & INSTRUCTIONS"; and shall list title of Project and identify subject matter of contents.
- D. Contractor shall arrange content by systems process flow under section numbers and sequence of Table of Contents of the Contract Documents.
- E. Contractor shall provide tabbed fly leaf for each separate product and system, with typed description of product and major component parts of equipment.
- F. Text: The content shall include Manufacturer's printed data, or typewritten data on 24 pound paper.
- G. Drawings: Contractor shall provide with reinforced punched binder tab and shall bind in with text; folding larger drawings to size of text pages.

1.04 CONTENTS, EACH VOLUME:

- A. Table of Contents: Contractor shall provide title of Project; names, addresses, and telephone numbers of the Architect, any engineers, subconsultants, Subcontractor(s), and Contractor with name of responsible parties; and schedule of products and systems, indexed to content of the volume.

- B. For Each Product or System: Contractor shall list names, addresses, and telephone numbers of Subcontractor(s) and suppliers, including local source of supplies and replacement parts.
- C. Product Data: Contractor shall mark each sheet to clearly identify specific products and component parts, and data applicable to installation. Delete inapplicable information.
- D. Drawings: Contractor shall supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams. Contractor shall not use Project Record Documents as maintenance drawings.
- E. Text: Contractor shall include any and all information as required to supplement product data. Contractor shall provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions.
- F. Warranties and Bonds: Contractor shall bind in one copy of each.

1.05 MANUAL FOR MATERIALS AND FINISHES:

- A. Building Products, Applied Materials, and Finishes: Contractor shall include product data, with catalog number, size, composition, and color and texture designations. Contractor shall provide information for re-ordering custom manufactured products.
- B. Instructions for Care and Maintenance: Contractor shall include Manufacturer's recommendations for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.
- C. Moisture Protection and Weather Exposed Products: Contractor shall include product data listing applicable reference standards, chemical composition, and details of installation. Contractor shall provide recommendations for inspections, maintenance, and repair.
- D. Additional Requirements: Contractor shall include all additional requirements as specified in the Specifications.
- E. Contractor shall provide a listing in Table of Contents for design data, with tabbed fly sheet and space for insertion of data.

1.06 MANUAL FOR EQUIPMENT AND SYSTEMS:

- A. Each Item of Equipment and Each System: Contractor shall include description of unit or system, and component parts and identify function, normal operating characteristics, and limiting conditions. Contractor shall include performance curves, with engineering data and tests, and complete nomenclature, and commercial number of replaceable parts.
- B. Panelboard Circuit Directories: Contractor shall provide electrical service characteristics, controls, and communications.

- C. Contractor shall include color coded wiring diagrams as installed.
- D. Operating Procedures: Contractor shall include start-up, break-in, and routine normal operating instructions and sequences. Contractor shall include regulation, control, stopping, shut-down, and emergency instructions. Contractor shall include summer, winter, and any special operating instructions.
- E. Maintenance Requirements: Contractor shall include routine procedures and guide for trouble-shooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.
- F. Contractor shall provide servicing and lubrication schedule, and list of lubricants required.
- G. Contractor shall include manufacturer's printed operation and maintenance instructions.
- H. Contractor shall include sequence of operation by controls manufacturer.
- I. Contractor shall provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.
- J. Contractor shall provide control diagrams by controls manufacturer as installed.
- K. Contractor shall provide Contractor's coordination drawings, with color coded piping diagrams as installed.
- L. Contractor shall provide charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams.
- M. Contractor shall provide list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.
- N. Additional Requirements: Contractor shall include all additional requirements as specified in Specification(s).
- O. Contractor shall provide a listing in Table of Contents for design data, with tabbed fly sheet and space for insertion of data.

1.07 SUBMITTAL:

- A. Contractor shall submit to the District for review two (2) copies of preliminary draft or proposed formats and outlines of the contents of the Manual within thirty (30) days of Contractor's start of Work.
- B. For equipment, or component parts of equipment put into service during construction and to be operated by District, Contractor shall submit draft content for that portion of the Manual within ten (10) days after acceptance of that equipment or component.

- C. Contractor shall submit two (2) copies of a complete Manual in final form prior to final Application for Payment. Copy will be returned with Architect/Engineer comments. Contractor must revise the content of the Manual as required by District prior to District's approval of Contractor's final Application for Payment.
- D. Contractor must submit two (2) copies of revised Manual in final form within ten (10) days after final inspection.

PART 2 – PRODUCTS Not Used.

PART 3 – EXECUTION Not Used.

END OF DOCUMENT

WARRANTIES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Warranty/Guarantee Information;
- B. Special Conditions.

1.02 FORMAT

- A. Binders: Contractor shall use commercial quality, 8-1/2 by 11 inch, three-side rings, with durable plastic covers; two inch maximum ring size.
- B. Cover: Contractor shall identify each binder with typed or printed title "WARRANTIES" and shall list title of Project.
- C. Table of Contents: Contractor shall provide title of Project; name, address, and telephone number of Contractor and equipment supplier; and name of responsible principal. Contractor shall identify each item with the number and title of the specific Specification, document, provision, or section in which the name of the product or work item is specified.
- D. Contractor shall separate each warranty with index tab sheets keyed to the Table of Contents listing, providing full information and using separate typed sheets as necessary. Contractor shall list each applicable and/or responsible Subcontractor(s), supplier(s), and/or manufacturer(s), with name, address, and telephone number of each responsible principal(s).

1.03 PREPARATION:

- A. Contractor shall obtain warranties, executed in duplicate by each applicable and/or responsible subcontractor(s), supplier(s), and manufacturer(s), within ten (10) days after completion of the applicable item or work. Except for items put into use with District's permission, Contractor shall leave date of beginning of time of warranty blank until the date of completion is determined.
- B. Contractor shall verify that documents are in proper form, contain full information, and are notarized, when required.
- C. Contractor shall co-execute submittals when required.
- D. Contractor shall retain warranties until time specified for submittal.

1.04 TIME OF SUBMITTALS:

- A. For equipment or component parts of equipment put into service during construction with District's permission, Contractor shall submit a draft warranty for that equipment or component within ten (10) days after acceptance of that equipment or component.
- B. Contractor shall submit for District approval all warranties and related documents within ten (10) days after date of completion. Contractor must revise the warranties as required by the District prior to District's approval of Contractor's final Application for Payment.
- C. For items of work delayed beyond date of completion, Contractor shall provide an updated submittal within ten (10) days after acceptance, listing the date of acceptance as start of warranty period.

PART 2 - PRODUCTS Not Used.

PART 3 – EXECUTION Not Used.

END OF DOCUMENT

(Letterhead of Contractor)

STANDARD GUARANTEE / WARRANTY

for

Project Name

Contract No.

We hereby warrant that the Work we have provided under the above reference Contract has been completed in accordance with the Drawings, Specifications, and other Contract Documents.

Under the terms of this warranty, we agree to repair or replace any or all of our work, together with any other adjacent work which may be displaced or damaged by so doing, which may prove to be either patently defective in its workmanship or latently defective in its workmanship or materials within the period of 24 months from the date of filing of the Notice of Completion of the above named Project by the Board of Trustees of the School District, and we also agree to repair any and all damages resulting from such defects, without any expense whatsoever to said Board of Trustees, ordinary wear and tear and unusual abuse or neglect excepted.

In the event of our failure to comply with above-mentioned guarantee conditions within ten (10) day after being notified in writing by the Owner, we collectively and separately do hereby authorize the Owner to have said defective work and damages repaired or replaced and made good at our expense and will honor and pay the costs and charges therefore upon demand.

SIGNED (Contractor) _____

(Address)

(Printed Name of Authorized Representative)

Signature

(License Number)

(Date of Signing)

COUNTERSIGNED (Owner) _____

(Printed Name of Authorized Representative)

Signature

Date of Filing or Notice of Completion: _____

(Letterhead of Company)

SUBCONTRACTOR STANDARD GUARANTEE / WARRANTY

We hereby warrant that

which we have provided in _____

for _____

has been completed in accordance with Specification Section _____ and requirements of the Contract Documents.

Under the terms of this warranty, we agree to repair or replace any or all of our work, together with any other adjacent work which may be displaced or damaged by so doing, which may prove to be either patently defective in its workmanship or latently defective in its workmanship or materials within a period of 24 months from date of filing the Notice of Completion of the above-named Project by the Board of Trustees of the School District without any expense whatsoever to said Board of Trustees, ordinary wear and tear and unusual abuse or neglect excepted.

In the event of our failure to comply with above-mentioned guarantee conditions within ten (10) day after being notified in writing by the Owner, we collectively and separately do hereby authorize the Owner to have said defective work and damages repaired or replaced and made good at our expense and will honor and pay the costs and charges therefore upon demand.

SIGNED (Subcontractor)

(Signature)

(Company Name)

(Address)

(License Number) _____ (Date of Signing)

COUNTERSIGNED (General Contractor)

(Signature)

(Company Name)

(Address)

(License Number) _____ (Date of Signing)

(Letterhead of Company)

SPECIAL EXTENDED WRITTEN GUARANTEE / WARRANTY

We hereby warrant that

which we have provided in _____
Name of Project

for _____
District

has been completed in accordance with Specification Section _____ and requirements of the Contract Documents.

Under the terms of this warranty, we agree to repair or replace any or all of our work, together with any other adjacent work which may be displaced or damaged by so doing, which may prove to be either patently defective in its workmanship or latently defective in its workmanship or materials within a period of _____ year(s) from date of filing the Notice of Completion of the above-named Project by the Board of Trustees of the School District without any expense whatsoever to said Board of Trustees, ordinary wear and tear and unusual abuse or neglect excepted. We also agree to repair any and all damages resulting from such defects.

In the event of our failure to comply with above-mentioned conditions within a reasonable time but in no case longer than ten (10) calendar days after being notified in writing by the Owner, we collectively and separately do hereby authorize the Owner to have said defective work and damages repaired or replaced and made good at our expense and will honor and pay the costs and charges therefore upon demand.

SIGNED (Subcontractor)

(Name)

(Address)

(License Number) (Date of Signing)

COUNTERSIGNED (General Contractor)

(Name)

(Address)

(License Number) (Date of Signing)

RECORD DOCUMENTS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Documents on Work;
- B. Special Conditions.

PART 2 - RECORD DRAWINGS

2.01 GENERAL:

- A. As indicated in the Contract Documents, the District will provide Contractor with one set of reproducible, full size original Contract Drawings (mylars).
- B. Contractor shall maintain at each Project Site one set of marked-up plans and shall transfer all changes and information to those marked-up plans, as often as required in the Contract Documents, but in no case less than once each month. Contractor shall submit to the Project Inspector one set of reproducible vellums of the Project Record Drawings ("As-Built") showing all changes incorporated into the Work since the preceding monthly submittal. The As-Built shall be available at the Project Site. The Contractor shall submit reproducible vellums at the conclusion of the Project following review of the blue line prints.
- C. Label and date each Record Drawing "RECORD DOCUMENT" in legibly printed letters.
- D. All deviations in construction, including but not limited to pipe and conduit locations and deviations caused by without limitation Change Orders, Construction Claim Directives, RFI's, and Addenda, shall be accurately and legibly recorded by Contractor.
- E. Locations and changes shall be done by Contractor in a neat and legible manner and, where applicable, indicated by drawing a "cloud" around the changed or additional information.

2.02 RECORD DRAWING INFORMATION:

- A. Contractor shall record the following information:
 - (1) Locations of Work buried under or outside each building, including, without limitation, all utilities, plumbing and electrical lines, and conduits.

- (2) Actual numbering of each electrical circuit to match panel schedule.
- (3) Locations of significant Work concealed inside each building whose general locations are changed from those shown on the Contract Drawings.
- (4) Locations of all items, not necessarily concealed, which vary from the Contract Documents.
- (5) Installed location of all cathodic protection anodes.
- (6) Deviations from the sizes, locations, and other features of installations shown in the Contract Documents.
- (7) Locations of underground work, points of connection with existing utilities, changes in direction, valves, manholes, catch basins, capped stubouts, invert elevations, etc.
- (8) Sufficient information to locate Work concealed in each building with reasonable ease and accuracy.

In some instances, this information may be recorded by dimension. In other instances, it may be recorded in relation to the spaces in the building near which it was installed.

- B. Contractor shall provide additional drawings as necessary for clarification.
- C. Contractor shall provide reproducible record drawings, made from final Shop Drawings marked "No Exceptions Taken" or "Approved as Noted."
- D. After review and approval of the marked-up specifications by the Project Inspector, Contractor shall provide electronic copies of the drawings (in PDF format) with one file with all of the sheets and one set of individual sheet files at the conclusion of the Project.

PART 3 - RECORD SPECIFICATIONS

3.01 GENERAL:

- A. Contractor shall mark each section legibly to record manufacturer, trade name, catalog number, and supplier of each Product and item of equipment actually installed.
- B. After review and approval of the marked-up specifications by the Project Inspector, Contractor shall provide one electronic copy of the specifications (in PDF format) at the conclusion of the Project.

PART 4 - MAINTENANCE OF RECORD DOCUMENTS

4.01 GENERAL

- A. Contractor shall store Record Documents apart from documents used for construction as follows:

- (1) Provide files and racks for storage of Record Documents.
- (2) Maintain Record Documents in a clean, dry, legible condition and in good order.

B. Contractor shall not use Record Documents for construction purposes.

PART 5 – PRODUCTS Not Used.

END OF DOCUMENT

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes general requirements and procedures for compliance with California Code of Regulations, Title 24, Part 11 California Green Building Standards Code, "CAL-Green".

- 1. Chapter 5- Non-Residential Mandatory Measures.

1.2 RELATED REQUIREMENTS

- A. Pertinent sections specifying erosion control.
- B. Section 01 6116, Volatile Organic Compound (VOC) Restrictions.
- C. Section 01 7419, Construction Waste Management and Disposal.
- D. Section 01 7700, Closeout Procedures.

1.3 DEFINITIONS

- A. CAL-Green Definitions: Certain terms are defined by CAL-Green in Chapter 5 of the code. Words and terms used in this section shall have the meanings shown therein.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Respond to questions and requests from Architect and the jurisdiction having authority regarding CAL-Green credits that are the responsibility of the Contractor, that depend on product selection or product qualities, or that depend on Contractor's procedures. Document responses as informational submittals.

1.5 SUBMITTALS

- A. CAL-GREEN Submittals: Submit CAL-GREEN submittals required by code and in other Specification Sections.
 - 1. CAL-GREEN submittals are in addition to other submittals. If submitted item is identical to that submitted to comply with other requirements, submit duplicate copies as a separate submittal to verify compliance with indicated CAL-GREEN requirements.
 - 2. Acceptable verification submittals are specified in the related sections.

SUSTAINABLE DESIGN REQUIREMENTS
SECTION 01 8113.10
3595001

PART 2 - PRODUCTS

2.1 REQUIREMENTS - GENERAL

- A. Provide products and procedures necessary to confirm CAL-GREEN compliance required in this Section. Although other Sections may specify some CAL-GREEN requirements, the Contractor shall determine additional materials, techniques, means, methods and procedures necessary to comply with CAL-GREEN requirements.

2.2 STORM WATER POLLUTION PREVENTION PLAN

- A. Section 5.106.1: Comply with requirements of this code section, local ordinances, General Conditions, Special Provisions, and related sections specifying erosion control.

2.3 OUTDOOR WATER USE

- A. Section 5.304.3.1: Irrigation Controllers: Comply with requirements of this code section, local ordinances and Section 32 8000.

2.4 CONSTRUCTION WASTE REDUCTION

- A. Section 5.408 Construction Waste Management, Diversion and Recycling: Comply with requirements of this code section, local ordinances and Section 01 7419.

2.5 BUILDING MAINTENANCE AND OPERATION

- A. Section 5.410.2.5. Documentation and Training: Provide Operations Training as required by these code sections and as specified in Section 01 7700 and Systems Manual as specified in Section 01 7700.

2.6 POLLUTANT CONTROL

- A. Section 5.504.3 Indoor Air Quality: Comply with requirements of this code section, local ordinances and Section 01 3543.
 - 1. During storage, rough installation and until final start-up of HVAC equipment, securely cover all ducts and air distribution component openings with plastic, tape, sheet metal or other methods acceptable to enforcing agency to reduce dust or debris collected in the system.
- B. Section 5.504.4 Finish Material Pollutant Control: All Finish materials shall comply with requirements of this code section, local ordinances and Section 01 6116.

PART 3 - EXECUTION

3.1 GENERAL

- A. Comply with Section 01 7419, Construction Waste Management and Disposal.

SUSTAINABLE DESIGN REQUIREMENTS
SECTION 01 8113.10
3595001

- B. Comply with execution requirements of related sections and applicable local codes and ordinances.

END OF SECTION

*p:\sacramento\3595 tracy unified school district\001-000_villalovoz es new shade structures\08 specifications\06 spec\04 final\freiler
- shade struct\01 8113.10_sustainable design requirements (cal-green).docx
Last Updated: April 8, 2019*

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Engineered fill materials.
 - 2. Imported engineered fill material.
 - 3. Landscape backfill material'
 - 4. Decomposed granite.
 - 5. Aggregate base.

1.2 RELATED REQUIREMENTS

- A. Section 01 5000, Temporary Facilities and Controls.
- B. Section 01 8113, Sustainable Design Requirements, for CAL-Green **[and Collaborative for High Performance Schools (CHPS)]** general requirements and procedures.
- C. Section 31 2333, Trenching and Backfilling.
- D. Section 32 1200, Asphalt Concrete Paving.
- E. Section 32 1600, Site Concrete.
- F. Section 33 0000, Utilities
- G. Section 33 4000, Storm Drainage Utilities.

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CAL Green), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- C. Local Jurisdiction: Any work within the street, highway or right-of-way shall be performed in accordance with the requirement of the governmental agencies having jurisdiction, and shall not begin until all of those governing authorities have been notified.
- D. ASTM International (ASTM):
 - 1. D698-00 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures, Using 5.5 lb (2.49 Kg) Rammer and 12 inch (304.8 mm) Drop.
 - 2. D1556-00 - Test Method for Density of Soil in Place by the Sand-Cone Method.
 - 3. D1557-02e2 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 10 lb. (4.54 Kg) Rammer and 18 inch (457 mm) Drop.

EARTHWORK
SECTION 31 0000
3595001

4. D3017-05 Test Methods for Moisture Content of Soils and Soil-Aggregate Mixture by Nuclear Methods (Shallow Depth).
5. D422-63(2007) e1 Test Method for Particle Size Analysis of Soil.
6. D4318-05 Test Method for Liquid Limit, Plastic Limit, and Plasticity Limit.

E. CALTRANS Standard Specifications Section 17.

F. CAL-OSHA, Title 8, Section 1590 (e).

1.4 ADMINISTRATION REQUIREMENTS

A. Submittal Procedures:

1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
3. Sustainable Design Submittals shall comply with the additional requirements of Section 01 8113, Sustainable Design Requirements.

B. Site Visitation: All bidders interfacing with existing conditions shall visit the site prior to bid to verify general conditions of improvements. Discrepancies must be reported prior to the bid for clarification.

1.5 ACTION SUBMITTALS

A. Provide supplier's descriptive literature for all products to demonstrate compliance with specified attributes.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Contractor / Installer.

1.7 CLOSEOUT SUBMITTALS

A. Guarantee: Submit subcontractor's guarantee.

1.8 QUALITY ASSURANCE

- A. Contractor / Installer shall have been in business for five (5) years providing/finishing similar size projects and complexity.
- B. Contractor shall be solely responsible for all subgrades built. Failures resulting from inadequate compaction or moisture content are the responsibility of the contractor. Contractor shall be solely responsible for any and all repairs.
- C. The representatives of the Owner's testing lab will not act as supervisor of construction, nor will they direct construction operations. Neither the presence of the Owner's testing lab representatives nor the testing by the Owner's testing lab shall excuse the contractors or subcontractors for defects discovered in their work during or following completion of

the project. Correcting of inadequate compaction or moisture content is the sole responsibility of the contractor.

- D. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.
- E. All materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.
- F. Tests (See Part 3, Article "Testing and Observation" for Compaction Testing).

1.9 DELIVERY, STORAGE AND HANDLING

- A. Transport, store and handle in strict accord with the local jurisdiction.

1.10 FIELD CONDITIONS

1.11 EXISTING SITE CONDITIONS

- A. Contractor shall acquaint himself with all site conditions. If unknown active utilities are encountered during work, notify Architect promptly for instructions. Failure to notify will make Contractor liable for damage to these utilities arising from Contractor's operations subsequent to discovery of such unknown active utilities.
- B. Existing civil, mechanical and electrical improvements are shown on respective site plans to the extent known. Should the Contractor encounter any deviation between actual conditions and those shown, he is to immediately notify the Architect before continuing work.

1.12 ON SITE UTILITY VERIFICATION AND REPAIR PROCEDURES

- A. Ground-breaking requirements:
 - 1. All underground work performed by a Contractor must be authorized by the District's Construction Manager or the Low Voltage Consultant prior to start of construction.
 - 2. The Contractor is to obtain and keep the original School's construction utility site plans on site during all excavation operations. Contractor can contact the District's Construction Manager, Facilities Manager, or the Low Voltage Consultant to procure the drawings.
- B. Underground Utility Locating:
 - 1. The contractor shall hire an Underground Utility Locating Service to locate existing underground utility pathways in areas effected by the scope of work for excavation.
 - 2. Contractor must use an underground utility locator service with a minimum of 3 years experience. The equipment operator must have demonstrated experience. Contact Norcal Underground Locating (800/986-6722) or Precision Locating (800/577-7324)

EARTHWORK
SECTION 31 0000
3595001

3. The Underground Utility Locator Service must have the use of equipment with the ability to locate by means of inductive clamping, induction, inductive metal detection, conductive coupling, or TransOnde (Radiodetection) to generate signals, passive locating (free scoping) for "hot" electric, and metal detector.
4. The Underground Utility Locator Service must be able to locate existing utilities at a depth of at least 72".
5. The Underground Utility Locator Service must be able to locate but are not limited to locating the following types of utility pathways:
 - a. All conduit pathways containing 110 volt or greater 50-60Hz electrical wire.
 - b. All conduit pathways containing an active cable TV system.
 - c. All conduit pathways containing wire or conductor in which a signal can be attached and generated without damaging or triggering the existing systems.
 - d. All empty conduit pathways or pipe in which a signal probe or sonde (miniature transmitter) can be inserted.
 - e. All conduit pathways containing non-conductive cables or wires in which a signal probe or sonde (miniature transmitter) can be inserted.
 - f. All plastic and other nonconductive water lines in which a TransOnde Radiodetection) or other "transmitter" can be applied to create a low frequency pressure wave (signal) without damaging or triggering the existing systems.
 - g. All copper or steel waterlines and plastic or steel gas lines.
6. All markings made by the Underground Utility Locator Service or other shall be clear and visible.
7. The contractor shall maintain all markings made by Underground Utility Locator Service or other throughout the entire length of the project.
8. The Underground Utility Locator Service shall provide the contractor with two sets of maps showing the location of utilities and average depth. They will be referenced to permanent buildings. Contractor will deliver one copy to the district at no additional charge.
9. Contractor is responsible to contact Underground Service Alert (U.S.A. 800/227-2600) and receive clearance prior to any excavation operations.
10. Contractor shall inform the (District's Construction Manager)(Architect)(Owner) no later than five (5) days prior to the date scheduled for the utility locator service to be on site.

1.13 PROTECTION

- A. Adequate protection measures shall be provided to protect workmen and passers-by on and off the site. Adjacent property shall be fully protected throughout the operations. Blasting will not be permitted. Prevent damage to adjoining improvements and properties both above and below grade. Restore such improvements to original condition should damage occur. Replace trees and shrubs outside building area disturbed by operations.
- B. In accordance with generally accepted construction practices, the Contractor shall be solely and completely responsible for working conditions at the job site, including safety

of all persons and property during performance of the work. This requirement shall apply continuously and shall not be limited to normal working hours.

- C. Any construction review of the Contractor's performance conducted by the Geotechnical Engineer is not intended to include review of the adequacy of the Contractor's safety measures, in, on, or near the construction site.
- D. Provide shoring, sheeting, sheet piles and or bracing to prevent caving, erosion or gullyng of sides of excavation.
- E. Surface Drainage: Provide for surface drainage during period of construction in manner to avoid creating nuisance to adjacent areas. The contractor shall make a reasonable effort on a daily basis to keep all excavations and the site free from water during entire progress of work, regardless of cause, source, or nature of water.
- F. Adjacent streets and sidewalks shall be kept free of mud, dirt or similar nuisances resulting from earthwork operations.
- G. The site and adjacent influenced areas shall be watered as required to suppress dust nuisance. Dust control measures shall be in accordance with the local jurisdiction.
- H. Trees: Carefully protect existing trees that are to remain. Provide temporary irrigation as necessary to maintain health of trees.

1.14 SEASONAL LIMITS

- A. No fill material shall be placed, spread or rolled during unfavorable weather conditions. When work is interrupted by rains, fill operations shall not be resumed until field tests indicate that moisture content and density of fill are satisfactory.
- B. Excessively wet fill material shall be bladed and aerated per Article "Subgrade Preparation".

1.15 TESTING

- A. General: Refer to Section 01 4523 - TESTING AND INSPECTION SERVICES, AND STRUCTURAL TESTS AND INSPECTIONS LIST, DSA-103.
- B. Geotechnical Engineer: Owner is retaining a Geotechnical Engineer to determine compliance of fill with Specifications, and to direct adjustments in fill operations. Costs of Geotechnical Engineer will be borne by Owner; except those costs incurred for re-tests or re-inspection will be paid by Owner and backcharged to Contractor.
 - 1. If Contractor elects to process or mine onsite materials for use as Suitable Fill, Aggregate Sub Base, Aggregate Base, Rock, Crushed Rock or sand the cost of all testing of this material shall be paid for by the Contractor.
 - 2. Testing of import fill for compliance with Department of Toxic Substance Control (DTSC) shall be paid for by the Contractor.

**EARTHWORK
SECTION 31 0000
3595001**

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Engineered Fill Materials: All fill shall be of approved local materials supplemented by imported fill if necessary. "Approved" local materials are defined as local soils tested and approved by Geotechnical Engineer free from debris, and concentrations of clay and organics; and contain rocks no larger than 3-inches in greatest dimension. The soil and rock should be thoroughly blended so that all rock is surrounded by soil. This may require mixing of the soil and rock with a dozer prior to placement and compaction. Clods, rocks, hard lumps or cobbles exceeding 3-inches in final size shall not be allowed in the upper 6 inches of any fill. Native clay or clayey soils will not be permitted within the upper 12 inches of building pad areas or paved areas.
- B. Imported Engineered Fill Material: Imported fill may be required to complete work. Proposed import fill material shall meet the above requirements; shall be similar to the native soils. Import fill shall meet the above requirements; shall have plasticity index of 20 or less; an Expansion Index of 15 or less; be free of particles greater than 3-inch (3") in largest dimension; be free of contaminants and have corrosion characteristics within the acceptable limits. All import fill material shall be tested and approved by Soils Engineer prior to transportation to the site. Proposed fill material shall comply with DTSC guidelines to include Phase 1 environmental site assessment and related tests. Refer to the October 2001 DTSC Information Advisory for clean imported fill material.
1. DTSC TESTING: Site work contractor is to coordinate testing with an analytical lab, hired by the owner, licensed by the State of California for the DTSC testing. The costs associated with testing will be paid by the contractor.
 2. DTSC testing shall include documentation as to the previous land use, location, and history. Soils shall be analyzed for all compounds of concern to ensure the imported soil is uncontaminated and acceptable. Testing shall be performed per the recommendations included in DTSC Imported Fill Advisory (http://www.dtsc.ca.gov/Schools/upload/SMP_FS_Cleanfill-Schools.pdf). Soils shall be tested prior to import to the project site.
 3. Lab shall determine geographically which tests and analysis comparison will be appropriate for the testing. (CAM 17 / Title 22); (RWQCB) Regional Water Quality Control Board; or (OEHHA) Office of Environmental Health Hazard Assessment.
 4. Frequency of testing shall be conducted in accordance with DTSC's Imported Fill Advisory as follows;

Fill Material Sample Schedule	
Area Of Individual Borrow Area	Sampling Requirements
2 Acres or less	Minimum of 4 samples
2 to 4 Acres	Minimum of 1 sample every ½ acre
4 to 10 Acres	Minimum of 8 samples

**EARTHWORK
SECTION 31 0000
3595001**

Greater than 10 Acres	Minimum of 8 locations with 4 subsamples per location
-----------------------	---

Volume of Borrow Area Stockpile	
Up to 1,000 Cubic Yards	1 sample per 250 cubic yards
1,000 to 5,000 Cubic Yards	4 samples for the first 1000 cubic yards + 1 sample per each additional 500 cubic yards
Greater than 5,000 Cubic Yards	12 samples for the first 5,000 cubic yards + 1 sample per each additional 1,000 cubic yards

5. Reports/ Documentation
 - a. Results of the testing analysis shall be sent to the Owner; Architect; Project Inspector, Project Civil Engineer, DTSC, and DSA. Letter shall reference DSA file and application numbers.
- C. Landscape Backfill Material:
 1. The top 3" of native topsoil stripped from the site may be used for landscape backfill material.
- D. Water: Furnish all required water for construction purposes, including compaction and dust control. Water shall be potable.
- E. Aggregate Base: Provide Class 2 3/4" Aggregate Base conforming to standard gradation as specified in Cal Trans Standard Specifications, Section 26,-1.02A.
- F. Decomposed Granite: Decomposed Granite shall be well graded mixture of fine to 1/8" particles in size with no clods. The material shall be free of vegetation, other soils, debris and rock. The material shall be redish-tan to tan in color.
- G. Decomposed Granite Solidifier: PolyPavement or equal.

PART 3 - EXECUTION

3.1 INSPECTION LAYOUT AND PREPARATION

- A. Prior to installation of the work of this Section, carefully inspect and verify by field measurements that installed work of all other trades is complete to the point were this installation may properly commence
- B. Layout all work, establish grades, locate existing underground utilities, set markers and stakes, setup and maintain barricades and protection facilities; all prior to beginning

**EARTHWORK
SECTION 31 0000
3595001**

actual earthwork operations. Layout and staking shall be done by a licensed Land Surveyor or Professional Civil Engineer.

- C. Verify that specified items may be installed in accordance with the approved design.
- D. In event of discrepancy, immediately notify Owner and the Architect. Do not proceed in discrepant areas until discrepancies have been fully resolved.

3.2 PERFORMANCE

A. GENERAL:

- 1. General: Do all grading, excavating and cutting necessary to conform finish grade and contours as shown. All cuts shall be made to true surface of subgrade.
- 2. Archaeological Artifacts: Should any artifacts of possible historic interest be encountered during earthwork operations, halt all work in area of discovery and immediately contact the Architect for notification of appropriate authorities.
- 3. Degree of Compaction: Percentage of maximum density, hereinafter specified as degree of compaction required, means density equivalent to that percentage of maximum dry density determined by ASTM D1557 Compaction Test method, and such expressed percentage thereof will be minimum acceptable compaction for specified work.
- 4. Moisture Content: Moisture content shall be as noted below and as called for on the plans. Moisture content shall be maintained until subgrade is covered by surfacing materials.

3.3 DEMOLITION, DISPOSAL AND DISPOSITION OF UNDESIRABLE MAN-MADE FEATURES

- A. All other obstructions, such as abandoned utility lines, septic tanks, concrete foundations, and the like shall be removed from site. Excavations resulting from these removal activities shall be cleaned of all loose materials, dish shaped, and widened as necessary to permit access for compaction equipment. Areas exposed by any required over-excavation should be scarified to a depth of 12", moisture-conditioned to near optimum moisture content, and recompacted to at least 95% of the maximum dry density.

3.4 TESTING AND OBSERVATION

- A. All grading and earthwork operations shall be observed by the Geotechnical Engineer or his representative, serving as the representative of the Owner.
- B. Field compaction tests shall be made by the Geotechnical Engineer or his representative. If moisture content and/or compaction are not satisfactory, Contractor will be required to change equipment or procedure or both, as required to obtain specified moisture or compaction. Notify Geotechnical Engineer at least 48 hours in advance of any filling operation.
- C. Earthwork shall not be performed without the notification or approval of the Geotechnical Engineer or his representative. The Contractor shall notify the Geotechnical Engineer at least two (2) working days prior to commencement of any aspect of the site earthwork.

- D. If the Contractor should fail to meet the compaction or design requirements embodied in this document and on the applicable plans, he shall make the necessary readjustments until all work is deemed satisfactory, as determined by the Geotechnical Engineer or Architect/Engineer.
- E. After each rain event Geotechnical Engineer shall test fill material for optimum moisture. Do not place any fill material until desired moisture is achieved.

3.5 CLEARING AND GRUBBING

- A. Prior to grading, remove all debris off-site. Remove trees and brush including the root systems. Holes resulting from tree and brush removal should be prepared and backfilled in accordance with paragraphs 3.7, 3.8, 3.9, and 3.10. This may require deepening and/or widening the holes to adequately remove disturbed soil and provide room for compaction equipment. Strip the surface of all organics. Strippings meeting the requirements of Section 32 9000 may be used in landscape areas only.

3.6 CUTTING

- A. Building pads that are located within a cut/fill transition area will have to be overexcavated to provide a semi-uniform fill beneath the building pad. The portions of building pads located in cut areas shall be overexcavated to provide no more than 1 foot difference in fill placed in the same building pad.
- B. Do all cutting necessary to bring finish grade to elevations shown on Drawings.
- C. When excavation through roots is necessary, cut roots by hand.
- D. Carefully excavate around existing utilities to avoid unnecessary damage. The contractor shall anticipate and perform hand work near existing utilities as shown on the survey, without additional claims or cost.

3.7 STRUCTURAL EXCAVATION

- A. General: Excavate to bear on firm material at contract depth shown on Structural Drawings.
- B. Footings: All footing excavations shall be of sufficient width for installation of formwork, unless earth will retain its position during concreting. All portions of footings above grade must be formed. In the event that footings are placed against earth, footing widths below grade shall be increased 2 inches from those shown on Drawings and positive protection shall be provided for top corners of trench.
- C. Unsuitable Ground: Any errors in structural excavation, soft ground, or clay soils found when excavating shall be reported to Architect. In no case shall work be built on any such soft or clayey unsuitable surface without direction from the Architect. Restore excavations to proper elevation with engineered fill material compacted to 95% of dry density.

**EARTHWORK
SECTION 31 0000
3595001**

3.8 SUBGRADE PREPARATION

- A. Grade compact and finish all subgrades within a tolerance of 0.10' of grades as indicated on Drawings and so as not to pool water. Subgrade within building pads and concrete walks shall be within 0.05' of grades indicated.
- B. After clearing, grubbing and cutting, subsurface shall be plowed or scarified to a depth of at least 12", until surface is free from ruts, hummocks or other uneven features. Moisture condition to 2% above optimum moisture content and recompact to at least 95% of the maximum dry density as determined by ASTM Test Method D1557. If the existing soils are at a water content higher than specified, the contractor shall provide multiple daily aerations by ripping, blading, and/or discing to dry the soils to a moisture content where the specified degree of compaction can be achieved. After seven consecutive working days of daily aerations, and the moisture content of the soil remains higher than specified, the contractor shall notify the architect. If the existing soils have a moisture content lower than specified, the contractor shall scarify, rip, water and blade existing soil to achieve specified moisture content. The contractor shall make proper allowance in schedule and methods to complete this work.
- C. After subgrade for fill within building pad area or within paved areas has been cleared, plowed and scarified, it shall be disked or bladed until uniform and free from large clods, brought to 2% above optimum moisture content and compacted to not less than 95% of maximum dry density, as determined by ASTM Test Method D1557, and such expressed percentage thereof will be minimum acceptable density for specified work.
- D. Subgrade in areas to receive landscaping shall be compacted to (85%).
- E. Where Contractor over-excavates building pads through error, resulting excavation shall be recompacted as engineered fill at Contractor's expense.

3.9 PLACING, SPREADING AND COMPACTING FILL MATERIAL IN BUILDING PAD AND PAVEMENT AREAS

- A. Selected fill material shall be placed in layers which, when compacted, shall not exceed 6 inches in compacted thickness. Each layer shall be spread evenly and thoroughly mixed to insure uniformity in moisture content.
- B. Selected fill material shall be moisture-conditioned to specified moisture content. Selected fill material shall be unfrozen. When moisture content of fill material is below that specified, add water until proper moisture content is achieved. When moisture content is above that specified, aerate by blading or other methods mentioned in 3.08 B until moisture content is satisfactory.
- C. After each layer has been placed, mixed and spread evenly, it shall be thoroughly compacted to a minimum of 90% as determined by the ASTM D1557 Compaction Test. Compact each layer over its entire area until desired density has been obtained.
- D. Recomposition of Fill in Trenches and Compaction of Fill Adjacent to Walls: Where trenches must be excavated, backfill with material excavated. Place in lifts that when compacted do not exceed 6", moisture conditioned to (optimum)(2% above optimum)

moisture content, and compact to a minimum of 90% relative compaction in building pad and paved areas, and to 90% relative compaction in landscape areas.

- E. Jetting of fill materials will not be allowed.

3.10 FINAL SUBGRADE COMPACTION

- A. Building Pads: Upper 12" of all final building pad subgrades (including future buildings) shall be uniformly compacted at specified moisture content to at least 90% of maximum dry density, as determined by ASTM D1557 Compaction Test, regardless of whether final subgrade elevation is attained by filling, excavation, or is left at existing grade. After acceptance of final compaction test, contractor shall maintain the required moisture content of subgrade until concrete flatwork is placed.
- B. Paved Areas: Upper 12" of all final subgrades supporting pavement sections and all other flatwork shall be brought to specified moisture content and shall be uniformly compacted to not less than 95% of maximum dry density, regardless of whether final subgrade elevation is attained by filling, excavation, or is left at existing grade. After acceptance of final compaction test, contractor shall maintain the required moisture content of subgrade until concrete flatwork is placed.
- C. Other Fill and Backfill: Upper 12" of all other final subgrades or finish grades shall be compacted to 90% of maximum dry density.
- D. Gravel Fill: Do not place compacted gravel fill until after underground work and foundations are in place. Compact gravel fill with vibratory plate or similar equipment to preclude settlement.

3.11 PLACING, SPREADING, AND COMPACTION OF LANDSCAPE BACKFILL MATERIALS

- A. All landscaped areas shall receive topsoil. After subgrade under landscape area has been scarified and brought to 85% maximum dry density, top soil shall be placed evenly to depth of 12" at 85% of maximum dry density.
- B. Project Inspector must verify that materials are uniformly spread to minimum depth specified.

3.12 SLOPE CONSTRUCTION

- A. Cut slopes shall be constructed to no steeper than 2:1(horizontal:vertical). Fill slopes shall be constructed to no steeper than 2:1 (horizontal:vertical). Prior to placement of fill on an existing slope the existing slope shall be benched. The benches shall be in a ratio of 2 horizontal to 1 vertical. The face of the fill slopes shall be compacted as the fill is placed, or the slope may be overbuilt and then cut back to the design grade. Compaction by track walking will not be allowed.

3.13 FINISH GRADING

- A. At completion of project, site shall be finished graded, as indicated on Drawings. Finish grades shall be "flat graded" to grades shown on the drawing. Mounding of finish grades

**EARTHWORK
SECTION 31 0000
3595001**

will not be allowed unless otherwise directed on the landscape drawings. Tolerances for finish grades in drainage swales shall be $\pm 0.05'$. Tie in new and existing finish grades. Leave all landscaped areas in finish condition for lawn seeding. Landscaped planters shall be graded uniformly from edge of planter to inlets. If sod is used for turf areas the finish grade on which it is placed shall be lowered to allow for sod thickness.

- B. All landscape areas shall be left free of rock or foreign material.
- C. All landscape areas shall be approved by Architect prior to any planting.

3.14 SURPLUS MATERIAL

- A. Excavated material not required for grading or backfill shall be removed from site at contractor's expense.

3.15 CLEANING

- A. Refer to Section 01 7700.
- B. Remove from fill all vegetation, wood, form lumber, casual lumber, and shavings, in contact with ground; buried wood will not be permitted in any fill.

END OF SECTION

*s:\master specifications\division 31 - earthwork\31 0000_earthwork.docx
Received from WCEI: June 7, 2018, Updated format: 9-3-21*

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Trench backfill materials.

1.2 RELATED REQUIREMENTS

- A. Section 01 5000, Temporary Facilities and Controls.
- B. Section 01 8113, Sustainable Design Requirements, for CAL-Green **[and Collaborative for High Performance Schools (CHPS)]** general requirements and procedures.
- C. Section 31 0000, Earthwork.
- D. Section 32 8000, Irrigation.
- E. Section 33 0000, Utilities
- F. Section 33 4000, Storm Drainage Utilities.

1.3 REREENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CAL Green), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- C. California Plumbing Code (CPC), edition as noted on the drawings.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Submittal Procedures:
 - 1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
 - 2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
 - 3. Sustainable Design Submittals shall comply with the additional requirements of Section 01 8113, Sustainable Design Requirements.
- B. Coordination:
 - 1. General Contractor shall coordinate work as herein specified, in accordance with drawings and as required to complete scope of work with all related trades.

TRENCHING AND BACKFILLING
SECTION 31 2333
3595001

1.5 ACTION SUBMITTALS

- A. Provide supplier's descriptive literature for all products to demonstrate compliance with specified attributes:

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For contractor / Installer.

1.7 CLOSEOUT SUBMITTALS

- A. Guarantee: Submit subcontractor's guarantee.

1.8 QUALITY ASSURANCE

- A. Contractor / Installer shall have been in business for five (5) years providing/finishing similar size projects and complexity.
- B. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.
- C. All materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.

1.9 DELIVERY, STORAGE AND HANDLING

- A. Transport, store and handle in strict accord with the local jurisdiction.

1.10 FIELD CONDITIONS

- A. Contractor shall acquaint himself with all existing site conditions. If unknown active utilities are encountered during work, notify Architect promptly for instructions. Failure to notify will make Contractor liable for damage to these utilities arising from Contractor's operations subsequent to discovery of such unknown active utilities.
- B. Trench dewatering may be necessary. Contractor shall provide any and all tools, equipment and labor necessary for trench dewatering no matter what the source. Dewatering shall be continuous until all site utilities are installed and backfilled.

1.11 PROTECTION

- A. Adequate protection measures shall be provided to protect workers and passers-by on and off the site. Adjacent property shall be fully protected throughout the operations. Blasting will not be permitted. Prevent damage to adjoining improvements and properties both above and below grade. Restore such improvements to original condition should damage occur. Replace trees and shrubs outside building area disturbed by operations. Repair all trenches in grass areas with new sod (seeding not permitted) and "stake-off" for protection.

TRENCHING AND BACKFILLING
SECTION 31 2333
3595001

- B. Contractor shall be solely and completely responsible for working conditions at the job site, including safety of all persons and property during performance of the work. This requirement shall apply continuously and shall not be limited to normal working hours.
- C. Any construction review of the Contractor's performance conducted by the Architect or Owner is not intended to include review of the adequacy of the Contractor's safety measures, in, on or near the construction site.
- D. Provide shoring, sheeting, sheet piles and or bracing to prevent caving, erosion or gulying of sides of excavation.
- E. Surface Drainage: Provide for surface drainage during period of construction in manner to avoid creating nuisance to adjacent areas. Keep all excavations free from water during entire progress of work, regardless of cause, source or nature of water.
- F. Adjacent streets and sidewalks shall be kept free of mud, dirt or similar nuisances resulting from earthwork operations.
- G. The site and adjacent influenced areas shall be watered as required to suppress dust nuisance.
- H. Trees: Carefully protect existing trees which are to remain.

1.12 TRENCH SAFETY PROVISIONS

- A. General Contractor shall be solely responsible for safety design, construction and coordination with agencies having jurisdiction. If such plan varies from shoring system standards established by Construction Safety Orders, plan shall be prepared by registered civil or structural engineer.
- B. Nothing herein shall be deemed to allow use of shoring, sloping or protective system less effective than that required by Construction Safety Orders of California State Division of Industrial Safety.
- C. When trenching through paved surface, provide steel trench plates to cover open trenches daily until trenches are backfilled.

1.13 SEASONAL LIMITS

- A. No backfill material shall be placed, spread or rolled during unfavorable weather conditions. When work is interrupted by heavy rains, full operations shall not be resumed until field tests indicate that moisture content and density of fill are satisfactory.
- B. Material above optimum moisture shall be processed per Section 31 0000, Part 3, Article "Subgrade Preparation".

1.14 TESTING

- A. General: Refer to Section 31 0000, Part 1, Article "Testing" and Part 3, Article "Testing and Observation".

TRENCHING AND BACKFILLING
SECTION 31 2333
3595001

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Backfill materials: Pipeline and conduit trench backfill as shown on the plans and as specified below.
 - 1. ¾ inch crush rock.
 - 2. Native Materials: Soil native to Project Site, free of wood, organics, and other deleterious substances. Rocks shall not be greater than 3-inches.
 - 3. Sand: Fine granular material, free of organic matter, mica, loam or clay.
 - 4. Lean Mix Concrete: 3 sacks of cement per yard plus sand.
 - 5. Class 2 aggregate base, ¾" rock, per Caltrans Section 26-1.02B
 - 6. Controlled Density Fill: 3 sack slurry backfill.
- B. Water: Furnish all required water for construction purposes, including compaction and dust control. Water shall be potable.
- C. Provide other bedding and backfill materials as described and specified in Section 33 0000, Section 33 4000 and Divisions 22 and 26.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verification of Conditions:
 - 1. Examine areas and conditions under which work is to be performed.
 - 2. Identify conditions detrimental to proper or timely completion of work and coordinate with General Contractor to rectify.

3.2 INSTALLATION

- A. Perform work in accordance with pipe manufacturer's recommendations, as herein specified and in accordance with drawings.

3.3 TRENCHING

- A. Make all trenches open vertical construction with sufficient width to provide free working space at both sides of trench around installed item as required for caulking, joining, backfilling and compacting; not less than 12 inches wider than pipe or conduit diameter, unless otherwise noted.
- B. Carefully excavate around existing utilities to avoid unnecessary damage. The contractor shall anticipate and perform hand work near existing utilities as shown on the survey, without additional claims or cost.
- C. Trench straight and true to line and grade with bottom smooth and free of edges or rock points.

TRENCHING AND BACKFILLING
SECTION 31 2333
3595001

- D. Where depths are not shown on the plans, trench to sufficient depth to give minimum fill above top of installed item measured from finish grade above the utility as follows:
1. Sewer pipe: depth to vary
 2. Storm drain pipe: depth to vary
 3. Water pipe - Fire Supply: 36 inches
 4. Water pipe – Domestic Supply: 30 inches

3.4 BACKFILL

- A. Pipe Trench Backfill is divided into three zones:
1. Bedding: Layer of material directly under the pipe upon which the pipe is laid.
 2. Pipe Zone: Backfill from the top of the bedding to 6 inches (compacted) over the top of the pipe.
 3. Upper Zone: Backfill between top of Pipe Zone and to surface of subgrade.
- B. Bedding: Type of material and degree of compaction for bedding backfill shall be as defined in the Details and Specifications.
- C. Pipe Zone and Upper Zone Backfill:
1. Type of material and degree of compaction Pipe Zone and Upper Zone Backfill shall be as required by Drawings, Details, & Specifications.
 2. Upper Zone Backfill shall not be placed until conformance of Bedding and Pipe Zone Backfill with specified compaction test requirements has been confirmed.
 3. Backfill shall be brought up at substantially the same rate on both sides of the pipe and care shall be taken so that the pipe is not floated or displaced. Material shall not be dropped directly on pipe.
- D. Backfill Compaction:
1. Backfill shall be placed in layers which, when compacted shall not exceed 6 inches in thickness. Each layer shall be spread evenly and thoroughly mixed to insure uniformity. Do not backfill over, wet, frozen or soft subgrade surfaces. Employ a placement method that does not disturb or damage foundation walls, perimeter drainage, foundation damp-proofing, waterproofing or protective cover.
 2. When moisture content of fill material is below that required to achieve specified density, add water until proper moisture content is achieved. When moisture content is above that required, aerate by blading or other methods until specified moisture content is met; see Section 31 0000, Part 3, Article "Subgrade Preparation".
 3. After each layer has been placed, mixed and spread evenly, it shall be thoroughly compacted to 95% of maximum dry density while at specified moisture content. Compact each layer over its entire area until desired density has been obtained.
 4. Compaction: All backfill operations shall be observed by the Inspector of Record and/or Geotechnical Engineer. Field density tests shall be made to check compaction of fill material. If densities are not satisfactory, Contractor will be

TRENCHING AND BACKFILLING
SECTION 31 2333
3595001

required to change equipment or procedure or both, as required to obtain specified densities. Notify Inspector and Architect at least 24 hours in advance of any operation.

E. Backfill in Areas Previously Lime or Cement Treated

1. Where trenching occurs in areas that have been lime or cement treated, class 2 aggregate bases or approved controlled density backfill material shall be used for the top 12-inches minimum of the trench or thickness shall match the depth of treated material.

3.5 TRENCH AND SITE RESTORATION

- A. Finished surface of trenches shall be restored to a condition equal to, or better than the condition as existed prior to excavation work.

3.6 PROTECTION

- A. Protect existing surfaces, structures, and utilities from damage. Protect work by others from damage. In the event of damage, immediately repair or replace to satisfaction of Owner.
- B. Repair existing landscaped areas to as new condition. Replant trees, shrubs or groundcover with existing materials if not damaged or with new materials if required. Replace damaged lawn areas with sod, no seeding will be permitted.
- C. Replace damaged pavement with new compatible matching materials. Concrete walks to be removed to nearest expansion joint and entire panel replaced. Asphalt to be cut neatly and replaced with new materials.
- D. Any existing materials removed or damaged due to trenching to be returned to new condition.

3.7 SURPLUS MATERIAL

- A. Remove excess excavated material, unused materials, damaged or unsuitable materials from site.

3.8 CLEANING

- A. Refer to Section 01 7700.
- B. Contractor will keep the work areas in a clean and safe condition so his rubbish, waste, and debris do not interfere with the work of others throughout the project and at the completion of work.
- C. After completion of work in this section, remove all equipment, materials, and debris. Leave entire area in a neat, clean, acceptable condition.

TRENCHING AND BACKFILLING
SECTION 31 2333
3595001

END OF SECTION

s:\master specifications\division 31 - earthwork\31 2333_trenching and backfilling.docx
Received from WCEI: October 20, 2012; Updated 9-2-21

PART 1 – GENERAL

1.1 SUMMARY

- A. Provide all labor, materials, equipment, and tools necessary for the complete installation of an attenuated synthetic grass infill system as outlined in these specifications. The system should consist of but not necessarily be limited to the following:
- B. A vertical draining field base consisting of a four-inch layer of compacted $\frac{3}{4}$ " Class 2 aggregate compacted to 95% and four-inch layer of Class 2 permeable base compacted to 90-95% relative compaction.
- C. A complete synthetic grass system, consisting of:
 - 1. Synthetic turf
 - 2. Cushion layer
 - 3. An infill system, consisting of a specially formulated non-expansive, coated, clean, dust free and specially sized silicon dioxide bead (Envirofill brand preferred).
- D. Quality Assurance: Manufacturer should have manufactured and installed synthetic grass surfaces for a minimum of 5 years. Manufacturer's detailed installation procedures should be submitted to the Architect and made part of the Bid Specifications.

1.2 RELATED REQUIREMENTS

- A. Section 01 5000, Temporary Facilities and Controls.
- B. Section 31 0000, Earthwork.
- C. Section 33 4000, Storm Drainage Utilities.

1.3 REREENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. ASTM D624 Standard Test Method for Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomers.
- C. ASTM D2859 Standard Test Method for Flammability of Finished Textile Floor Covering Materials
- D. ASTM E303 Standard Test Method for Measuring Surface Frictional Properties Using the British Pendulum Tester
- E. ASTM F1292 Standard Specification for Impact Attenuation of Surface Systems Under

and Around Playground Equipment

- F. ASTM F1951 Standard Specification for Determination of Accessibility of Surface Systems Under and Around Playground Equipment
- G. ASTM C1028 Standard Test Method for Determining the Static Coefficient of Friction of Ceramic Tile and Other Like Surfaces by the Horizontal Dynamometer Pull Meter Method – This standard replaces ASTM D2047
- H. ASTM D412 Standard Test Methods for Vulcanized Rubber and Thermoplastic Rubbers and Thermoplastic Elastomers- Tension

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Submittal Procedures:
 - 1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
 - 2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
 - 3. Sustainable Design Submittals shall comply with the additional requirements of Section 01 8113, Sustainable Design Requirements.
- B. Coordination:
 - 1. General Contractor shall coordinate work as herein specified, in accordance with drawings and as required to complete scope of work with all related trades.

1.5 ACTION SUBMITTALS

- A. Provide supplier's descriptive literature for all products to demonstrate compliance with specified attributes:

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For contractor / Installer.
Prospective manufacturers and/or installers of the turf should be required to comply with the following:
 - I. The turf manufacturer must be experienced in the manufacture of a no nail synthetic grass system and provide references of five (5) specific installations in the last three (3) years.
 - J. The turf installer must provide competent workmen skilled in no nail synthetic grass installation. The designated supervisory personnel on the project must be competent in the installation of this material, including gluing seams and proper installation of the infill mixture.
- K. Installation should be in accordance with ASTM F1292 for Impact Attenuation of surface system under and around playground equipment. The poured in place system to be installed in compliance with the Critical Fall Height as determined by the Playground

Equipment (if any).

- L. Manufacturers should provide written instructions for recommended maintenance practices.

1.7 CLOSEOUT SUBMITTALS

- A. Guarantee: Submit subcontractor's guarantee.

1.8 QUALITY ASSURANCE

- A. Contractor / Installer shall have been in business for five (5) years providing/finishing similar size projects and complexity.
- B. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.
- C. All materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.

1.9 DELIVERY, STORAGE AND HANDLING

- A. Transport, store and handle in strict accord with the local jurisdiction.

1.10 FIELD CONDITIONS

- A. Contractor shall acquaint himself with all existing site conditions. If unknown active utilities are encountered during work, notify Architect promptly for instructions. Failure to notify will make Contractor liable for damage to these utilities arising from Contractor's operations subsequent to discovery of such unknown active utilities.
- B. Trench dewatering may be necessary. Contractor shall provide any and all tools, equipment and labor necessary for trench dewatering no matter what the source. Dewatering shall be continuous until all site utilities are installed and backfilled.

1.11 PROTECTION

- A. Adequate protection measures shall be provided to protect workers and passers-by on and off the site. Adjacent property shall be fully protected throughout the operations. Blasting will not be permitted. Prevent damage to adjoining improvements and properties both above and below grade. Restore such improvements to original condition should damage occur. Replace trees and shrubs outside building area disturbed by operations. Repair all trenches in grass areas with new sod (seeding not permitted) and "stake-off" for protection.
- B. Contractor shall be solely and completely responsible for working conditions at the job site, including safety of all persons and property during performance of the work. This requirement shall apply continuously and shall not be limited to normal working hours.
- C. Any construction review of the Contractor's performance conducted by the Architect or Owner is not intended to include review of the adequacy of the Contractor's safety measures, in, on or near the construction site.

SYNTHETIC TURF
SECTION 32 1816.16
3595001

- D. Provide shoring, sheeting, sheet piles and or bracing to prevent caving, erosion or gullyng of sides of excavation.
- E. Surface Drainage: Provide for surface drainage during period of construction in manner to avoid creating nuisance to adjacent areas. Keep all excavations free from water during entire progress of work, regardless of cause, source or nature of water.
- F. Adjacent streets and sidewalks shall be kept free of mud, dirt or similar nuisances resulting from earthwork operations.
- G. The site and adjacent influenced areas shall be watered as required to suppress dust nuisance.
- H. Trees: Carefully protect existing trees which are to remain.

1.12 TRENCH SAFETY PROVISIONS

- A. General Contractor shall be solely responsible for safety design, construction and coordination with agencies having jurisdiction. If such plan varies from shoring system standards established by Construction Safety Orders, plan shall be prepared by registered civil or structural engineer.
- B. Nothing herein shall be deemed to allow use of shoring, sloping or protective system less effective than that required by Construction Safety Orders of California State Division of Industrial Safety.
- C. When trenching through paved surface, provide steel trench plates to cover open trenches daily until trenches are backfilled.

1.13 SEASONAL LIMITS

- A. No backfill material shall be placed, spread or rolled during unfavorable weather conditions. When work is interrupted by heavy rains, full operations shall not be resumed until field tests indicate that moisture content and density of fill are satisfactory.
- B. Material above optimum moisture shall be processed per Section 31 0000, Part 3, Article "Subgrade Preparation".

1.14 TESTING

- A. General: Refer to Section 31 0000, Part 1, Article "Testing" and Part 3, Article "Testing and Observation".

1.15 WARRANTY AND MAINTENANCE

- A. The bidder and/or the turf manufacturer must provide the following:
- B. The turf manufacturer should provide a warranty to the owner that covers defects in materials and workmanship of the turf for a period of **FIVE (5) years** from the date of Substantial Completion, and **TWO (2) years** on seams.
- C. The manufacturer's warranty should specifically exclude vandalism, acts of War and acts of Nature beyond the control of the owner of the manufacturer.

- D. All turf warranties should be limited to repair or replacement of the affected areas and should include all necessary materials, labor, transportation costs, etc. to complete said repairs.
- E. All warranties are contingent upon full payment by the owner of all pertinent invoices and owner, at owner's expense, completing a full power-brooming and "top-off" of lost infill at two-year intervals from date of substantial completion.
- F. The bidder should provide a maintenance program to the owner. The warranty should be subject to compliance with said maintenance program in addition to items named above.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

The synthetic turf material and resilient cushion should be in accordance with the following:

- A. Acceptable Manufacturer: Beyond Grass Premium or Tencate Grass.
- B. Or approved equal.

2.2 SYSTEM REQUIREMENTS

- A. A poured in place system with a synthetic grass wearing layer upper membrane and an underlying impact attenuation cushion layer. The finished surface should be porous and capable of being installed at varying thickness to comply with Critical Fall Height requirements of playground equipment.
- B. The cushion layer should be a mixture of black recycled rubber mixed with a 100% solids moisture cured aromatic Polyurethane binder (100 pounds of rubberized cushion layer to 12 pounds of binder) installed at the appropriate thickness.
- C. Synthetic Turf shall be:
 - 1. A 1-1/2" monofilament polyethylene with brown thatch yarn, formulated for superior wear resistance and a secondary proprietary polyethylene thatch. Product must have built-in antimicrobial protection to inhibit the growth of bacteria, mold, mildew, and reduce odor.
 - 2. The system should be tufted with a minimum of 60 ounce of yarn per square yard. The system should also include a primary woven polypropylene backing and a polyurethane secondary backing. Finish coating shall be at 22 ounces per square yard.
 - 3. The machine gauge shall be 1/2". Tufted pile height is 1-1/2".
 - 4. Total fabric weight shall be at least 88 ounces per square yard.
 - 5. The finished product should also include perforations to ensure drainage greater than 30 inches per hour. Non-perforated systems should not be acceptable alternates for purposes of this specification.

- D. The turf should be delivered in 15' wide rolls.
- E. All lines, numbers and markings indicated on plans should be permanently inlaid. Painted lines should not be an acceptable alternative for purposes of this specification.
- F. The fiber should be green in color to simulate natural grass as closely as possible and treated with UV inhibitor, guaranteed a minimum of eight years.
- G. The infill system should be an a non-expansive engineered coated, clean, dust free and specially sized silicon dioxide beads.
- H. Latex backed turf shall not be acceptable. All adhesives must also be latex free.

PART 3 – EXECUTION

3.1 SITE PREPARATION AND BASE

- A. The sub-base will have a slope per plan.
- B. The base aggregate should consist of a minimum of four inches (4") of $\frac{3}{4}$ " Class 2 aggregate compacted to 95% and four inches (4") of $\frac{3}{4}$ " Class 2 permeable aggregate base compacted to between 90%-95%.
- C. The sub base should be installed in two inch (2") lifts to appropriate thickness.
- D. The sub-base should be compacted using vibrating tamper, to approximately 95% Proctor density.
- E. The sub-base should no longer have any vegetation.
- F. Subgrade prior to aggregate installation: Sublevel grade is to be compacted prior to the ABC aggregate installation. Particular attention should be paid to areas of disturbed earth such as where footers for playground equipment enter the ground. Concrete used to fill said areas/footers should be poured to the top of sublevel surface.
- G. The sub-base installer and architect will accept the aggregate base in writing prior to the installation of the poured in place system.
- H. Any alterations must be agreed between all parties.

3.2 INSTALLATION

The synthetic turf safety surfacing installer should strictly adhere to the installation procedures outlined under these sections. Any variance from these requirements should be accepted in writing by the manufacturer's onsite representative and submitted to the architect/owner, verifying that the changes do not in any way affect the warranty.

A. Cushion Layer

1. The components of the poured in place safety surfacing should be mixed on site in a mixer to ensure a comprehensive mix according to manufacturer's instructions.
2. The cushion layer comprised of SBR buffings shall be mixed with the aromatic moisture cured polyurethane binder at a rate of 12% of the total weight of the material thoroughly so that the binder is evenly dispersed into the rubber base.
3. The cushion layer comprised of non-tire derived SBR & EPDM Chunk Rubber shall be mixed with the appropriate amount of urethane so that the binder is evenly dispersed into the rubber base.
4. The cushion layer mix should then be spread and troweled to the desired depth and allow to cure for 24 hours.

B. Synthetic Turf Layer

1. The synthetic grass should be cut and laid out across the area, and utilizing standard state-of-the-art gluing procedures, each roll should be seamed to the next.
2. The edge of the synthetic turf should be stapled or nailed to header/anchor board.
3. A strip of seam tape should be used to seam the rolls of material. The specified glue should be a one part urethane adhesive (SeamTight).

C. Infill

1. The infill material shall be spread evenly, at a rate of 2 lbs per square foot with a large fertilizer type spreader. The infill will be spread in strict accordance with the turf installer's specifications.
2. Between each application of infill, the field area should be brushed with a motorized rotary nylon broom.
3. Caution: Too much fiber exposed (not enough infill) will cause the fibers to mat or crush with heavy foot traffic. This will lead to premature wearing of the fiber and will void any manufacturer's warranty. No Crumb Rubber shall be used as infill.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Aggregate.
 - 2. Asphalt paving.
 - 3. Seal coat.
 - 4. Wood headers and stakes.
 - 5. Pavement marking.
 - 6. Precast concrete bumpers.

1.2 RELATED REQUIREMENTS

- A. Section 01 5000, Temporary Facilities and Controls.
- B. Section 01 6116, Volatile Organic Compound (VOC) Restrictions, for VOC limits pertaining to adhesives, sealants, fillers, primers, and coatings.
- C. Section 01 8113, Sustainable Design Requirements, for CAL-Green **[and Collaborative for High Performance Schools (CHPS)]** general requirements and procedures.
- D. Section 31 0000, Earthwork.
- E. Section 31 2333, Trenching and Backfilling.
- F. Section 32 8000, Irrigation.
- G. Section 33 0000, Utilities.
- H. Section 33 4000, Storm Drainage Utilities.

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CAL Green), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- C. Local Jurisdiction: Any work within the street, highway or right-of-way shall be performed in accordance with the requirement of the governmental agencies having jurisdiction, and shall not begin until all of those governing authorities have been notified.
- D. ASTM International (ASTM):

**ASPHALT CONCRETE PAVING
SECTION 32 1200
3595001**

1. D698-00 Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures, Using 5.5 lb (2.49 Kg) Rammer and 12 inch (304.8 mm) Drop.
2. D1556-00 Test Method for Density of Soil in Place by the Sand-Cone Method.
3. D1557-02 Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 10 lb. (4.54 Kg) Rammer and 18 inch (457 mm) Drop.
4. D6628-16 Standard Specification for Color of Pavement Marking Materials.
5. D3017-05 Test Methods for Moisture Content of Soils and Soil-Aggregate Mixture by Nuclear Methods (Shallow Depth).
6. D4318-05 Test Method for Liquid Limit, Plastic Limit, and Plasticity Limit.

E. CALTRANS Standard Specifications.

F. CAL-OSHA, Title 8, Section 1590 (e).

1.4 ADMINISTRATION REQUIREMENTS

A. Submittal Procedures:

1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
3. Sustainable Design Submittals shall comply with the additional requirements of Section 01 8113, Sustainable Design Requirements.

1.5 ACTION SUBMITTAS

A. Provide supplier's descriptive literature for all products to demonstrate compliance with specified attributes.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Contractor / Installer.

B. Sustainable Design:

1. General
 - a. Submit information necessary to establish and document compliance with the California Green Building Standards Code.
 - b. Sustainable design submittals are in addition to other submittals.
2. The following information shall be provided:
 - a. Adhesives and Sealants: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.
 - b. Paints and Coatings: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.

1.7 CLOSEOUT SUBMITTALS

- A. Guarantee: Submit subcontractor's guarantee.

1.8 QUALITY ASSURANCE

- A. Contractor / Installer shall have been in business for five (5) years providing/finishing similar size projects and complexity.
- B. Contractor shall be solely responsible for all subgrades built. Any repairs resulting from inadequate compaction is the responsibility of the contractor.
- C. The representatives of the Owner's testing lab will not act as supervisor of construction, nor will they direct construction operations. Neither the presence of the Owner's testing lab representatives nor the testing by the Owner's testing lab shall excuse the contractors or subcontractors for defects discovered in their work during or following completion of the project. Correcting inadequate compaction is the sole responsibility of the contractor.
- D. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.
- E. All materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.
- F. Contractor shall provide verification that asphalt mix temperature meets the requirements of this specification at time of application.
- G. Tests (See Part 1, Article "Testing").

1.9 DELIVERY, STORAGE AND HANDLING

- A. Transport, store and handle in strict accord with the local jurisdiction.

1.10 FIELD CONDITIONS

- A. Environmental Requirements:
 - 1. Base Course: Do not lay base course on muddy subgrade, during wet weather, or when atmospheric temperature is below 40 degrees F.
 - 2. Asphalt Surfacing: Do not apply asphaltic surfacing on wet base, during wet weather, or when atmospheric temperature is below 50 degrees F.

1.11 EXISTING SITE CONDITIONS

- A. Contractor shall acquaint himself with all site conditions. If unknown active utilities are encountered during work, notify Architect promptly for instructions. Failure to notify will make Contractor liable for damage to these utilities arising from Contractor's operations subsequent to discovery of such unknown active utilities.

1.12 PROTECTION

- A. Adequate protection measures shall be provided to protect workmen and passers-by on and off the site. Adjacent property shall be fully protected throughout the operations. Blasting will not be permitted. Prevent damage to adjoining improvements and properties both above and below grade. Restore such improvements to original condition should damage occur. Replace trees and shrubs outside building area disturbed by operations.
- B. In accordance with generally accepted construction practices, the Contractor shall be solely and completely responsible for working conditions at the job site, including safety of all persons and property during performance of the work. This requirement shall apply continuously and shall not be limited to normal working hours.
- C. Any construction review of the Contractor's performance conducted by the owner's representative is not intended to include review of the adequacy of the Contractor's safety measures, in, on, or near the construction site.
- D. Surface Drainage: Provide for surface drainage during period of construction in manner to avoid creating nuisance to adjacent areas. The contractor shall make a reasonable effort on a daily basis to keep all excavations and the site free from water during entire progress of work, regardless of cause, source, or nature of water.
- E. Adjacent streets and sidewalks shall be kept free of mud, dirt or similar nuisances resulting from earthwork operations.
- F. The site and adjacent influenced areas shall be watered as required to suppress dust nuisance. Dust control measures shall be in accordance with the local jurisdiction.

1.13 SEASONAL LIMITS

- A. No fill material shall be placed, spread or rolled during unfavorable weather conditions. When work is interrupted by rains, fill operations shall not be resumed until field tests indicate that moisture content and density of fill are satisfactory.

1.14 TESTING

- A. General: Refer to Section 01 4523 – TESTING & INSPECTION SERVICES AND STRUCTURAL TESTS AND INSPECTIONS LIST, DSA-103.
- B. Geotechnical Engineer: Owner is retaining a Geotechnical Engineer to determine compliance of fill with Specifications, and to direct adjustments in fill operations. Costs of Geotechnical Engineer will be borne by Owner; except those costs incurred for re-tests or re-inspection will be paid by Owner and backcharged to Contractor.

PART 2 - PRODUCTS

2.1 DESIGN AND PERFORMANCE CRITERIA

- A. Sustainable Design:

**ASPHALT CONCRETE PAVING
SECTION 32 1200
3595001**

1. VOC emissions for field-applied adhesives, sealants, and sealant primers must comply with limits specified in Section 01 6116.
2. VOC emissions for field-applied paints and coatings must comply with limits specified in Section 01 6116.

2.2 MATERIALS

- A. Sterilant: Soil sterilizer shall be CIBA GEIGY's Pramitol 25-E, Treflan EC or Thompson-Hayward Casoron.
 1. Soil sterilizer shall be applied in strict accordance with manufacturer's instructions.
- B. Base Course Aggregate: State Specifications, Section 26, Class 2 aggregate base (3/4" max.).
- C. Asphalt Binder: Steam-refined paving asphalt conforming to State Specifications, Section 92, viscosity grade PG 64-10. Asphalt binder additives for HMA per Caltrans approved list of manufacturers.
- D. Liquid Asphalt Tack Coat: Per CALTRANS section 94.
- E. Surface Course Aggregate: Mineral aggregates for Type "B" asphalt concrete, conforming to State Specifications 39-2.02, Type B, 1/2" maximum, medium gradient. 3/8" maximum gradient at Playcourt.
- F. Seal Coat: shall be a pre-mixed asphalt emulsion blended with select fillers and fibers such as:
 1. "Park-Top No. 302", Western Colloid Products.
 2. "Overcoat", Reed and Gram.
 3. "Drivewalk", Conoco Oil.
- G. Wood Headers and Stakes: Pressure treated.
- H. Pavement Marking: Colors as directed by Architect. Colors of painted traffic stripes and pavement markings must comply with ASTM D6628.
 1. Waterborne traffic line - colors white, yellow and red, State specification PTWB-01R3.
 2. Waterborne traffic line for the international symbol of accessibility and other curb markings – blue, red and green, Federal specification TT-P-1952F.
- I. Precast Concrete Bumpers: 3000 psi at 28 day minimum strength; 48" length unless otherwise indicated; provide with steel dowel anchors and concrete epoxy.
- J. Pavement Epoxy; K-Lite; KtepX-590; Ennis Epoxy HPS2 or an approved equal.
- K. Crack Filler; QPR model CAR08, 10oz asphalt crack filler; Star STA-FLEX Trowel Grade crack filler or approved equal.

ASPHALT CONCRETE PAVING
SECTION 32 1200
3595001

- L. Reclaimed Asphalt Paugment (RAP). HMA Type A or Type B may be produced using RAP providing it does not exceed 15% or the aggregate blend.

2.3 MIXES

- A. General: Plant mixed conforming to State Specifications, Section 39, Type B, 1/2" maximum, medium grading. 3/8" maximum grading shall be used at hardcourt.
- B. Temperature of Hot Mix Asphalt: Not less than 275 degrees F nor more than 325 degrees F when added to aggregate.
- C. Temperature of Hot Mix Aggregate: Not less than 250 degrees F nor more than 325 degrees F when asphalt is added.
- D. Temperature of Hot Mix Asphalt Concrete: Asphalt shall be not less than 285 degrees at time of application, nor more than 350 degrees. Asphalt not meeting the required temperature shall not be used.
- E. Temperature of Warm Mix Asphalt: Mixing and placement; per the approved manufactures heat range recommendations for mixing and placement.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Conditions of Work in Place: Subsurfaces which are to receive materials specified under this Section shall be carefully examined before beginning work hereunder, and any defects therein shall be reported, in writing, to the Architect. Work shall not be started until such defects have been corrected. Starting of work shall imply acceptance of conditions as they exist.

3.2 PREPARATION

- A. Sub-Grade: Clean, shape and compact to hard surface free from elevations or depressions exceeding 0.05' in 10' from true plan. Compact per Section 31 0000. Compaction and moisture content shall be verified immediately prior to placement of aggregate base. Proof roll subbase in presence of geotechnical engineer prior to placement of aggregate base.

3.3 INSTALLATION

- A. Headers:
 - 1. General: Install as edging to asphalt paving, except where adjoining existing pavement, concrete curbs, walks or building.
 - 2. Existing Headers: Remove existing headers where new paving will join existing. Saw cut existing asphalt to provide clean edge.
 - 3. Lines and Levels: Install true to line and grade. Cut off tops of stakes 2-inches below top of header so they will not be visible on completion of job.

**ASPHALT CONCRETE PAVING
SECTION 32 1200
3595001**

B. Asphalt Paving:

1. Base Course: Install in accord with State Specifications, Section 26. Compact to relative compaction of not less than 95%, ASTM D1557. The material shall be deposited on the subgrade in such a manner as to provide a uniform section of material within five percent tolerance of the predetermined required depth. Deposition will be by spreader box or bottom dump truck to prevent segregation of the material. The material so deposited on the subgrade shall have sufficient moisture which, in the opinion of the Architect is adequate to prevent excessive segregation. It shall then be immediately spread to its planned grade and cross section. Undue segregation of material, excessive drifting or spotting of material will not be permitted. If in the opinion of the site geotechnical engineer, the material is unsuitably segregated, it shall be removed or completely reworked to provide the desired uniformity of the material.
 - a. Moisture content and compaction of base material shall be tested immediately prior to placement of asphalt paving.
2. Sterilant: Apply specified material at manufacturer's recommended rate. Applicator of sterilant material shall be responsible for determining location of all planter areas. Apply specified material over entire base course area just prior to application of asphalt. Follow manufacturer's printed directions.
3. Liquid Asphalt Tack Coat: Apply as "tack coat" to all vertical surfaces of existing paving, curbs, walks, and construction joints in surfacing against which paving is to be placed.
4. Asphalt Concrete Surface Course:
 - a. Comply with State Specifications, 39-6 except as modified below.
 - 1) Final gradation shall be smooth, uniform and free of ruts, humps, depressions or irregularities, with a minimum density of 91% of the theoretical maximum specific gravity determined by California Test Method #309. Maximum variation 1/8 inch in 10' when measured with steel straightedge in any one direction. Test paved areas for proper drainage by applying water to cover area. Correct portions that do not drain properly by patching with plant mix. In no case shall accessible parking spaces or loading and unloading areas exceed 2% slope in any direction.
 - 2) Asphalt material shall be delivered to the project site in a covered condition to maintain acceptable temperature.
5. Placement and adjustment of Frames, Covers, Boxes and Grates: The Contractor shall set and adjust to finish grade all proposed and existing frames, covers, boxes, and grates of all manholes, drop inlets, drain boxes, valves, cleanouts, electrical boxes and other appurtenant structures prior to placement of asphaltic concrete.
6. Water Testing: All paved areas shall be water tested, to check drainage, in the presence of the project inspector prior to placement of seal coat. The surface of asphalt paving shall not vary more than 1/8 inch above or below the grade established on the plans. If variations in grade are present, they will be corrected by overlaying paving and/or pavement removal and replacement as directed by the Architect.

**ASPHALT CONCRETE PAVING
SECTION 32 1200
3595001**

7. Patching: Cut existing paving square and plumb at all edges to be joined by new paving. In trenches; grind existing asphalt on each side of trench 3" wide x 1/2 the depth of the section. Apply tack coat to vertical surfaces before installing new work. Warp carefully to flush surface, with seal over joints, and feather edge. Sawcut, remove and patch existing paving where cutting is necessary for installation of piping or conduits under Divisions 15, 16 and 33.
8. Seal Coat:
 - a. Seal coat shall be applied no sooner than 30 days from time of asphalt placement.
 - b. Surface Preparation: surface shall be clean of all dirt, sand, oil or grease. Hose down entire area with a strong jet of water to remove all debris. Remove soft, loose, or otherwise damaged areas of asphalt concrete to full depth of damage and replace with compacted asphalt concrete as specified herein. Minor holes and imperfections may be patched using hot mix asphalt or mastic using sand/SS-1-H. Use wire brush for removal of oil and grease; prime with shellac or synthetic resin as recommended by manufacturer of pavement sealer material.
 - c. Seal Coat Seal Application: Thoroughly mix materials in the presence of the onsite inspector. Failure to do so will be cause for rejection. Apply in accordance with manufacturer's written instructions.
 - a. The minimum application rate for each applied coat shall be 30gals per 1000 sq. ft. Two coats of sealcoat will be required.
 - b. Clean-Up and Precautions: As recommended by pavement sealer material manufacturer.
 - d. Clean-Up and Precautions: As recommended by pavement sealer material manufacturer.
- C. Pavement Marking: painted pavement markings shall be done only after the seal coat has thoroughly dried. On clean surfaces to be painted with traffic paint of dust, dirt, grime, oil, rust or other contaminants which will impair the quality of work or interfere with proper bond of paint coats. Surfaces shall be cleaned to the extent and by whatever means that will satisfactorily accomplish the purpose without damage to asphalt concrete. Provide measured layouts, temporary markings, templates, and other means necessary to provide required marking. Prepare and apply paint in accordance with manufacturer's instructions; paint shall be applied by spray and shall achieve complete coverage free from voids and thin spots. Where indicated on the Drawings, paint parking stall strips, lettering, arrows, accessible symbols, playground markings, game striping, maps, etc. on concrete paving or asphalt concrete paving. Paint stripes shall be 4 inches wide (except otherwise indicated) and applied with two (2) coats of herein specified Traffic Line Paint; white (except as otherwise specified or indicated).
 1. International Accessible Symbol: Symbol shall be white figures on a blue background. Blue shall be equal to color No. 15090 in Fed. Std. 595c. Lines and symbols shall be accurately formed and true to line and form; lines shall be straight and uniform in width. Painted edges shall be clean cut and free from raggedness, and corners shall be cut sharp and square. Tolerances: Apply striping within a tolerance 1/2 inch in 50 feet. Apply markings and striping to widths indicated with a tolerance of 1/4 inch on straight sections and 1/2 inch on curved sections.

ASPHALT CONCRETE PAVING
SECTION 32 1200
3595001

- D. Colors: As directed by Architect
- E. Precast Concrete Bumpers: Install where shown, using steel dowels, and epoxy applied for length to wheel stop without damage to bumpers or asphalt concrete paving.

3.4 CLEANING

- A. Upon completion of work of this Section promptly remove from the working area all scraps, debris and surplus material of this Section.
- B. Clean excess material from surface of all concrete walks and utility structures.

END OF SECTION

*s:\master specifications\division 32 - site improvements\32 1200_asphalt concrete paving.docx
Received from WCEI: December 18, 2020, Format Updated 9-8-21*

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Concrete curbs and gutters.
2. Concrete pavement, sidewalks and ramps.
3. Steel reinforcing for flatwork and curbs.
4. Truncated domes.

1.2 RELATED REQUIREMENTS

- A. Section 01 6116, Volatile Organic Compound (VOC) Restrictions; for VOC limits pertaining to adhesives, sealants, fillers, primers, and coatings.
- B. Section 01 8113, Sustainable Design Requirements, for CAL-Green **[and Collaborative for High Performance Schools (CHPS)]** general requirements and procedures.
- C. Division 31, Earthwork.
- D. Section 32 1200, Asphalt Concrete Paving.

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CALGreen), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- C. American Concrete Institute (ACI):
1. 117: Specification for Tolerances for Concrete Construction and Materials and Commentary.
 2. 211.1: Standard Practice for Selecting Proportions for Normal, Heavyweight and Mass Concrete.
 3. 301: Specifications for Structural Concrete.
 4. 302.1R: Guide to Concrete Floor and Slab Construction.
 5. 305R: Guide to Hot Weather Concreting.
 6. 306R: Guide to Cold Weather Concreting.
 7. 308R: Guide to External Curing of Concrete.
 8. 318: Building Code Requirements for Structural Concrete and Commentary.
 9. 347R: Guide to Formwork for Concrete.
- D. ASTM International (ASTM):

1. A615/A615M: Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement.
 2. A706/A706M: Standard Specification for Deformed and Plain Low-Alloy Steel Bars for Concrete Reinforcement.
 3. C33/C33M: Standard Specification for Concrete Aggregates.
 4. C94/C94M: Standard Specification for Ready-Mixed Concrete.
 5. C143/C143M: Standard Test Method for Slump of Hydraulic-Cement Concrete.
 6. C150/C150M: Standard Specification for Portland Cement.
 7. C260/C260M: Standard Specification for Air-Entraining Admixtures for Concrete.
 8. C309: Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete.
 9. C330/C330M: Standard Specification for Lightweight Aggregates for Structural Concrete.
 10. C494/C494M: Standard Specification for Chemical Admixtures for Concrete.
 11. C618: Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete.
 12. C920: Standard Specification for Elastomeric Joint Sealants.
 13. C1107/C1107M: Standard Specification for Packaged Dry, Hydraulic Cement Grout (Non-Shrink).
 14. C1315: Standard Specification for Liquid Membrane-Forming Compounds Having Special Properties for Curing and Sealing Concrete.
 15. D1751: Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types).
 16. D5893/D5893M: Standard Specification for Cold Applied, Single Component, Chemically Curing Silicone Joint Sealant for Portland Cement Concrete Pavements.
- E. Concrete Reinforcing Steel Institute (CRSI):
1. Manual of Standard Practice.
 2. Placing Reinforcing Bars.
- F. State of California, Department of Transportation (Caltrans):
1. Division of Engineering Services:
 - a. California Test 342: Method of Test for Surface Skid Resistance with the California Portable Skid Test.
 2. Standard Specifications.
 - a. Section 51, Concrete Structures.
 - b. Section 52, Reinforcement.
 - c. Section 73, Concrete Curbs and Sidewalks.
 - d. Section 90, Concrete.
- G. US Government General Services Administration (GSA/SAE):

1. GSA/SAE AMS-STD-595A: Colors Used In Government Procurement.

1.4 ADMINISTRATIVE REQUIREMENTS

A. Submittal Procedures:

1. Action Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
3. Sustainable Design Submittals shall comply with the additional requirements of Section 01 8113, Sustainable Design Requirements.

1.5 ACTION SUBMITTALS

A. Shop Drawings: Joint pattern layout for walks and pavement.

B. Product Data:

1. A complete list of materials proposed to be used for the site concrete work including, but not limited to, sand, gravel, admixtures, surface treatments, coloring agents, sealers, cast-in-place accessories, forming and curing products, concrete mix designs, reinforcing materials, joint materials, curing materials, and detectable warning surface.
2. Manufacturer's descriptive literature for products proposed for use. Include installation instructions, and maintenance instructions.

C. Concrete Mix Design: The Contractor shall submit three copies of each proposed mix design for each class of concrete in accordance with ACI 301, Sections 3.9 "Proportioning on the Basis of Previous Field Experience or Trial Mixture," or 3.10 "Proportioning Based on Empirical Data." The Contractor shall submit a separate mix design for concrete to be placed by pumping, in addition to the mix design for concrete to be placed directly from the truck chute.

1. The following information shall be included in the concrete mix design:
 - a. Proportions of cement, fine and coarse aggregate, and water.
 - b. Water-cement ratio, 28-day compressive design strength, slump, and air content.
 - c. Type of cement and aggregate.
 - d. Special requirements for pumping.
 - e. Range of ambient temperature and humidity for which design is valid.
 - f. Special characteristics of mix, which require precautions in mixing, placing, or finishing techniques to achieve specified finished product.
2. Do not begin concrete production until mixes have been reviewed and approved by Engineer.
 - a. Review of mix design by the Architect and Engineer shall in no way relieve the subcontractor of his responsibility for the performance of the concrete.

D. Qualification Data: For manufacturer

- E. Delivery tickets as specified for ready-mixed concrete.
- F. Sustainable Design:
 - 1. General:
 - a. Submit information necessary to establish and document compliance with the California Green Building Standards Code.
 - b. Sustainable design submittals are in addition to other submittals.
 - 2. The following information shall be provided:
 - a. Adhesives and Sealants: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.
 - b. Paints and Coatings: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.

1.6 CLOSEOUT SUBMITTALS

- A. Guarantee: Submit subcontractor's guarantee.

1.7 QUALITY ASSURANCE

- A. Qualifications:
 - 1. Manufacturer of ready-mixed concrete products shall meet ASTM C94/C94M requirements for production facilities and equipment.
- B. Design, erect, support, brace and maintain formwork and shoring to safely support all loads that might be applied until such loads can be carried by concrete.
- C. The Contractor shall perform work in accordance with ACI 301.
- D. Use only new materials and products.
- E. Single-Source Responsibility: Use materials and products of one manufacturer whenever possible.
- F. Materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.
- G. Testing to determine compliance with the work of this Section will be the responsibility of the Contractor.
 - 1. Cement and reinforcing shall be tested in accordance with CBC Section 1910A. Testing of reinforcing may be waived in accordance with Section 1910A.2 when approved by the Engineer and DSA.
 - 2. Testing will be performed by an independent testing and inspecting agency in accordance with Section 01 4523, Testing and Inspection Services, and paid for by the Owner.
 - 3. Refer to Article FIELD QUALITY CONTROL in Part 3 of this Section for additional requirements.

4. Cost of retests and coring due to low strength or defective concrete will be paid by the Owner and back-charged to the Contractor.
- H. Sieve analysis from testing laboratories identifying rock/sand percentages within the concrete mix; or class 2 aggregate base shall have the current Project name and Project location identified on the report. Outdated analytical reports greater than 90 days old will not be accepted.
- I. Mockups: Provide on-site mockup panels for each type of exposed colored concrete flatwork showing texture and color before proceeding with finish to be used on this Project.
 1. Construct sample panels after review and approval of samples.
 2. Size: Minimum 5 feet square and have at least one longitudinal and one transverse joint unless a more specific note indicates otherwise on Drawings.
 3. Construct sample panels at location approved by Architect.
 4. Construct sample panels in ample time to allow for finishing and curing before requesting Architect to review.
 5. Follow procedures used on accepted samples.
 6. Include saw-cut and tooled joints to match method and appearance proposed for use in completed work.
 7. Prepare successive sample panels as required until finish, color, and appearance is approved by Architect.
 8. Do not remove sample panels until authorized in writing by the Architect and all concrete work has been approved.

1.8 DELIVERY, STORAGE AND HANDLING

- A. Deliver undamaged products to job in manufacturer's sealed containers and/or original bundles with tags and labels intact.
- B. Store materials in protected, dry conditions off of ground and in areas so as to not interfere with the progress of the Work.
- C. Transport, store and handle in strict accordance with the manufacturer's written recommendations.
- D. Store cement in weather tight building, permitting easy inspection and identification. Protect from dampness. Lumpy or stale cement will be rejected.
- E. Aggregates: Prevent excessive segregation, or contamination with other materials or other sizes of aggregate. Use only one supply source for each aggregate stock pile.

1.9 FIELD CONDITIONS

- A. Make and be responsible for all field dimensions necessary for proper fitting, slopes, and completion of work. Report discrepancies to Architect before proceeding.
- B. Do not place concrete during rain without adequate protection.

- C. The Contractor shall conform to ACI 306R when mixing and placing concrete during cold weather. Provide sufficient protection when daily temperatures drop below 40 degrees F.
- D. The Contractor shall conform to ACI 305R when mixing and placing concrete during hot weather. When air temperature exceeds 100 degrees F adjust concrete mix with retarding admixture in design mix, and adequately test and take additional measures as directed by concrete supplier.
- E. The Contractor shall maintain access for vehicular and pedestrian traffic as required for other construction activities. Use temporary striping, flagmen, barricades, warning signs, and warning lights as required.
- F. Placing in hot weather: Comply with ACI 305R. Concrete shall be delivered, placed and finished in a sufficiently short period of time to avoid surface dry checking.
 - 1. Concrete shall not exceed 85 degrees F at time of placement.
 - 2. Concrete shall be kept wet continuously after tempering until implementation of curing compound procedure in accordance with this specification.
 - 3. Evaporation Retarder: Apply evaporation retarder to concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 pounds per square foot per hour, before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.
- G. Placing in Cold Weather: Comply with ACI 306R. Protect from frost or freezing. No antifreeze admixtures are permitted.
 - 1. When placing concrete during freezing or near-freezing weather, mix shall have temperature of at least 50 degrees F but not more than 90 degrees F.
 - 2. Concrete shall be maintained at temperature of at least 50 degrees F for not less than 72 hours after placing or until it has thoroughly hardened.
 - 3. Provide necessary thermal coverings for any flat work exposed to freezing temperatures.

PART 2 - PRODUCTS

2.1 DESIGN AND PERFORMANCE CRITERIA

- A. Contractor shall comply with requirements applicable to this Section for concrete materials, admixtures, bonding materials, curing materials, surface sealers and others as required.
- B. Concrete walking surfaces shall have a coefficient of friction not less than 0.30 and will be subject to testing to verify compliance as specified in Article FIELD QUALITY CONTROL.
 - 1. The coefficient of friction will be measured by California Test 342 before pavement is opened to public traffic, but not sooner than 7 days after concrete placement.

2. Contractor shall notify the Architect and Project Inspector of pavement having a coefficient of friction less than 0.30.
- C. Sustainable Design:
1. VOC emissions for field-applied adhesives, sealants, and sealant primers must comply with limits specified in Section 01 6116.
 2. VOC emissions for field-applied paints and coatings must comply with limits specified in Section 01 6116.

2.2 FORMING MATERIALS

- A. Form Material: Steel, wood, or other suitable material of size and strength to resist movement during concrete placement and to retain horizontal and vertical alignment until removal. Use straight forms, free of distortion and defects. Use flexible spring steel forms or laminated boards to form radius bends as required. The forms shall be of a depth equal to the depth of curbing or sidewalk, and so designed as to permit secure fastening together at the tops. Coat forms with non-staining type coating that will not discolor or deface surface of concrete.
1. Concrete Exposed to View: 5/8-inch minimum APA B-B Plyform, steel or "Sonotube" forms by Sunoco, 888-875-8754, or equal.
 2. Concrete Concealed from View: 5/8-inch minimum APA B-B Plyform, steel or 1 x 8 DF, Number 2 Grade or better.
- B. Form Ties: Snap off metal of fixed length, leaving no metal within 1-1/2 inches of surface and no fractures, spalls or other surface defects larger than 1 inch diameter; manufactured by Burke, Dayton Superior, or equal.
- C. Spreaders: Metal. Wood is not permitted.
- D. Form Coating: Coat forms with non-staining material that will not discolor or deface surface of concrete or leave any residue on concrete that would interfere with surface coating as approved by the Architect.
- E. Chamfer Strips: Rigid polyvinyl chloride, 3/4-inch x 3/4-inch, in maximum possible lengths, manufactured by Burke, Greenstreak, Vulco, or equal.

2.3 REINFORCING MATERIALS

- A. Reinforcement Bars: New billet steel deformed bars conforming to requirements of ASTM A615/A615M or ASTM A706/A706M; Grade 60.
1. Bars for dowels installed through expansion joints or construction joints to existing sidewalks or concrete features shall be smooth or if deformed shall be sleeved on one end for slippage.
- B. Reinforcing Supports: Galvanized metal chairs or spacers or metal hangers, accurately placed 3 feet on center each way, staggered, with each support securely fastened to steel reinforcement in place.

1. Bottom bars in footings may be supported with 3-inch concrete blocks with embedded wire ties.
2. Concrete supports without wire ties will not be allowed.

2.4 CONCRETE MATERIALS

- A. Cement: Portland cement in accordance with ASTM C150/C150M, Type II, low alkali.
- B. Concrete Aggregates: Graded from coarse to fine in accordance with ASTM C33/C33M.
 1. Normal Weight Aggregates: Clean and free from deleterious coatings, clay balls, roots, and other extraneous materials, and in conformance with ASTM C33/C33M, except as otherwise specified. Combined grading shall meet limits of ASTM C33/C33M.
 - a. Size: Not be larger than one-fifth of the narrowest dimension between forms, or larger than three-fourths of the minimum clear spacing between reinforcing bars.
 2. Lightweight Aggregates:
 - a. General: Durable particles suitably processed, washed and screened without adherent coatings, free of materials with deleterious reactivity to alkali in cement, and conforming to ASTM C330/C330M.
 - b. Fine aggregate shall be natural sand, or sand prepared from stone or gravel, with grains free of silt, loam and clay.
- C. Water: Potable, clean, and in accordance with ASTM C94/C94M, free from injurious amounts of oil, acids, alkalis, salts, scale, organic materials or other deleterious matter, and in compliance with ACI 318 Section 26.4.1.3.
- D. Fly Ash: Western Fly Ash, conforming to ASTM C618 for Class N or Class F materials and in accordance with CBC Section 1903A.6.
 1. Class C is not permitted.
 2. Proportions: Not more than 15 percent (by weight) may be substituted for portland cement.

2.5 ADMIXTURES

- A. Water Reducing Admixture: Admixture to improve placing, reduce water cement ratio and ultimate shrinkage; "WRDA 64" by GCP Applied Technologies, or equal conforming to ASTM C494/C494M and ACI 318 Section 3.6.
 1. Water reducing admixture may be used subject to prior approval by the Architect, Engineer, and the Testing Lab.
 2. Proposed product and quantity shall be included in original design mix.
- B. Air-Entraining Admixture: "Daravair 1000" by GCP Applied Technologies or equal conforming to ASTM C260 and ACI 318, section 26.4.1.4.
 1. Proportion air entraining concrete to attain specified minimum 28-day compressive strength.

2. Total air entrainment in concrete shall be not less than 4 percent or more than 6 percent of the volume of concrete.
- C. Glare Reduction Colorant: Concentrated pigment dispersions designed to permanently color concrete; "Chromix L10 Base-Black" by Sika Corporation, or equal. *Was within 2.2 H.1*

2.6 CURING MATERIALS

- A. Clear Curing Compound: Water-based membrane-forming concrete curing compound in accordance with ASTM C309 and C1315; "Aqua Resin Cure Clear" by Burke CO, "1100" by W.R. Meadows, or equal.

2.7 ADDITIONAL MATERIALS AND COMPONENTS

- A. Concrete Bonding Agent: The following, or equal, conforming to ASTM C1059/C1059M.
 1. "Weld-Crete" by Larson Products Corporation, 800-633-6668.
 2. "Daraweld C" by GCP Applied Technologies, 877-423-6491.
- B. Patching Mortar: One-component, trowel applied, migrating-corrosion-inhibitor enhanced, polymer-modified, shrinkage-compensated, fiber reinforced, micro-silica enhanced, cementitious repair mortar for horizontal, vertical, and overhead applications; "Meadow-Crete GPS" by W.R. Meadows, or equal.
- C. Non-Shrink Grout: Premixed, non-metallic, no chlorides, non-staining and non-shrinking conforming to ASTM C1107/C1107M; "MasterFlow 713" by Master Builders Solutions, a division of BASF, 800-433-9517, or equal.
- D. Drainage Rock Base: 3/4-inch aggregate size conforming to Class 2 Aggregate Base as defined in Caltrans Standard Specifications Section 26, or equal clean free-draining gravel or crushed rock as recommended by the Geotechnical Engineer.
- E. Expansion Joint Material: Preformed 3/8-inch fiber material, with bituminous binder manufactured for use as concrete expansion joint material and conforming to ASTM D1751 and approved by Architect.
 1. Furnish joint fillers in one-piece lengths for full width being placed, wherever possible. Where more than one length is required, lace or clip joint-filler sections together.
- F. Joint Sealant for Expansion Joints in Concrete: Weather and UV resistant, single component, cold applied silicone sealant, Type S, conforming to ASTM D5893/D5893M; ASTM C920, Grade P, Class 25, Use T.
 1. Self-Leveling: "DOWSIL 890-SL Silicone Joint Sealant" by Dow Chemical Company, or equal.
 2. At Slopes Exceeding 5 Percent: Non-sagging; "DOWSIL 888 Silicone Joint Sealant" by Dow Chemical Company, or equal.
 3. Color: As standard with manufacturer.

- G. Pre-Formed Plastic Expansion Joint Caps: Polystyrene, with removable tops; "Snap Cap" by W. R. Meadows, Tex-Trude expansion caps, or equal.
- H. Truncated Domes: Vitrified Polymer Composite (VPC) cast-in-place detectable/tactile warning surface tiles complying with Americans with Disabilities Act (ADA) and the California Code of Regulations (CCR) Title 24, Part 2, Chapter 11B; "Armor-Tile", "Access Tile Tactile Systems," or equal.
 - 1. Color: Shall be yellow and approximate 33538 of GSA/SAE AMS-STD-595A in accordance with CBC Section 11B-705.1.1.3.1.
- I. Traffic Paint for Accessibility Striping at Stairs: VOC compliant, water-based, vinyl acrylic copolymer fast drying emulsion and specifically formulated as a traffic marking paint; "Setfast" with "Duckback" abrasive additive by Sherwin-Williams, "SAFE-STRIDE" by Wooster Products, Inc., or equal.
 - 1. Colors: As selected by Architect. [Yellow]
- J. Cast Abrasive Accessibility Strips and Stairs: Extruded aluminum with integral anchor and filled with abrasive granules in epoxy binder; Model ST-SF-N by Nystrom, Inc., 800-547-2635, Type T-24 by American Safety Tread Company, Inc., 800-245-4881, Type WP-24A by Wooster Products, Inc., 330-264-2844, or equal.
 - 1. Colors: As selected by Architect. [Yellow]

2.8 CONCRETE DESIGN AND CLASS

- A. Designed Strength and Classes of Concrete: The following mixes are not applicable to concrete items exceeding 4 feet in height above the adjacent grade.
 - 1. Class "B": Concrete shall have 1 inch maximum size aggregate, shall have 3000 pounds per square inch minimum at 28 day strength with a maximum water to cementitious ratio no greater than 0.50.
 - a. Location of Use: Exterior slabs, including walks, vehicular paved surfaces, manhole bases, poured-in-place drop inlets, curbs, valley gutters, curb and gutter, and other concrete of like nature.
 - 2. Class "D" concrete of 1 inch maximum size aggregate shall have 3500 pounds per square inch 28 day strength with a maximum water to cementitious materials ratio of 0.55.
 - a. Location of Use: Footings and retaining walls not attached to buildings, and planter walls, monument signs, and other site concrete not described for use in Class "B".
- B. Slump Limits: Provide concrete, at point of final discharge of proper consistency as tested in accordance with ASTM C143/C143M with slumps of 4 inches, plus or minus 1 inch.
- C. Mix Design: Concrete shall be designed for strength in accordance with provisions of CBC Section 1905A.

1. Should the Contractor desire to pump concrete, a modified mix design will need to be submitted for review.
 2. Fly ash may be used in concrete to improve workability in amounts up to 15 percent of the total cementitious weight.
- D. Air Entrainment: Provide at concrete paving / flatwork, including concrete ramps and stairs in accordance with local jurisdiction minimum requirements, but no less than 3 percent of the volume of concrete.
- E. Glare Reduction Additive:
1. General:
 - a. Provide at exterior concrete slabs, walks, ramps, stairs, including bleachers, and other exposed flatwork to eliminate glare.
 - b. Omit glare reduction colorant where color hardener, integral color, and stain treatment of concrete are scheduled.
 2. Quantity: As required to match approved sample but not exceed 2 pounds of colorant per cubic yard of concrete.
 3. Add colorant to mix in accordance with manufacturer's printed instructions.
- F. Coloring Agent:
1. Quantity: Add pigment as required to result in hardened concrete color consistent with approved sample but not exceeding maximum dosage per sack of cement as recommended by manufacturer based on total cementitious materials of mix design.
 2. Add pre-mixed colorant bags to mix in accordance with manufacturer's printed instructions.

2.9 MIXING OF CONCRETE

- A. Conform to requirements of CBC Chapter 19A.
- B. Concrete shall be mixed until there is uniform distribution of material and mass is uniform and homogenous; mixer must be discharged completely before the mixer is recharged.
- C. Concrete shall be Ready-Mixed Concrete: Mix and deliver in accordance with the requirements set forth in ASTM C94/C94M and ACI 301. Batch Plant inspection may be waived in accordance with CBC Section 1705A.3.3, when approved by the Project Engineer and DSA.
1. Furnish batch certificates for each batch discharged and used in the work.
 2. Approved Testing Laboratory shall check the first batching at the start of the work and furnish mix proportions to the Licensed Weighmaster.
 3. Licensed Weighmaster shall identify materials as to quantity and to certify to each load by ticket.
 4. Delivery tickets are to accompany each truck and shall be kept in the job superintendent's file. Delivery tickets must indicate the following information or be subject to rejection:

- a. Name of Project.
 - b. Supplier of concrete.
 - c. Truck identity and ticket serial number.
 - d. Date of delivery.
 - e. Brand of cement.
 - f. Cement content.
 - g. Strength classification.
 - h. Batching time.
 - i. Point of deposit.
 - j. Total amount of water.
 - k. Weight of aggregate.
 - l. Daily temperature.
 - m. Number of cubic yards in load.
 - n. Admixture content.
 - o. Name of Contractor.
 - p. Name of driver.
 - q. Time loaded and first mixing of concrete.
 - r. Reading of revolution counter.
 - s. Color additive.
5. Ticket shall be transmitted to Project Inspector by truck driver with load identified thereon. Project Inspector will not accept load without load ticket identifying mix and will keep daily record of pours, identifying each truck, its load and time of receipt, and will transmit two copies of record to DSA.
 6. At end of project, Weighmaster shall furnish affidavit to DSA on form satisfactory to DSA, certifying that all concrete furnished is in conformance with proportions established by mix designs.
 7. Placement of concrete shall occur as rapidly as possible after batching and in a manner which will assure that the required quality of the concrete is maintained. In no case may concrete be placed more than 90 minutes from batch time.
 - a. When air temperature is between 85 and 90 degrees F, reduce maximum batching to discharge time from 90 minutes to 75 minutes.
 - b. When air temperature is above 90 degrees F, reduce maximum batching to discharge time to 60 minutes.
 8. Water may be added to the mix only if neither the maximum permissible water-cement ratio nor the maximum slump is exceeded.
 - a. The quantity of water used for each batch shall be accurately measured.
 - b. In no case shall more than 10 gallons of water be added to a full 9-yard load, or 1 gallon per yard on remaining concrete within the drum, providing load tag indicates at time of mixing at plant an allowance for additional water.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Confirm general layout, grade, and joint pattern layout with the Architect prior to placing concrete.
- B. Verify that gradients and elevations of the base are correct, and that the base is dry.
- C. Contractor shall report in writing to the Architect prevailing conditions that will adversely affect satisfactory execution of the work of this Section.
 - 1. Do not proceed with work until unsatisfactory conditions have been corrected.
- D. Forms and reinforcements are subject to approval by the Project Inspector as specified in Article FIELD QUALITY CONTROL.

3.2 PREPARATION

- A. Remove frost, water, and other foreign materials from form surfaces, reinforcement, and embedded items against which concrete will be placed.
- B. When the ambient temperature necessitates the use of cold or hot weather concreting, make provisions in advance of concrete placement.
- C. Before placing concrete, clean tools and equipment, and remove debris from areas to receive concrete.
- D. Clean reinforcing and other embedded items of coatings, oil, mud and soil that may impair bond with concrete.
- E. Slab-On-Grade: After subgrade has been approved by Geotechnical Engineer, install specified drainage rock base material to thickness shown. Rock base shall be implemented and compacted in accordance with the Geotechnical Report and recommendations of the Geotechnical Engineer.

3.3 INSTALLATION – FORMWORK

- A. Form material shall be straight, true, sound and able to withstand deformation due to loading and effects of moist curing. Materials which have warped or delaminated, or require more than minor patching of contact surfaces, shall not be reused.
- B. Build forms to shapes, lines, grades and dimensions indicated. Construct formwork to maintain tolerances required by ACI 301. Forms shall be substantial, tight to prevent leakage of concrete, and properly braced and tied together to maintain position and shape. Butt joints tightly and locate on solid backing. Chamfer corners where indicated. Form bevels, grooves and recesses to neat, straight lines. Construct forms for easy removal without hammering, wedging or prying against concrete.
- C. Space clamps, ties, hangers and other form accessories so that working capacities are not exceeded by loads imposed from concrete or concreting operations.

- D. Build openings into vertical forms at regular intervals if necessary to facilitate concrete placement, and at bottoms of forms to permit cleaning and inspection.
- E. Build in securely braced temporary bulkheads, keyed as required, at planned locations of construction joints.
- F. Before placement of reinforcing steel, coat faces of all forms to prevent absorption of moisture from concrete and to facilitate removal of forms. Apply specified material in conformance with manufacturer's written directions.
 - 1. Seal all cut edges.
 - 2. Before re-using form material, inspect, clean thoroughly, and recoat.
- G. Slope tie-wires downward to outside of wall.
- H. Brace, anchor and support all cast-in items to prevent displacement or distortion.
- I. During and immediately after concrete placing, tighten forms, posts and shores. Readjust to maintain grades, levels and camber.
- J. Concrete Paving, Curbs, Curb and Gutters, Ramps:
 - 1. Expansion Joints: Install at locations indicated, and so that maximum distance between joints is 20 feet for exterior concrete unless otherwise shown. Expansion joint material shall be full depth of concrete section. Recess for snap cap and sealant when required.
 - 2. Curbs, Valley Gutter, and Curb & Gutter: Install expansion joints at 60 feet on center, except when placing adjacent to concrete walks, the expansion joints shall align with the expansion joints shown for the concrete walks. Expansion joint material shall be full depth of concrete section. Recess for snap cap and sealant when required.
 - 3. Isolation Joints: 3/8-inch felt between walls and exterior slabs or walks so that paved areas are isolated from all vertical features, unless specifically noted otherwise on plans.
 - 4. Exterior Concrete Paving: Install expansion joints at 20 feet on center maximum, both directions, unless shown otherwise on plans.
 - 5. Ramps: Whether shown or not, all ramps shall have control joints and expansion joints.
 - a. Control joints on ramps shall be aligned and placed in between the vertical posts for the handrails. The curbs, if required shall have control joints that align with the handrail posts.
 - b. Expansion joints shall be placed at the upper, intermediate, and bottom landings.
- K. Inspection: Refer to Article FIELD QUALITY CONTROL.

3.4 INSTALLATION – REINFORCING

- A. General: Reinforcing shall be accurately placed at locations indicated on the drawings within required tolerances and providing required clearances. Reinforcement shall be

secured prior to placement of concrete such that tolerances and clearances are maintained. Coverage shall be in accordance with Section 1907A.7 of the CBC.

1. Reinforcement must be in place before concreting is begun.
 2. Keep a person on the job to maintain position of reinforcing as concrete is placed.
 3. All expansion and construction joints in concrete shall have dowels of size and spacing as shown on the Drawings, or as approved by Architect.
 4. Give notice whenever pipes, conduits, sleeves, and other construction interferes with placement; obtain method of procedure to resolve interferences.
- B. Additional reinforcing steel shall be placed around all utility boxes, valve boxes, manhole frames and covers that are located within the concrete placements.
1. The bars shall be placed so that there will be a minimum of 1-1/2-inch clearance and a maximum of 3-inch clearance. The reinforcing steel shall be placed mid-depth of concrete slab.
- C. At right angles or intersections of concrete walks, additional 2 feet x 2 feet #5, 90 degree bars shall be added at all inside corners for additional crack control. The bars shall be placed 2 inches from concrete forms and supports, at mid-depth of slab.
- D. Reinforcing steel shall be adequately supported by approved devices on centers close enough to prevent any sagging.
- E. Placing Tolerances:
1. In accordance with ACI 301 or CRSI/WCRSI Recommended Practice for Placing Reinforcing Bars, unless otherwise shown.
 2. Clear distance between parallel bars in a layer shall be no less than 1 inch, the maximum bar diameter shall not exceed 1-1/2 times the maximum size of coarse aggregate.
- F. Splices:
1. General: Unless otherwise shown on drawings, splice top reinforcing at midspan between supports, splice bottom reinforcing at supports, and stagger splices. Bar laps shall be wired together. Reinforcing steel laps shall be as follows:
 - a. Length of Lap Splices in Concrete:
 - 1) No. 4 bar: 24 inches minimum.
 - 2) No. 5 Bar: Not less than 62 bar diameters.
 - 3) No. 6 Bar: 56 inches minimum.
 - 4) No. 7 Bars and Larger: Not less than 93 bar diameters.
 - b. All splices shall be staggered at 5 feet minimum from adjacent splices.
- G. Inspection: Refer to Article FIELD QUALITY CONTROL.

3.5 PLACING OF CONCRETE – GENERAL

- A. Adjacent finish surfaces shall be protected at all times during the concrete pour and finishing. Verify that all formwork is tight and leak-proof before concrete is poured. Finish work defaced during the concrete pour and finishing shall be replaced at no extra cost to Owner.
- B. Remove wood chips, sawdust, dirt, loose concrete and other debris just before concrete is to be poured. Use compressed air for inaccessible areas. Remove all standing water from excavations.
- C. Transport concrete from mixer to place of final deposit as rapidly as practicable by methods which will prevent separation or loss of ingredients. Deposit as close as practicable in final position to avoid re-handling or flowing. Partially hardened concrete must not be deposited in work. Concrete shall not be wheeled directly on top of reinforcing steel.
- D. Keep excavations free of standing water, but moisture condition sub-grade before concrete placement.
- E. Placing: Once started, continue concrete pour continuously until section is complete between predetermined construction joints. Prevent splashing of concrete onto adjacent forms or reinforcement and remove such accumulation of hardened or partially hardened concrete from forms or reinforcement before work proceeds in that area. Free fall of concrete shall not to exceed 4'-0" in height. If necessary, provide lower openings in forms to inject concrete and to reduce fall height.
- F. Remove form spreaders as placing of concrete progresses.
- G. Place footings as monolithic and in one continuous pour.
- H. Compacting: Concrete shall be compacted by mechanical vibrators.
 - 1. Concrete shall be thoroughly worked around reinforcement and embedded fixtures and into corners of forms.
 - 2. Vibrating shall not be applied to concrete which has already begun to initially set or be continued so long as to cause segregation of materials.

3.6 REMOVAL OF FORMS

- A. Remove without damage to concrete surfaces.
 - 1. Sequence and timing of form removal shall insure complete safety of concrete structure.
 - 2. Forms shall remain in place for not less than the following periods of time. These periods represent cumulative number of days during which temperature of air in contact with concrete is 60 degrees F and above.
 - a. Vertical Forms of Foundations, Walls and All Other Forms Not Covered Below: 5 days.
 - b. Concrete Paving Edge Screeds or Forms: 7 days.

3. Concrete shall not be subjected to superimposed loads (structure or construction equipment) until it has attained its full design strength and not for a period of at least 21 days after placing. Concrete systems shall not be subjected to construction loads in excess of design loads.
- B. Patching: Install specified patching mortar per manufacturer's recommendations. Repairs to defective concrete which affect the strength of any structural concrete member or component are subject to approval by the architect and DSA.

3.7 CONCRETE PAVING

- A. Concrete paving shall be formed and finished to required line and grades true and flat with a maximum tolerance of 1/8-inch in 10 feet for flatness and to slopes indicated.
- B. Concrete vibrator shall be used to assist concrete placement. Contractor shall have spare concrete vibrator on site during concrete placement.
- C. Thoroughly water and soak the subgrade of exterior concrete paving, curbs, curb and gutters, with multiple daily waterings for at least three days or as required to achieve required moisture content prior to the concrete pour in order to place the subgrade soils in full expansion.
 1. Provide damming as required to keep standing water within the formed area and to allow for proper saturation and full expansion of the subgrade soils.
 2. Remove standing water before concrete placement.
- D. Construction Joints:
 1. Keep exposed concrete face of construction joints continuously moist from time of initial set until placing of concrete; thoroughly clean contact surface by chipping entire surface not earlier than 5 days after initial pour to expose clean hard aggregate solidly embedded, or by approved method that will assure equal bond, such as green cutting.
 2. If contact surface becomes contaminated with soil, sawdust or other foreign matter, clean entire surface and re-chip entire surface to assure proper adhesion.

3.8 FINISHING

- A. Concrete Paving: Finish surface as required by ACI 302.1R using manual and vibrating screeds to place concrete level and smooth.
 1. Under no circumstances shall water be added to the top surface of freshly placed concrete.
 2. Use "jitterbugs" or other special tools designed for the purpose of forcing the course aggregate below the surface leaving a thick layer of mortar 1 inch in thickness.
 3. After tamping the concrete, wood float surface to a true and even plane.
 4. After floating with a wood bull float, make 2 passes with a steel Fresno trowel to start sealing the concrete surface.

5. While concrete is still wet but sufficiently hardened to bear a persons' weight on knee boards, start troweling with a steel hand trowel or a machine trowel in larger areas. Use sufficient pressure to bring moisture to surface.
 6. After surface moisture has disappeared, finish concrete utilizing steel, hand or power trowel.
 7. Completed surface shall be free from trowel marks, depressions, ridges or other blemishes. Tolerance for flatness shall be 1/8-inch in 10 feet.
 8. Provide final finish as follows, unless otherwise indicated:
 - a. Medium Broom Finish: Typical finish to be used at all exterior walks, stairs and ramps. Brooming direction shall run perpendicular to slope to form non-slip surface.
- B. Curb Finish: Steel trowel.
- C. Joints and Edges:
1. Mark-off exposed joints, where indicated, with 1/4-inch radius x 1 inch deep jointer or edging tool. Joints shall be clean, cut straight and parallel or square with respect to concrete walk edge.
 2. Tool edges of control joints, walk edges, and wherever concrete walk adjoins other material or vertical surfaces. Expansion joints shall be constructed as detailed on plans.
 3. The expansion joints shall be full depth as shown in the Drawings. Failure to do so will result in non-compliance and shall be immediately machine cut by the Contractor at its expense.

3.9 CURING

- A. Formed Concrete:
1. Keep forms and top on concrete between forms continuously wet until removal of forms, 7 days minimum.
 2. Maintain exposed concrete in a continuous wet condition for 14 days following removal of forms.
- B. Concrete Paving, Curb, Curb and Gutter, Valley Gutter:
1. Cure utilizing curing compound. If applicable, the Contractor shall verify that the approved curing compound is compatible with the approved colorant system.
 2. Curing compound shall be applied in a wet puddling application. Spotty applications shall be reason for rejection and possibly concrete removal and replacement at the contractor's expense with no compensation from the Owner.
- C. No curing compound shall be applied to areas scheduled to receive resilient track surface including, curbs, ramps, runways, and similar items.

3.10 DEFECTIVE CONCRETE

- A. General:

1. Determination of defective concrete shall be made by the Architect or Engineer whose opinion shall be final in identifying areas to be replaced, repaired or patched.
2. As directed by Architect, cut out and replace defective concrete.
 - a. Defective concrete shall be removed from the site.
 - b. No patching is to be done until surfaces have been examined by Architect and permission to begin patching has been provided.
 - c. Permission to patch an area shall not be considered waiver of right by the Owner to require removal of defective work, if patching does not, in opinion of Architect, satisfactorily restore quality and appearance of surface.
 - d. Remove and replace concrete if repair to an acceptable condition is not feasible.

B. Defective Concrete Is:

1. Concrete that does not match the approved mix design for the given installation type.
2. Concrete not meeting specified 28-day strength.
3. Concrete which contains rock pockets, voids, spalls, transverse cracks, exposed reinforcing, or other such defects which adversely affect strength, durability or appearance.
4. Concrete which is incorrectly formed, out of alignment or not plumb or level, or outside of the maximum tolerance for flatness and slopes indicated.
5. Concrete containing embedded wood or debris.
6. Concrete having large or excessive patched voids which were not completed under Architect's direction.
7. Concrete not containing required embedded items.
8. Concrete with excessive shrinkage, transverse cracking, crazing, curling; or defective finish.
9. Concrete that is unsuitable for placement or has set in truck drum for longer than 90 minutes from the time it was batched.
10. Concrete where expansion joint filler that is not isolating the full depth of the concrete section, and not recessed as required for backer rod and sealant where required.
11. Concrete that is excessively wet or excessively dry and will not meet the minimum or maximum slump required per mix design.
12. Finished concrete with oil stains from equipment use, and or rust spots that cannot be removed.
13. Concrete with control joints (weakened planed joints) that do not meet the required minimum depth shown on the drawings.
14. Concrete not meeting slip-resistance requirements.

C. Flatwork: The Owner reserves the right to survey the flatwork, to determine if flatwork is outside of the maximum tolerance for flatness and slopes as indicated.

1. If the flatwork is found to be out of tolerance, then the Contractor is required to replace concrete at no additional expense to the Owner.
2. Determination of flatwork flatness, surveying and remedial work must be completed far enough in advance so that the project schedule is maintained, delays are avoided, and the new flatwork or flatwork repairs are properly cured.
3. The Contractor will be responsible for reimbursing the Owner for costs associated with re-surveying to verify compliance of work remediated by the Contractor.

3.11 SEALANT

- A. Apply sealant in compliance with manufacturer's instructions, using hand guns or pressure equipment with proper nozzle size, on clean, dry, properly prepared substrates.
- B. Force sealants into joint against sides of joint to make uniform. Avoid pulling of the sealant from the sides. Fill sealant space completely with sealant.
- C. Finished joints shall be straight, uniform, smooth, and neatly finished.
- D. Remove any excess sealant from adjacent surfaces of joints utilizing the manufacturer's recommended solvent and cleaning processes. Leave the work in a neat, clean condition.

3.12 FIELD QUALITY CONTROL

- A. Inspection of Forms and Reinforcing:
 1. Approval of forms and reinforcing steel must be received from Project Inspector prior to pouring concrete.
 2. Notice of readiness to place first pour shall be given to Project Inspector, DSA, Architect, and Engineer not less than 48 hours prior to placement of concrete to allow for inspection.
 3. Pouring of concrete shall not proceed prior to completing requested adjustments to forms and reinforcing and without approval of Project Inspector.
- B. Testing of Concrete:
 1. Frequency and Samples for Testing:
 - a. Four identical cylinder samples for strength tests of each class of concrete placed each day shall be taken not less than once a day, or not less than once for each 50 cubic yards of concrete, or not less than once for each 2,000 square feet of surface area for slabs or walls.
 - b. In addition, samples for strength tests for each class of concrete shall be taken for seven-day tests at the beginning of the concrete work or whenever the mix or aggregate is changed.
 2. Testing:
 - a. Slump: Each truck's concrete shall be tested for slump before concrete is placed.
 - b. Strength:

- 1) Tests for strength will be conducted by Testing Agency on one cylinder at 7 days and two cylinders at 28 days. The fourth remaining cylinder will be available for testing at 56 days if the 28-day cylinder test results do not meet the required design strength.
 - 2) On a given project, if the total volume of concrete is such that the frequency of specified testing would provide less than five strength tests for a given class of concrete, tests shall be made from at least five randomly selected batches or from each batch if fewer than five batches are used.
- C. Slip-Resistance Testing: Owner's Testing Agency will perform testing on flatwork to verify compliance with specified slip-resistance.
1. The coefficient of friction will be measured by California Test 342 before pavement is opened to public traffic, but not sooner than 7 days after concrete placement
 2. Where paving is determined to have a coefficient of friction less than 0.30, Contractor is to repair and/or replace these surfaces at no cost to Owner.

3.13 CLEANING

- A. Upon completion of work of this Section promptly remove from the working area all scraps, debris and surplus material of this Section.
- B. Clean excess material from surface of all concrete walks and utility structures.
- C. Power wash concrete surfaces to remove stains, dried mud, tire marks, and rust spots.
- D. Comply with any additional requirements of additive manufacturer for colored concrete.

3.14 PROTECTION

- A. Graffiti-resistant Coating:
 1. Surface Preparation: Prepare concrete surface to receive graffiti-resistant coating specified in Section 09 9623, Graffiti-Resistant Coatings, where indicated.
 2. Concrete must be clean, dry, and free of efflorescence and dust.
- B. Protect work and materials of this Section prior to and during installation, and protect the installed work and materials of other trades.
- C. In the event of damage during construction, make all repairs and replacements necessary to the approval of the Architect, at no additional cost to the Owner.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

A. Scope of Work:

1. Furnish all labor, materials, tools, equipment, and transportation required to perform and complete the installation of an automatic sprinkler irrigation system, including all piping, sprinkler heads, controls, connections, testing, etc. as shown on the Drawings and as specified herein. The water source for this project is potable water.
2. Utilize and accept as standards manufacturer's recommendations and/or installation details for any information not specifically detailed on the Drawings.

1.2 RELATED REQUIREMENTS

- A. Section 01 6116, Volatile Organic Compound (VOC) Restrictions, for VOC limits pertaining to adhesives, sealants, fillers, primers, and coatings.
- B. Section 01 8113, Sustainable Design Requirements, for CAL-Green general requirements and procedures.
- C. Section 31 0000, Earthwork.
- D. Section 31 2333, Trenching and Backfilling.
- E. Section 32 9000, Landscaping.

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CALGreen), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).

1.4 ADMINISTRATIVE REQUIREMENTS

A. Submittal Procedures:

1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
3. Sustainable Design Submittals shall comply with the additional requirements of Section 01 8113, Sustainable Design Requirements

**IRRIGATION
SECTION 32 8000
3595001**

B. Pre-Installation Meeting:

1. Request and hold a pre-installation meeting prior to beginning the work of this Section. Parties required to be in attendance are the Landscape Contractor, Project Inspector, Owner's Representative, and the Landscape Architect.

1.5 ACTION SUBMITTALS

- A. Product names are used as standards; provide proof as to equality of any proposed material and do not use other materials or methods unless approved in writing by the Owner's Representative. Submit no more than one request for substitution for each item. The decision of the Owner's Representative is final.
- B. Use equipment capacities specified herein as the minimum acceptable standards.
- C. List materials in the order in which they appear in Specifications; include substitutions. Submit the list for approval by the Owner's Representative.
- D. Make any mechanical, electrical, or other changes required for installation of any approved, substituted equipment to satisfaction of Owner's Representative and without additional cost to Owner. Approval by Owner's Representative of substituted equipment and/or dimensional drawing does not waive these requirements.
- E. Do not construe approval of material as authorization for any deviations from Specifications unless attention of Owner's Representative has been directed to specified deviations.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data for the following:
 1. For landscape contractor.
- B. Sample of manufacturers' warranty.
- C. Record of Pre-Installation Meeting.
- D. Sustainable Design:
 1. General:
 - a. Submit information necessary to establish and document compliance with the California Green Building Standards Code.
 - b. Sustainable design submittals are in addition to other submittals.
 2. The following information shall be provided:
 - a. Adhesives and Sealants: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.
 - b. Paints and Coatings: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.

1.7 CLOSEOUT SUBMITTALS

- A. Warranty/Guarantee: Submit executed warranty and subcontractor's guarantee.
- B. Maintenance and Operating Instructions:
 - 1. Furnish operating maintenance instructions bound in a hardback binder and indexed. Start compiling data upon approval of list of materials. Do not request final inspection until booklets are approved by Owner's Representative.
 - 2. Incorporate the following information in these sets:
 - a. Complete operating instructions for each item of irrigation equipment.
 - b. Typewritten maintenance instructions for each item of irrigation equipment.
 - c. Manufacturer's bulletins which explain installation, service, replacement parts, and maintenance.
 - d. Service telephone numbers and/or addresses posted in an appropriate place as designated by Owner's Representative.
- C. Record Drawings.

1.8 QUALITY ASSURANCE

- A. Qualifications: Work must be complete by a licensed Landscape Contractor. Provide proof of five years' continuous experience in landscaping and irrigation of projects of similar size.
- B. Certification: Ensure that the contractor installing the Central Control System is trained and certified in the installation of the Central Control System. The training and certification must have been completed within two years prior to the installation date.
- C. Work Force: Ensure that an experienced foreman is present at all times during installation. Keep the same foreman and workers on the job from commencement to completion.
- D. Reviews: Specifically request reviews of all items listed in Article INSPECTION REQUIREMENTS, prior to progressing to the next level of work.
- E. Standards:
 - 1. Provide work and material in full accordance with the rules and regulations of the National Electric Code; the Uniform Plumbing Code; and other applicable state or local laws or regulations.
 - 2. Furnish, without extra charge, additional material and labor required to comply with these rules and regulations, though the work may not be specifically indicated in the Specifications or Drawings.
 - 3. Where the Specification requirements exceed those of the above-mentioned codes and regulations, comply with the requirements in the Specifications.

1.9 DELIVERY, STORAGE AND HANDLING

- A. Transport, store and handle in strict conformance with the manufacturer's written recommendations.
- B. Deliver undamaged products to job in manufacturer's sealed containers and/or original bundles, with tags and labels intact. All material containers or certificates shall be clearly marked by manufacturer as to contents for inspection.
- C. Store materials in original undamaged packages and containers, inside well-ventilated area protected from weather, moisture, soilage, extreme temperatures, and humidity. Lay flat, blocked off ground.
- D. Use all means necessary to protect irrigation system materials before, during, and after installation and to protect related work and material.
- E. Handle plastic pipe carefully, especially protecting it from prolonged exposure to sunlight. Store pipe on beds that are the full length of the pipe, and keep pipe flat.

1.10 FIELD CONDITIONS

- A. Information on Drawings relative to existing conditions is approximate. During progress of construction, make deviations necessary to conform to actual conditions, as approved by Owner's Representative, without additional cost to Owner. Accept responsibility for any damage caused to existing services. Promptly notify Owner's Representative if services are found which are not shown on Drawings.
- B. Protect existing trees-to-remain as specified in "Existing Tree Protection" in Article PREPARATION, in Part 3 of this Section.
- C. Protect existing utilities within construction area. Repair damages to utility lines that occur as a result of operations of this work.
- D. Verify dimensions at building site and check existing conditions before beginning work. Make changes necessary to install work in harmony with other crafts after receiving approval by Owner's Representative.

1.11 INSPECTION REQUIREMENTS

- A. Obtain verification from Project Inspector for the following at the appropriate times during construction and prior to further progression of work in this Section:
 - 1. Pressure testing of all mainlines and lateral lines (See "Hydrostatic Tests – Open Trench" in Article FIELD QUALITY CONTROL, in Part 3 of this Section),
 - 2. Trench depth,
 - 3. Sleeves under pavement,
 - 4. Flushing of all mainlines and lateral lines,
 - 5. Backfill and pipe bedding,

6. Layout of heads,
 7. Operation of system and coverage adjustments (with Landscape Architect) after system is fully automated and operational, backfill of trenching is completed, and surface has been restored to original grades.
- B. In case of failure to obtain any verification by the Project Inspector as required above, remove and replace work as necessary to obtain the verification at no additional cost to the Owner.

1.12 WARRANTY AND GUARANTEE

- A. Manufacturer: In addition to the Contractor's and Subcontractor's Guarantee, furnish Owner with manufacturer's available fully executed written warranty against defects in materials and workmanship.
- B. Subcontractor Guarantee: Shall include damage by leaks and settlement of irrigation trenches.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Use materials as specified; any deviation from the Specifications must first be approved by the Owner's Representative in writing.

2.2 DESIGN AND PERFORMANCE CRITERIA

- A. Sustainable Design:
1. VOC emissions for field-applied adhesives, sealants, and sealant primers must comply with limits specified in Section 01 6116.
 2. VOC emissions for field-applied paints and coatings must comply with limits specified in Section 01 6116.

2.3 MATERIALS

- A. Automatic Control Valves: As indicated on Drawings.
- B. Gate Valve: As indicated on Drawings.
- C. Pipe and Fittings:
1. PVC pipe: As indicated on Drawings.
 2. PVC fittings three-inch (3") size and smaller: High impact, standard weight, Schedule 40, molded PVC as manufactured by George Fischer, Lasco, Spears, or approved equal.

IRRIGATION
SECTION 32 8000
3595001

3. PVC fittings four-inch (4") size and larger: High impact, standard weight, Class 200 gasketed, molded PVC as manufactured by George Fischer, Lasco, Spears, or approved equal.
 4. All plastic pipe and fittings: Continuously and permanently marked with manufacturer's name, type of material, IPS size, schedule, NSF approval, and code number.
 5. Threaded PVC pipe and nipples: IPS Schedule 80 when necessary to use threaded connections to gauges, valves, or control valves. Threaded adapters may be used in place of nipples when making pipe to valve connections.
 6. Use 45-degree fittings for changes in depth of pipe, and at transition from main line to automatic control valves.
 7. Piping above ground: Schedule 40 galvanized steel with cast-iron fittings.
- D. PVC Primer: Weld-On P-70 Purple Primer or approved equal.
- E. PVC Glue: Weld-On 711 Gray heavy bodied PVC Cement or approved equal.
- F. Sprinkler Heads: As indicated on Drawings.
- G. Quick Coupler Valves: As indicated on Drawings.
- H. Sleeves: As indicated on Drawings.
- I. All Valve Boxes and Covers: Manufactured, green with "Irrigation – Non-Potable" permanently embossed on cover. Carson, Rainbird or approved equal.
- J. Reduced Pressure Backflow Preventer: As indicated on Drawings.
- K. Automatic Sprinkler Control Wire:
1. Connections between remote control valves and controller: UF-14 direct burial polyethylene (PE) insulated wire, Paige Electric P7079D or approved equal. Common wire to be white, and lead wire to be colored. If multiple controllers are used, a different color is to be used for each controller's lead wire. (Use red for the first controller). Spare wires are to be yellow.
 2. UL Listed waterproof sealing pack for wire connections: 3M DBR/Y-6, or approved equal.
 3. Provide adequate working space around electrical equipment in compliance with local codes and ordinances.
 4. Electrical, other than low voltage, such as power wiring, conduit, fuses, thermal overloads and disconnect switches, is included under Division 26 of these Specifications.
- L. Unions And Flanges:
1. Steel unions and flanges two inches (2") and smaller: 150 lb. screwed black (brass to iron seat) or galvanized malleable iron (ground joint).

2. Steel unions and flanges two and one-half inches (2 ½") and larger: 150 lb. black flange union, flat-faced, full gasket.
 3. Gaskets: One-sixteenth inch (1/16") thick rubber Garlock No. 122, Johns-Manville or approved equal.
 4. Flange Bolts: Open-hearth bolt steel, square heads with cold pressed hexagonal nuts, cadmium plated in ground. Provide copper-plated steel bolts and nuts or brass bolts and nuts for brass flanges.
- M. Sand for Trench Backfill: Natural sand, free of roots, bark, sticks, rags, or other extraneous material

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Prior to commencement of the work of this Section, obtain written verification from the project Civil Engineer that the rough grade in landscape areas is in conformance with Section 31 0000 - Earthwork.
- B. Examine conditions of work in place before beginning work; report defects.

3.2 PREPARATION

- A. Scheduling: Notify the Project Inspector prior to commencing and/or continuing the work of this Section. Remove and replace, at no cost to Owner, any work required as a result of failure to give the appropriate notification.
- B. Measurements: Take field measurements; report variance between plan and field dimensions.
- C. Protection: Maintain warning signs, shoring and barricades as required. Prevent injury to, or defacement of, existing improvements. At no additional cost to Owner, repair or replace items damaged by installation operations.
- D. Existing Tree Protection:
 1. Avoid unnecessary root disturbance, compaction of soils within drip line, or limb breakage.
 2. Do not store material or dispose of any material other than clean water within the drip line.
 3. Provide adequate irrigation during construction.
 4. Replace any tree damaged during construction with a tree of equal size and value at no additional cost to Owner.
 5. Adjust trench locations in field to minimize damage to existing elements and plant roots of trees-to-remain at no additional cost to Owner.

**IRRIGATION
SECTION 32 8000
3595001**

- E. Surface Preparation: Prior to beginning sprinkler irrigation work, complete placement of topsoil as specified in Section 31 0000 – Earthwork. Notify Project Inspector of irregularities if any.

3.3 AUTOMATIC CONTROLLER

- A. Connect automatic control valves to controller(s) in sequence as shown on Drawings.
- B. Install all exposed wires to a minimum of twenty-four inches (24") beyond controller within a UL approved rigid conduit.

3.4 GRADING

- A. Install all irrigation features to their finished grade and at depths indicated. Complete and /or accommodate all rough grading and/or finish grading before commencing with trenching.

3.5 LAYOUT

- A. Lay out work as accurately as possible to Drawings. Drawings are generally diagrammatic to extent that swing joint offsets and fittings are not shown. Record all changes on the Record Drawings.
- B. Do not willfully install the irrigation system as shown on Drawings when it is obvious, in the field, that obstructions or other discrepancies exist which may not have been considered in the design. Notify Owner's Representative of discrepancies before proceeding.

3.6 EXCAVATING AND TRENCHING

- A. General: Perform excavations as required for installation of work included under this Section, including shoring of earth banks to prevent cave-ins. Restore surfaces, existing underground installations, etc., damaged or cut as result of this work to their original condition and in a manner approved by the Landscape Architect.
- B. Width:
 - 1. Make trenches wide enough to allow a minimum of six inches (6") between parallel pipelines and three inches (3") between side of pipe and side of trench. Do not allow stacking of pipe within trench.
 - 2. Allow a minimum clearance of twelve inches (12") in any direction from parallel pipes of other trades.
- C. Preparation of Excavations: Remove rubbish and rocks from trenches. Bed pipe on a minimum of three inches (3") of clean, rock-free soil to provide a firm, uniform bearing for entire length of pipeline. If clean, rock-free soil is not available, use sand for pipe bedding. See Backfill and Compacting for the remainder of the trench backfill.

- D. Minimum depth of cover: Unless shown otherwise, provide the following minimums:
 - 1. Mainline: twenty-four inches (24") cover.
 - 2. Lateral line: twelve inches (12") cover for spray heads, and eighteen inches (18") cover for rotor heads.
- E. Conflicts with other trades:
 - 1. Hand-excavate trenches where potential conflict with other underground utilities exist.
 - 2. Where other utilities interfere with irrigation trenching and piping work, adjust the trench depth as instructed by Owner's Representative.

3.7 BACKFILL AND COMPACTING

- A. General: Do not begin until hydrostatic tests are completed and when system is operating and after required tests and inspections have been made.
- B. Backfill directly around the pipe: Cover pipe with a minimum of three inches (3") of clean, rock-free soil. If clean, rock-free soil is not available, use sand for three inches (3") of backfill above the pipe. The remainder of the trench backfill material can be native soil or material described below. Do not allow wedging or blocking of pipe.
- C. For backfill of trenches under paving areas:
 - 1. See Section 31 0000 – Earthwork for compaction rates and material
 - 2. See Section 31 2333 – Trenching and Backfilling for trench backfill procedure.
- D. For backfill of trenches in landscape areas:
 - 1. Place backfill in six-inch (6") layers and compact with an acceptable mechanical compactor.
 - 2. Compact backfill material in landscape areas to eighty-five percent (85%) maximum dry density of the soil.
 - 3. If settlement occurs along trenches, make adjustments in pipes, valves, and sprinkler heads, soil, sod or paving as necessary to bring the system, soil, sod or paving to the proper level or the permanent grade, without additional cost to the Owner.
- E. Excess Soil: Remove all rocks, debris, and excess soil that results from sprinkler irrigation trenching operations, landscape planting, and soil preparation operations off site at no additional cost to the Owner. If soil meets topsoil requirements in Section 31 0000 – Earthwork, it may be used for finish grading.
- F. Finishing: Dress-off areas to eliminate construction scars.

**IRRIGATION
SECTION 32 8000
3595001**

3.8 CONTROL WIRES

- A. General: Install control wires beneath sprinkler main line whenever possible; tape wires to mainline pipe. Provide one spare wire for each controller.
- B. Slack Wire: Provide eighteen inches (18") of slack wire for each wire connected to automatic control valve. Slack wire shall be coiled and left in the valve box. Tape wires in bundles every ten feet (10'); do not tape wires in sleeves.
- C. Expansion and Contraction: Snake wire in trench to allow for contraction of wire.
- D. Wire Passing Under Existing or Future Paving or Construction: Encase in PVC Schedule 40 or galvanized steel conduit extending at least twelve inches (12") beyond edges of paving or construction.
- E. Wire Connections: Install wire connections in a waterproof sealing pack.
- F. Wire Splicing: Permit splicing only on runs exceeding 500 feet. Locate all splices within valve boxes.
- G. Wire Termination: Install wire in a valve box with eighteen inches (18") of slack wire coiled and individually capped with approved waterproof sealing pack.
- H. Spare Wire: Install two (2) spare wires along each wire path. If there is more than one wire path from the controller, the contractor to install two (2) spare wires per path. Provide eighteen inches (18") of slack wire at each automatic control valve.

3.9 FLUSHING LINES

- A. Thoroughly flush lines prior to installing valves, performing hydrostatic testing, or installing sprinklers. Divert water to prevent washouts.

3.10 AUTOMATIC CONTROL AND QUICK COUPLER VALVES

- A. Install where shown and where practical; place no closer than twelve inches (12") to walk edges, building walls, or fences. Refer to detail for example.
- B. Thoroughly flush mainline before installing valve.
- C. Install valves in ground cover areas where possible.

3.11 PIPING

- A. General: Install in conformance with reference standards, manufacturer's written directions, as shown on Drawings and as herein specified.
- B. Workmanship:
 - 1. General: Install sprinkler irrigation equipment in planted areas throughout the site.
 - 2. Coordination: Organize location of sleeves with other trades as required.

C. Pipe Line Assembly:

1. General:
 - a. Cutting: Cut pipe square; remove rough edges or burrs.
 - b. Solvent-welded Connections: Use materials and methods recommended by the pipe manufacturer.
 - c. Brushes: Use non-synthetic brushes to apply solvents and primer.
 - d. Cleaning: Clean pipe and fittings of dirt, moisture, and debris prior to applying solvent or primer.
 - e. Assembly: Allow pipe to be assembled and welded on the surface or in the trench.
 - f. Expansion and Contraction: Snake pipe from side to side of trench to allow for expansion and contraction.
 - g. Location: Locate pipes as shown on Drawings except where existing supply valves, utilities or obstructions prohibit or where slight changes are approved to better suit field conditions.
2. Flexible Elastometric Seal Joints:
 - a. General: Assemble in strict conformance with the pipe manufacturer's instruction.
 - b. Rubber Rings: Use rubber rings specific for water service systems.
 - c. Cleaning: Thoroughly clean ring and groove of dirt, moisture and debris using a clean, dry cloth. Do not use solvents, lubricants, cleaning fluids or other material for cleaning.
 - d. Seating: Properly seat ring in groove.
 - e. Spigot:
 - 1) General: Clean spigot-end of pipe as in "Cleaning" above prior to applying lubricant recommended by pipe manufacturer.
 - 2) Seating: Insert spigot into bell and seat to full depth required.
3. Connections:
 - a. Threaded Plastic Pipe Connection:
 - 1) Use Teflon tape or pipe joint compound.
 - 2) When assembling to threaded pipe, take up joint no more than one full turn beyond hand-tight.
 - b. Metal Valves and Plastic Pipe: Use threaded plastic male adapters.
 - c. Metal to Metal Connections:
 - 1) Use specific joint compound or gasket material for type of joint made. Where pipe of dissimilar metals are connected, use dielectric fittings.
 - 2) Where assembling, do not allow more than three full threads to show when joint is made up.
 - d. Where assembling soft metal (brass or copper) or plastic pipe, use strap-type friction wrench only; do not use a metal-jawed wrench.
 - e. Threading:

**IRRIGATION
SECTION 32 8000
3595001**

- 1) Do not permit the use of field-threading of plastic pipe or fittings. Use only factory-formed threads.
 - 2) Use factory-made nipples wherever possible. Permit the use of field-cut threads in metallic pipe only where absolutely necessary. When field-threading, cut threads accurately on axis with sharp dies.
 - 3) Use pipe joint compound for all threaded joints. Apply compound to male thread only.
4. Sleeves and conduits:
- a. Use sleeves of adequate size to accommodate retrieval for repair of wiring or piping and extend a minimum of twelve inches (12") beyond edges of walls or paving.
 - b. Provide removable, non-decaying plug at end of sleeve to prevent entrance of soil.
5. Unions: Locate unions for easy removal of equipment or valve.
6. Capping: Plug or seal opening as lines are installed to prevent entrance materials that would obstruct pipe. Leave in place until removal is necessary for completion of installation.

3.12 SPRINKLER HEADS

- A. Sprinkler heads: Locate as shown on the Drawings except where existing conditions prohibit, or slight changes are approved to achieve as good or better coverage under the same conditions. Do not allow sprinkler head spacing to exceed the maximum shown on the Drawings. Plumb heads.
- B. Handling, Assembly of Pipe, Fittings, and Accessories: Allow only skilled tradesmen to handle and assemble pipe, fittings and equipment. Keep interior of pipes, fittings and accessories clean at all times. Close ends of pipe immediately after installation; leave closure in place until removal is necessary for completion of installation. Do not permit bending of pipe.
- C. Flushing: Remove end heads and operate system at full pressure until all rust, scale, and sand is removed. Divert water to prevent ponding or damage to finished work.
- D. Coverage: Accept responsibility for full and complete coverage of irrigated areas to satisfaction of Landscape Architect and make necessary adjustments to better suit field conditions at no additional costs to Owner.

3.13 FIELD QUALITY CONTROL

- A. Visual Inspection: Verify that all pipe is homogenous throughout and free from visual cracks, holes, or foreign materials. Inspect each length of pipe. All materials are subject to impact test at the discretion of the Landscape Architect.

B. Hydrostatic Tests – Open Trench:

1. Center-load piping with a small amount of backfill to prevent arching or slipping under pressure.
2. Request the presence of the Project Inspector in writing at least forty-eight hours in advance of testing.
3. At no additional cost to Owner, test in the presence of the Project Inspector.
4. Apply continuous static water pressure of 100 psi when welded plastic joints have cured at least twenty-four hours, and with the risers capped, as follows: test main lines and submains for four hours; test lateral lines for two hours.
5. Repair leaks resulting from tests; and repeat tests.
6. Test to determine that all sprinkler heads function according to manufacturer's data and give full coverage according to intent of Drawings. Replace any sprinklers not functioning as specified with ones that do, or otherwise correct system to provide satisfactory performance.

C. Continuity Testing: Test locating device and control wires for continuity prior to and after back-filling operations.

3.14 CLEAN-UP

- A. Remove debris resulting from work of this Section.**

3.15 ADJUSTMENTS AND MAINTENANCE

- A. Adjusting System:** Prior to acceptance, satisfactorily adjust and regulate entire system. Set watering schedule on controller appropriate to types of plants and season of year. Adjust remote control valves to operate sprinkler heads at optimum performance based on pressure and simultaneous demands through supply lines.
- B. System Layout:** Provide reduced prints of Record Document irrigation plans, laminated in four (4) mil. plastic, of size to fit controller door. Enlarge remote-control valve designations as necessary for legibility. Color-code areas covered by each station. Affix plans to inside of controller door.
- C. Instructions:** Upon completion of work, instruct maintenance personnel on operation and maintenance procedures for entire system.
- D. Flow Charts:** Record and prepare an accurate flow-rate chart for each automatic control valve.

3.16 RECORD DRAWINGS

- A. As specified in Section 01 3300, Submittal Procedures, and the following:**
1. Regularly update plans of the system and any changes made to the system throughout the project. Record all changes on this plan before trenches are back-filled.

**IRRIGATION
SECTION 32 8000
3595001**

2. Record complete as-built information and submit the Record Drawings to the Architect before applying for payment for work installed.
3. Show the following on the Record Drawings accurately to scale and dimensioned from two permanent points of reference:
 - a. and spares Distance of mainline from nearby hardscape.
 - b. Location of automatic control valves, quick couplers, and gate valves.
 - c. Location and size of all sleeves.
 - d. Location of automatic control wires.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Soil Preparation and Fertilization
 - 2. Planting
 - 3. Weed Control
 - 4. Mulch
 - 5. Clean-up
 - 6. Landscape Maintenance Period
- B. Work not included in this Section: Landscape elements such as concrete walks, fencing, outdoor lighting, rough grading, and clearing are not a part of this Section unless shown on the landscape Drawings.

1.2 RELATED REQUIREMENTS

- A. Section 31 0000, Earthwork.
- B. Section 32 8000, Irrigation

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CALGreen), edition as noted on the drawings, as adopted by the California Division of the State Architect (DSA).
- C. EPA - Federal Insecticide, Fungicide and Rodenticide Act.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Submittal Procedures:
 - 1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
 - 2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.

LANDSCAPING
SECTION 32 9000
3595001

- B. Pre-Installation Meeting: Request and hold a pre-installation meeting prior to beginning the work of this Section. Parties required to be in attendance are the Landscape Contractor, Project Inspector, Owner's Representative, and Landscape Architect.
- C. Pre-scheduled On-site Project Meetings: Hold regularly-scheduled (monthly or bimonthly as determined by the Landscape Architect) on-site project meetings with the Landscape Architect, Project Inspector and Owner's Representative. Dates and times will be jointly agreed upon.

1.5 ACTION SUBMITTALS

- A. Plant Material: Within fifteen (15) days after award of contract, locate plant materials required for construction. Ensure that trees and shrubs are contract- grown from a certified nursery. Notify Owner's Representative of plant material "tied off" for review at selected nursery. If specified material is not obtainable, submit the following to Owner's Representative: proof of non-availability, proposal for use of equivalent material, photographs of alternative choices of plant material. Include clear, written description of type, size, condition, and general character of plant material.
- B. Data Sheets:
 - 1. Provide product data for each type of landscape material indicated in the Drawings and Specifications.
 - 2. Letter from the manufacturer stating that the soil amendment material submitted for use on this project has no metal fragments or foreign objects.
- C. Samples: Submit samples of the following materials to Landscape Architect for approval:
 - 1. Soil amendment: (3) one-quart zip-locked plastic bags.
 - 2. Bark Mulch: (3) one-quart zip-locked plastic bags.
 - 3. Imported Topsoil: (3) one-quart zip-locked plastic bags.
- D. Provide soils analysis reports prepared by a qualified soils laboratory in accordance with the Soils Testing Requirements under "Soil Testing" in Article SOIL TESTING, in Part 3 of this section.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For landscape contractor.
- B. Prior to planting, submit copies of all trucking or packaging tags for all soil amendment, fertilizer and other additives to Landscape Architect so the quantities can be verified.
- C. Record of Pre-Installation Meeting.

1.7 CLOSEOUT SUBMITTALS

- A. Guarantee: Submit Subcontractor's guarantee.
- B. Record Drawings.

1.8 QUALITY ASSURANCE

- A. Qualifications: Work must be completed by a licensed Landscape Contractor. Provide proof of five years of continuous experience in landscaping and irrigation of projects of similar size (+/- 20% of the construction cost) and scope for education campuses. Landscape Contractor to have a minimum of two projects either completed or in construction in the last five years.
- B. Work Force: Ensure that an experienced foreman is present at all times during installation. Keep the same foreman and workers on the job from commencement to completion.
- C. Reviews: Specifically request reviews of all items listed below in Article INSPECTION REQUIREMENTS prior to progressing to the next level of work. The Owner's Representative reserves the right to inspect and reject material, both at place of growth and at site, before and/or after planting, for compliance with requirements for name, variety, size and quality.
- D. Reference Standards: Meet or exceed Federal, State and County laws requiring inspection of all plants and planting materials for plant disease and insect control.
- E. Plant Material:
 - 1. Conform to the current edition of Horticultural Standards for quality of Number 1 grade nursery stock as adopted by the American Association of Nurserymen. Conform to sizes specified on plant legend. Select plants which have a natural shape and appearance.
 - 2. Select only plants that are true to name, and tag one of each bundle or lot with the name of the plant in accordance with the standards of practice of the American Association of Nurserymen. In all cases, botanical names shall take precedence over common names.
 - 3. Tag each plant of a patented variety with the variety and identification number, where applicable, as it is delivered to the job site.
 - 4. Select only plants which have been nursery-grown in accordance with good horticultural practices and which have been grown under climatic conditions similar to those in the locality of the project for at least one year.
 - 5. Select only plants which are typical of their species or variety; have normal habits of growth; are sound, healthy, vigorous, well-branched and densely-foliated when in leaf; are free of disease, insect pests, eggs or larvae; and have a healthy and well-developed root system.

LANDSCAPING
SECTION 32 9000
3595001

6. Do not use plants that are severely pruned or headed-back to meet size requirements.
7. Do not plant container-grown plants that have cracked or broken balls of earth when taken from the container. Remove canned stock carefully from cans after containers have been cut on two sides with tin snips or other approved cutter.
8. At any time prior to final acceptance, be prepared to replace any plants that are rejected by the Owner's Representative because of physical damage to the plant.
9. Do not remove container-grown stock from containers before time of planting.
10. Furnish quantities necessary to complete the work as shown on the Drawings and, if necessary, make up for any discrepancies in the quantities given in the Plant List at no additional cost to Owner.

1.9 DELIVERY, STORAGE AND HANDLING

- A. Packaged Materials: Deliver packaged materials in original, unopened containers showing weight, certified analysis, name and address of manufacturer, and indication of conformance with state and federal laws if applicable.
- B. Coordinate a time for the Landscape Architect to inspect the plants upon their delivery to the project site.
- C. Bulk Materials:
 1. Do not dump or store bulk materials near structures, utilities, walkways or pavements, or on existing turf areas or plants.
 2. Provide erosion-control measures to prevent erosion or displacement of bulk materials, discharge of soil-bearing water runoff, and airborne dust reaching adjacent properties, water conveyance systems, or walkways.
 3. Accompany each delivery of bulk fertilizers and soil amendments with appropriate certificates.

1.10 FIELD CONDITIONS

- A. Planting Season Limits: Do not plant when grounds are wet or temperature is below 25° F. Do not proceed with any soil preparation and fertilization if all planting cannot be completed within Planting Season Limit.

1.11 INSPECTION REQUIREMENTS

- A. Landscape Architect reserves the right to examine and reject plant material both at place of growth and at site, before and after planting, for compliance with requirements of name, variety, size, and quality.

- B. Obtain verification from Project Inspector for the following at the appropriate times during construction and prior to further progression of work in this Section:
1. Rough grading is to tolerances specified in Section 31 0000 – Earthwork.
 2. The placement of landscape backfill material is as specified in this Section.
 3. Prior to the commencement of planting operations specified in this Section, the coverage and operation of the sprinkler irrigation system are as specified in Section 32 8000 - IRRIGATION.
 4. Required Test: For each load of soil amendment delivered to the site, spread at least two cubic yards (2 cy) of material onto a paved surface approximately two inches (2") deep. Pass a magnetic rake over the material in two directions. If any metal is found, test the entire load in the same manner. Perform all testing in the presence of the Project Inspector.
 5. Soil amendments, fertilizer, bark mulch and materials used for hydroseeding have been delivered to the site by the supplier, the invoices from the supplier indicate the project name and quantities delivered, and the Project Inspector has received copies of all such documents.
 6. Prior to planting, amendments and conditioners have been incorporated as per pre-planting recommendations, and planting areas have been made ready to receive planting.
- C. In case of failure to obtain any verification by the Project Inspector as required above, remove and replace work as necessary to obtain the verification at no additional cost to the Owner.

1.12 PROTECTION

- A. Provide protection for persons and property throughout progress of work. Use temporary barricades as required. Proceed with work in such manner as to minimize spread of dust and flying particles and to provide safe working conditions for personnel. Store materials and equipment where directed.
- B. Existing Construction: Execute work in an orderly and careful manner to protect paving, work of other trades, and other improvements.
- C. Existing Utilities: Provide protection for existing utilities within construction area. At no additional cost to Owner, repair any damages to utility lines that occur as a result of this work.
- D. Landscaping: Protect landscape work and materials from damage due to landscape operations, operations by other contractors and trades, and trespassers. Maintain protection during installation and maintenance periods.

**LANDSCAPING
SECTION 32 9000
3595001**

1.13 PLANTING SCHEDULE

- A. Install, establish, and maintain all lawn areas for a minimum of ninety (90) days prior to date of substantial completion. Coordinate schedule with other work and overall project schedule. Failure to install lawn areas by this date shall result in assessment of liquidated damages.
- B. Proceed with work in an orderly and timely manner to complete installation of landscaping within contract limits.

1.14 LANDSCAPE MAINTENANCE PERIOD REQUIREMENTS

- A. Beginning of Landscape Maintenance Period:
 - 1. General: Landscape Maintenance Period does not begin until all work is installed, as determined by Landscape Architect, in writing.
 - 2. On-site Inspection: When all work is complete, request and hold a meeting to include the Landscape Architect, Project Inspector, Architect and Owner's Representative who must together authorize and determine the start date for the landscape maintenance period. Coordinate and give notice of the date and time of the on-site meeting to all parties at least forty-eight (48) hours in advance.
 - 3. Acceptability: In cases where the lawn has reached adequate fullness and germination in some areas but not all, and authorization has not been given to begin the maintenance period, proceed with mowing, trimming, spraying, etc., as necessary prior to the beginning of the maintenance period.
- B. Duration of Landscape Maintenance Period:
 - 1. The Landscape Maintenance Period shall continue for a minimum of ninety (90) calendar days. During this time, continuously maintain all areas involved until final acceptance of the work by the Owner's Representative. See Landscape Maintenance Period procedure in Article LANDSCAPE MAINTENANCE, in Part 3 of this Section.

1.15 GUARANTEE

- A. The guarantee period for lawn and plant material shall be the duration of the landscape maintenance period, from commencement until final acceptance of the work of this Section.
- B. During the guarantee period, repair and/or replace plants and lawn not in satisfactory growing condition, as determined by Owner's Representative, without additional cost to Owner. Plants are to be replaced in accordance with Article LANDSCAPE MAINTENANCE in Part 3 of this Section, using plants of the same kind and size specified in plant list.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Use material in new and perfect condition as specified. Any deviations or substitutions from the Specification and Drawings must first be approved by Owner's Representative in writing prior to use.

2.2 SOIL PREPARATION MATERIALS

- A. Topsoil: Fertile; friable; natural loam surface soil; reasonably free of subsoil, clay lumps, brush, weeds and other litter; and free of roots, stumps, stones/rocks, and other extraneous or toxic matter harmful to plant growth.
- B. Soil Amendment: One-percent nitrogen-impregnated bark product with a ninety-percent (90%) bark base and zero to one-quarter inch (0-1/4") particle size, or approved equivalent. Do not spread until testing requirements have been satisfied.
- C. Fertilizer/Soil Conditioner: Gro-Power Plus or approved equal.
- D. Fertilizer for Trees: Seven-gram Gro-Power Planting Tablets (12-8-8 NPK) or approved equal.
- E. Vitamin B-1: "Superthrive", "Liquinox Start", "Cal-Liquid", or approved equal.

2.3 MISCELLANEOUS LANDSCAPE MATERIALS

- A. Bark Mulch: Untreated, shredded cedar.
- B. Tree-staking System: As indicated on Drawings.
- C. Pre-Emergent Weed Control: Oxadiazon, "Treeflan", "Ronstar 2G", "Surflan" (Elano Products Company), or approved equal.

2.4 PLANT MATERIAL:

- A. Nursery Plant Stock:
 - 1. As indicated on Drawings. Do not remove container-grown stock from containers until planting time. Plants shall be true to name.
 - 2. Healthy, shapely, well-rooted, not pot-bound, free from insect pests or plant diseases and properly "hardened off" before planting. Replace plants that are not alive or are not in satisfactory growing condition, as determined by the Landscape Architect, without additional cost to Owner. The Landscape Architect may reject plants before and/or after planting.

PART 3 - EXECUTION

3.1 SITE CONDITIONS

- A. Examine the site, verify grade elevations, and observe conditions under which work is to be performed. Do not proceed with work until unsatisfactory conditions have been corrected in a manner acceptable to the Owner's Representative.
- B. Proceed with complete landscape work as rapidly as portions of the site become available, working within seasonal limitations for each kind of landscape work required.
- C. Determine location of underground utilities and perform work in a manner which will avoid possible damage. Hand-excavate, as required, to minimize possibility of damage to underground utilities. Maintain grade stakes set by others until removal is mutually agreed upon by parties concerned.
- D. When conditions detrimental to sod or plant growth are encountered, such as rubble fill, adverse drainage condition, or other obstructions, notify the Owner's Representative before planting.

3.2 SOIL TESTING

- A. Coordinate soil testing in an expeditious and timely manner as required for on-site topsoil materials. Contract with a soil laboratory and include cost of sampling and testing in contract price. Take one (1) sample for every 5,000 square feet of landscape area up to a maximum of six (6) samples under the direction of and in the presence of the Owner's Representative.
- B. Submit each sample, according to the quantity of soil required by testing laboratory, to a competent laboratory approved by the Owner's Representative.
- C. Provide analysis of soil samples for pH, salinity, ammonia, phosphate, potassium, calcium, magnesium, boron, and sodium levels. Provide appraisal of chemical properties, including particle size determination, and recommendations for types and quantities of amendments and fertilizers.

3.3 PREPARATION

- A. Clearing of Vegetation:
 - 1. If live perennial weeds exist on site at the beginning of work, spray with a non-selective systemic contact herbicide as recommended and applied by an approved licensed landscape pest control advisor and applicator. Leave sprayed plants intact for at least 15 days.
 - 2. Clear and remove existing weeds by mowing or grubbing off all plant parts at least one-quarter inch ($\frac{1}{4}$ ") inch below surface of soil over entire areas to be planted.

B. Soil preparation:

1. Loosen soil in all planting areas, and on slopes flatter than 3:1 gradient, to a depth of six to eight inches (6" - 8") below finish grade. All debris, foreign matter, and stones shall be removed prior to the placing of any fertilizers or conditioners. Soil preparation is for all shrub planting beds, lawn hydroseeded areas and sodded lawn areas.
2. Conduct the required soil tests and instruct the lab to include a minimum of the following soil improvements in the recommendation on the soils report.
 - a. Soil Amendment: Two cubic yards (2 cy) per 1,000 square feet.
 - b. Gro-Power Plus: One hundred fifty pounds (150 lbs) per 1,000 square feet.
 - c. If the lab recommends less than six cubic yards (6 cy) of soil amendment, the excess bid amount shall be applied to the cost of any additional recommended soil improvements, or returned to the Owner as a credit
3. Apply amendments as follows, using rates recommended by the soils testing laboratory (the rates of amendments shown below are for bidding purposes only):
 - a. Fertilizer/Soil Conditioner: Broadcast 150 pounds of Gro Power Plus per 1,000 square feet in all planting areas and rototill to a depth of six to eight inches (6" - 8"). Remove from the site any rock and debris brought to the surface by cultivations. "Cultipack" all areas to receive sod or hydroseed.
 - b. Apply soil amendment to all planting areas at the rate of six cubic yards (6 cy) per 1,000 sf and rototill into the top six to eight inches (6" - 8").
4. Upon completion of finish grading, request an review and obtain approval of Landscape Architect prior to commencement of planting or hydroseeding.

C. Finish Grading for all Planting areas

1. Refer to Earthwork Specification Section for Rough Grading.
2. Grade to elevations and contours shown on Drawings. Fill low spots with landscape backfill material and grade to surface drain in manner indicated on Drawings.
3. Finish-grade so that the entire area within the contract lines has a natural and pleasing appearance as specified and as directed by Landscape Architect.
4. Adjust sprinkler heads flush to finish grade in preparation to receive hydroseeding or one-half inch above finish grade in preparation to receive sod. Reset sprinkler heads flush to grade after turf has germinated.
5. Flag the sprinkler heads and valve markers.

D. Planting Pits for Trees:

1. Excavate pits with vertical sides and with bottom of excavation slightly raised at center to provide proper drainage.

LANDSCAPING
SECTION 32 9000
3595001

2. Set container-grown stock in center of pit on earth pedestal. Separate roots and/or prune roots as directed by Landscape Architect. In hot weather, pre-wet pit. Loosen outside roots from sides and bottom of root ball. When set, place additional backfill around base and sides of root ball. Work each layer to settle backfill and eliminate voids and air pockets. Water after placing final layer of backfill.
3. Loosen hard subsoil in bottom of excavation. Extend excavation as required to insure proper drainage from plant pits.
4. Fill excavated planting pits with water to half the depth of pit. Pits should drain within four hours (4 hrs). If planting pits do not drain, notify Project Inspector immediately. Do not proceed with planting until Landscape Architect has resolved a method to provide drainage.

3.4 PLANTING

A. Trees:

1. Lay out individual trees locations and areas for multiple plantings. Stake the locations, outline the areas, and secure the Owner's Representative's acceptance before beginning the planting work. Make minor adjustments as requested.
2. Scarify root ball prior to planting. Plant in holes twice the diameter of the root ball and to a depth equal to the container's height. Place the shrub and/or groundcover so the top of the root ball is one inch (1") higher than the surrounding grade. Set container-grown stock in center of pit. In hot weather, pre-wet the pit. When set, place additional backfill around base and sides of root ball. Work each layer to settle backfill and eliminate voids and air pockets. Thoroughly compact lower half of backfill in plant pit. See staking or guying detail. Water after planting. Provide a berm or watering basin for each tree. Add Vitamin B-1, in the proper solution as recommended by the manufacturer, to the second watering of the basin.
3. Place fertilizer planting tablets in root zone and alongside each plant. Follow manufacturer's instructions for number of tablets to use for each container size.
4. See Drawings for additional information.
5. Grooming and Staking of Trees:
 - a. Prune, thin-out and shape trees in accordance with standard horticultural practice. Prune trees to retain required height and spread. Unless otherwise directed by Landscape Architect, do not cut tree leaders, and remove only injured or dead branches from flowering trees.
 - b. Paint cuts over one-half inch ($\frac{1}{2}$ ") in size with standard tree paint or compound, covering exposed, living tissue. Use paint that is waterproof, antiseptic, adhesive, elastic and free of kerosene, coal tar, creosote, and other substances harmful to plants. Do not use shellac.
 - c. Stake or guy trees immediately after planting, as indicated on Drawings.

- B. Request review by the Landscape Architect after locating, but prior to planting all trees. Under the direction of the Landscape Architect, make slight adjustments to plant material location as necessary to reflect original intention of Drawings.

3.5 WEED CONTROL

- A. Apply pre-emergent weed control to all planting areas (except lawn) after completion of all planting and one complete watering. Follow manufacturer's directions. To prevent washing away of weed control, do not over-water after its application. Do not allow any weed control into lawn areas. Treat any existing noxious weeds, such as Johnson grass, with Roundup in successive treatments until all roots are destroyed, then remove all grass and roots. Notify Owner's Representative of time of installation for verification of application.

3.6 BARK MULCH

- A. Apply mulch at the rate of three inches (3") deep to all planting areas, exclusive of lawn, after the planting and weed control are completed. Twelve inches (12") from planter edges, taper full depth of mulch to meet adjacent grades. Do not place mulch within three inches (3") of trunk or stems.

3.7 CLEAN-UP

- A. During construction, keep the site free of rubbish and debris, and clean up the site promptly when notified to do so. Take care to prevent spillage on streets from hauling and immediately clean up any such spillage and/or debris deposited on streets due to the work of this Section.
- B. During all phases of the construction work, take all precautions to abate dust nuisance by clean-up, sweeping, sprinkling with water, or other means as necessary.
- C. Paving: Maintain cleanliness of paving areas and other public areas used by equipment, and immediately remove spillage; remove rubbish, debris, and other material resulting from landscaping work, leaving site in a safe and clean condition.

3.8 LANDSCAPE MAINTENANCE

- A. The Landscape Maintenance Period will begin when all the Landscape Maintenance Period Requirements have been met (See Part 1 of these Specifications).
- B. Cleaning: Maintain cleanliness on paving areas and other public areas used by equipment and immediately remove all spillage. Remove from project site all rubbish and debris found thereon and all material and debris resulting from landscaping work, leaving the site in a safe and clean condition.

**LANDSCAPING
SECTION 32 9000
3595001**

C. Maintenance:

1. Sprinkler Irrigation System:

- a. Check system weekly for proper operation. Flush lateral lines out after removing last sprinkler head or two at each end of lateral. Adjust all heads as necessary for unimpeded coverage.
- b. Set and program automatic controllers for seasonal water requirements. Provide the Owner's Representative with keys to the controllers and instructions on how to turn off system in case of emergency.
- c. Repair all damages to sprinkler irrigation system as part of the contract work. Make repairs within one watering period or one week, whichever is the least amount of time.

2. Trees:

- a. Water enough that moisture penetrates throughout root zone and only as frequently as necessary to maintain healthy growth.
- b. Construct and/or remove water basins around each plant, depending on the time of the year and as directed.
- c. Do not prune unless directed by the Landscape Architect.
- d. Replace any dead, dying or vandalized plant material on a weekly basis throughout the Landscape Maintenance Period.

3. Insecticide and Herbicide Application:

- a. If needed, control weeds with selective herbicides and sprays. In areas where crabgrass has infested the lawn, apply pre-emergent herbicides such as Dacthal by Amvac, Balan, or Betasan by Gowan for control prior to crabgrass germination. Control insect pests if necessary.
- b. Use only a licensed Pest Control Operator to apply herbicides and sprays and to maintain a log for applications indicating material, timing, and rate.

D. Final Acceptance of the Landscape Maintenance Period: request on-site meeting forty-eight hours (48 hrs.) in advance with the Landscape Architect and Owner's Representative to determine the end of the Landscape Maintenance Period.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Domestic water piping system.
 - 2. Fire protection piping systems.
 - 3. Sewer piping system

1.2 RELATED REQUIREMENTS

- A. Section 01 5000, Temporary Facilities and Controls.
- B. Section 01 6116, Volatile Organic Compound (VOC) Restrictions, for VOC limits pertaining to adhesives, sealants, fillers, primers, and coatings.
- C. Section 01 8113, Sustainable Design Requirements, for CAL-Green [and Collaborative for High Performance Schools (CHPS)] general requirements and procedures.
- D. Section 31 0000, Earthwork.
- E. Section 31 2333, Trenching and Backfilling.
- F. Section 32 1600, Site Concrete.

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CAL Green), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- C. California Plumbing Code, (CPC), edition as noted on the Drawings.
- D. California State Health and Safety Code Section 116875, Lead Free Public Water Systems.
- E. Local Jurisdiction: Any work within the street, highway or right-of-way shall be performed in accordance with the requirement of the governmental agencies having jurisdiction, and shall not begin until all of those governing authorities have been notified.
- F. ASTM International (ASTM):
 - 1. D422-63: Test Method for Particle Size Analysis of Soil.
 - 2. D698-00: Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures, Using 5.5 lb (2.49 Kg) Rammer and 12 inch (304.8 mm) Drop.

3. D1556-00: Test Method for Density of Soil in Place by the Sand-Cone Method.
4. D1557-02: Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 10 lb. (4.54 Kg) Rammer and 18 inch (457 mm) Drop.
5. D3017-05: Test Methods for Moisture Content of Soils and Soil-Aggregate Mixture by Nuclear Methods (Shallow Depth).
6. D4318-05: Test Method for Liquid Limit, Plastic Limit, and Plasticity Limit.

G. CALTRANS Standard Specifications.

H. CAL-OSHA, Title 8, Section 1590 (e).

I. NFPA 13, 24 and 25, per CFC chapter 80 and CBC chapter 35.

1.4 ADMINISTRATIVE REQUIREMENTS

A. Submittal Procedures:

1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
3. Sustainable Design Submittals shall comply with the additional requirements of Section 01 8113, Sustainable Design Requirements.

1.5 ACTION SUBMITTALS

- A. Provide supplier's descriptive literature for all products to demonstrate compliance with specified attributes.
- B. Substitution: Provide all data of proposed material being submitted as a substitution. Provide comparison with specified product data and identify all differences. Failure to provide comparison will be reason for rejection.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For contractor / installer.
- B. Provide sieve analysis from accredited testing lab on pipe bedding material. Analysis shall have a current date not older than project contract signing date.
- C. Sustainable Design:
1. General:
 - a. Submit information necessary to establish and document compliance with the California Green Building Standards Code.
 - b. Sustainable design submittals are in addition to other submittals.
 2. The following information shall be provided:
 - a. Adhesives and Sealants: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.

- b. Paints and Coatings: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.

1.7 CLOSEOUT SUBMITTALS

- A. Guarantee: Submit subcontractor's guarantee.
- B. Water Sterilization Test Report.

1.8 QUALITY ASSURANCE

- A. Contractor / Installer shall have been in business for five (5) years providing/finishing similar size projects and complexity.
- B. Contractor shall be solely responsible for all subgrades built. Any repairs resulting from inadequate compaction or incorrect grades will be the responsibility of the contractor.
- C. The representatives of the Owner's testing lab will not act as supervisor of construction, nor will they direct construction operations. Neither the presence of the Owner's testing lab representatives nor the testing by the Owner's testing lab shall excuse the contractors or subcontractors for defects or deficiencies discovered in their work during or following completion of the project. Correcting inadequate compaction is the sole responsibility of the contractor.
- D. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the drawings to be salvaged and re-used.
 - 1. Sun damaged or discolored PVC pipe will be rejected.
- E. All materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.

1.9 FEES, PERMITS, AND UTILITY SERVICES

- A. Obtain and pay for permits and service charges required for installation of Work. Arrange for required inspections and secure written approvals from authorities having jurisdiction.
- B. Upon completion of work within right-of-way, provide copies of written final approval to the Architect.

1.10 DELIVERY, STORAGE AND HANDLING

- A. Transport, store and handle in strict accord with the local jurisdiction and manufacturer's written recommendations
- B. Deliver undamaged products to job in manufacturer's sealed containers and/or original bundles with tags and labels intact.

1.11 EXISTING SITE CONDITIONS

- A. Contractor shall acquaint himself with all site conditions. If unknown active utilities are encountered during work, notify Architect promptly for instructions. Failure to notify will make Contractor liable for damage to these utilities arising from Contractor's operations subsequent to discovery of such unknown active utilities.
- B. Existing civil, mechanical and electrical improvements are shown on respective site plans to the extent known. Should the Contractor encounter any deviation between actual conditions and those shown, he is to immediately notify the Architect before continuing work.

1.12 PROTECTION

- A. Adequate protection measures shall be provided to protect workmen and passers-by on and off the site. Adjacent property shall be fully protected throughout the operations. Blasting will not be permitted. Prevent damage to adjoining improvements and properties both above and below grade. Restore such improvements to original condition should damage occur. Replace trees and shrubs outside building area disturbed by operations.
- B. In accordance with generally accepted construction practices, the Contractor shall be solely and completely responsible for working conditions at the job site, including safety of all persons and property during performance of the work. This requirement shall apply continuously and shall not be limited to normal working hours.
- C. Any construction review of the Contractor's performance conducted by the Geotechnical Engineer is not intended to include review of the adequacy of the Contractor's safety measures, in, on, or near the construction site.
- D. Provide shoring, sheeting, sheet piles and or bracing to prevent caving, erosion or gulying of sides of excavation.
- E. Surface Drainage: Provide for surface drainage during period of construction in manner to avoid creating nuisance to adjacent areas. The contractor shall make a reasonable effort on a daily basis to provide pumps and all equipment necessary to keep all excavations and the site free from water during entire progress of work, regardless of cause, source, or nature of water.
- F. Adjacent streets and sidewalks shall be kept free of mud, dirt or similar nuisances resulting from earthwork operations.
- G. The site and adjacent influenced areas shall be watered as required to suppress dust nuisance. Dust control measures shall be in accordance with the local jurisdiction.
- H. Trees: Carefully protect existing trees that are to remain. Provide temporary irrigation as necessary to maintain health of trees.

1.13 SEASONAL LIMITS

- A. No fill material shall be placed, spread or rolled during unfavorable weather conditions. When work is interrupted by rains, fill operations shall not be resumed until field tests indicate that moisture content and density of fill are satisfactory.

1.14 RECORD DRAWINGS

- A. Keep a daily record of all pipe placed in ground, verified by Project Inspector.
- B. Upon completion of this Contract, furnish one tracing showing all outside utility lines, piping, etc., installed under this Contract. Locate and dimension all work with reference to permanent landmarks.
- C. All symbols and designations used in preparing "RECORD" drawings shall match those used in Contract drawings.
- D. Properly identify on as-builts and provide dimensions for all stubs for future connections. Provide concrete markers 6" dia. 12" deep, flush with finish grade at the ends of all stubbed pipes.
- E. Provide record drawings per Section 01 3300.

PART 2 - PRODUCTS

2.1 DESIGN AND PERFORMANCE CRITERIA

- A. Sustainable Design:
 - 1. VOC emissions for field-applied adhesives, sealants, and sealant primers must comply with limits specified in Section 01 6116.
 - 2. VOC emissions for field-applied paints and coatings must comply with limits specified in Section 01 6116.

2.2 MATERIALS - GENERAL

- A. Provide each item listed herein or shown on drawings of quality noted or approved equal. All material shall be new, full weight, standard in all respects and in first-class condition. Insofar as possible, all materials used shall be of same brand or manufacture throughout for each class of material or equipment. Materials shall be of domestic manufacture and shall be tested within Continental United States.
- B. Grade or quality of materials desired is indicated by trade names or catalog numbers stated herein.
- C. Dimensions, sizes, and capacities shown are minimum and shall not be changed without permission of Architect.
- D. All materials in this section used for any public water system or domestic water for human consumption shall be lead free.

1. For the purposes of this section, "lead free" means not more than 0.2 percent lead when used with respect to solder and flux and not more than 8 percent when used with respect to pipes and pipe fittings.
2. All pipe, pipe or plumbing fitting or fixtures, solder, or flux shall be certified by an independent American National Standards Institute (ANSI) accredited third party, including, but not limited to, NSF International, as being in compliance with this section.

E. All materials used for fire system piping shall be UL and FM approved.

2.3 VALVE BOXES

- A. Provide at each valve or cock in ground a Christy, Brooks, or equal to Christy G05CT, concrete valve box with cover marked for service, domestic water shall be marked "Water" and fire supply shall be marked "Fire". Furnish extension handles for each size square nut valve, and provide "fork" handle for each size of "wheel handle" valve as required. Do not locate valve boxes in walk, or covered passages, curbs, or curb & gutters, unless necessary. If valve location is within concrete or asphalt paved surface valve box shall be as detailed on plans for such condition. Provide valve box extensions as required to set bottom of valve box to bottom of piping in which valve is installed. Provide Owner with set of special wrenches and/or tools as required for operation of valves.

2.4 PIPES AND FITTINGS

- A. Sanitary Sewer: PVC sewer pipe and fittings with Ring-Tite joints, ASTM D3034 SDR35.
- B. Domestic water Lines 3 1/2" and smaller: Type K copper tubing, hard temper, with wrought copper fittings. Schedule 80 PVC, ASTM D 1784, ASTM D 1785.
- C. Water lines 4" and larger: AWWA C-900 Class 150/DR18 with rubber gasket joints.
- D. Fire lines 4" and larger: AWWA C-900 Class 200/DR14 with rubber gasket joints.
- E. Solder: Lead Free. 95/5; 95% Tin / 5% Antimony.
- F. Ductile Iron Pipe; AWWA Class 51, Cement Lined
- G. Ductile Iron Pipe Fittings; AWWA C110, C153, Ebba Iron, Star Romac, Sigma, or approved equal.
- H. PVC Mechanical Fittings; Ebba Iron, Star; Romac; Sigma or approved equal.
- I. Ductile Iron Pipe/PVC C-900 Pipe Restrained Fittings; Ebba Iron # 3800 Mega Coupling, Ebba Iron 1100CH Split Restrained Harness for pipe couplings. StarGrip Series 4000.
- J. Ductile Iron Pipe/PVC C900, C905 Restrained Degreedand Blind Cap Fittings,;
- K. Mega Lug; Sigma; Romac; or an approved equal

- L. Mechanical Fitting Bolts; Bolts and nuts shall be carbon steel with a minimum 60,000 psi tensile strength conforming to ASTM A 307, Grade A. Bolts shall be standard ANSI B1.1 Class 2A course threads. Nuts shall conform to ASTM A 563 and be standard ANSI B1.1, Class 2A course thread. All bolts and nuts shall be zinc coated.
- M. Fasteners Anti-Rust Coatings; After assembly, coat all fasteners with an Asphaltic Bituminous coatings conforming to latest edition NFPA 24.
- N. Ductile Iron Pipe Wrap; 8 mil polyethylene pipe wrap conforming to ANSI/AWWA C105/A21.5 standards.
- O. Pipe Insulation; Pipe exposed to atmospheric conditions ½" thru 4" NPT; Johns Manville rigid fiberglass insulation, Micro Lok HP; Owens Corning Fiberglas SSL II; Conforming to ASTM C 612, Type 1A or type 1B.
- P. Aluminum field applied pipe insulation jacket; comply with ASTM B209, ASTM C1729, ASTM C1371 Manufacturers; Childers Metals; ITW Insulation Systems Aluminum Jacketing; or an approved equal.
 - 1. Finish shall be flat mill finish
 - 2. Factory Fabricated Fitting Covers; 45 and 90 degree elbows, tee's, valve covers, end caps, unions, shall be of the same thickness and finish of jacket.
 - 3. The fittings shall be composed of 2-pieces
 - 4. Adhesives; per the manufacturers requirements
 - 5. Joint Sealant; shall be silicone, and shall be aluminum in color.
- Q. Sewer Forced Main; HDPE, DR 11, color gray with green stripe by JM Eagle or approved equal.

2.5 SANITARY SEWER MANHOLES

- A. Shall be constructed as shown on plan details.

2.6 CLEANOUTS

- A. Cleanouts of same diameter as pipe up to 8" in size shall be installed in all horizontal soil and waste lines where indicated and at all points of change in direction. Cleanouts shall be located not less than 18" from building so as to provide sufficient space for rodding. No horizontal run over 100 feet shall be without cleanout whether shown on drawings or not.
- B. All cleanout boxes shall be traffic rated with labeled lid, Christy G05CT or approved equal. Lid shall be vandal proof with stainless steel screws

2.7 UNIONS

- A. Furnish and install one union at each threaded or soldered connection to equipment and 2 unions, one on each side of valves on pipes ½" to 3".

- B. Locate unions so that piping can be easily disconnected for removal of equipment or valve. Provide type specified in following schedule:

Type of Pipe Union

Steel Pipe: 150 lb. Screwed malleable ground joint, brass, brass-to-iron seat, black or galvanized to match pipe.

Copper tubing: Brass ground joint with sweat connections.

PVC Sch 80 pipe: PVC union, FIPT X FIPT

2.8 VALVES

- A. Provide valves as shown and other valves necessary to segregate branches or units. Furnish valves suitable for service intended. Valves shall be properly packed and lubricated. Valves shall be non-rising stem. Place unions adjacent to each threaded or sweat fitting valve. Install valves with bonnets vertical. All valves shall be lead free.
- B. Valves ½" thru 2"; shall be made of bronze, full size of pipe and lead free. Nibco S-113-FL Series; American G-300 Series; Matco 511 FL Series; Apollo 102T-FL Series. Brass valves of brass parts within valves will not be accepted.
- C. Valves, 2 ½" thru 3" shall be class 150; Shall be made of bronze, full size of pipe; Jenkins Fig. 2310 J; Lunkinheimer Fig. 2153; Crane Fig. 437; Stockham Fig. B-128.
- D. Valves, Flanged; 4" thru 12" Ductile Iron Resilient Wedge Gate Valve; Nibco F 609 RW; American 2500 Series; Kennedy 8561; Mueller 2360 Series.

2.9 TAPPING SLEEVE

- A. Shall be used on pipe sizes 6" thru 12" and shall be made with stainless steel material including stainless steel bolts. Flanges shall be ductile iron or high carbon steel. Gaskets shall seal full circumference of pipe. Shall be manufactured for operating pressure of 200 psi, and shall pass test pressure of 300 psi. Romac SST series; Smithblair 662; Mueller H304; Ford "FAST" tapping sleeve.

2.10 SERVICE SADDLES

- A. Shall be used on pipe size 2" thru 4". Body shall be made from ductile iron with epoxy coating or bronze. Cascade Style CSC-1; A.Y. McDonald model 3891 AWWA/3892 FNPT; Smith-Blair #317; Ford S70, S71, S90, (style B).

2.11 TRACER WIRE

- A. No. 10 THW solid copper wire. Solder all joints

PART 3 - EXECUTION

3.1 DRAWINGS AND COORDINATION

- A. General arrangement and location of piping, etc., are shown on Drawings or herein specified. Install work in accord therewith, except for minor changes that may be necessary on account of other work or existing conditions. Before excavation, carefully examine other work that may conflict with this work. Install this work in harmony with other craft and at proper time to avoid delay of work.
- B. Verify invert elevations at points of connection to existing systems prior to any excavation. If invert elevations differ from that shown on drawings, notify Architect immediately.
- C. In advance of construction, work out minor changes if conflicts occur with electrical or mechanical. Relocate services to suit actual conditions and work of other trades to avoid conflict therewith. Any adjustments or additional fittings to make adjustments shall not be cause for additional costs to the owner.
- D. Execute any work or apparatus shown on drawings and not mentioned in specifications, or vice versa. Omission from Drawings or Specifications of any minor details of construction, installation, materials, or essential specialties does not relieve Contractor of furnishing same in place complete.
- E. Graded pipes shall take precedence. If conflict should occur while placing the domestic water and fire service piping, the contractor shall provide any and all fittings necessary to route the water lines over such conflicting pipes at no additional costs to the owner.

3.2 ACCESS

- A. Continuously check for clearance and accessibility of equipment or materials specified herein to be placed. No allowance of any kind shall be made for negligence on part of Contractor to foresee means of installing his equipment or materials into proper position.

3.3 EXCAVATING AND BACKFILLING

- A. Excavation and Bedding:
 - 1. General: Trench straight and true to line and grade with bottom smooth and free of irregularities or rock points. Trench width to be a minimum of 12" wider than outside diameter of pipe. Follow manufacturer's recommendations for use of each kind and type of pipe.
 - 2. Bedding: Provide a bedding as noted on drawing details for the full length of the pipe. Bedding shall have a minimum thickness beneath the pipe of 4" or 1/8 the outside diameter of the pipe, which ever is greater. Provide bell holes and depressions for pipe joints only of size required to properly make joint.
 - 3. If the trenches for the site utilities falls within areas to be lime treated, the piping shall be installed prior to any lime treatment operations, providing the elevation of the piping is below the treatment section.

UTILITIES
SECTION 33 0000
3595001

- a. If trenching is necessary in areas that have been previously lime treated the contractor shall backfill the trench with class 2 aggregate base, with minimum section equal to the lime treated section and compacted to 95%.

B. Laying of Pipe:

- 1. General: Inspect pipe prior to placing. Sun damaged pipe will be rejected. Set aside any defective or damaged material. Do not place pipe in water nor place pipe when trenches or weather are unsuitable. Lay pipe bell up grade, true to line and grade.
 - a. Sewer pipe shall be laid in strict conformity to the prescribed line and grade, with grade bars set and each pipe length checked to the grade line. Three consecutive points on the same rate of slope shall be used at all times to detect any variation from a straight grade. In any case of discrepancy, work shall be stopped and the discrepancy immediately reported to the Owner's Representatives. In addition, when requested by the Owner's Representative, a string line shall be used in the bottom of the trench to insure a straight alignment of the sewer pipe between manholes. The maximum deviation from grade shall not be in excess of 1/4 inch. In returning the pipe to grade, no more than 1/4" depression shall result.
 - b. The Contractor shall expose the end of existing pipe to be extended, for verification of alignment and elevation, prior to trenching for any pipe which may be affected. All costs of such excavation and backfill shall be included in the price paid for the various items of work.
 - c. A temporary plug, mechanical type shall be installed on sewer pipe at the point of connection to existing facilities. If connecting to a public facility the plug shall conform to the requirements of the local jurisdiction. This plug shall remain in place until the completion of the balling and flushing operation.
- 2. Bell and Spigot Joints: Lubricate inside of bells and outside of spigots with soap solution. Wedge joints tight. Bell of bell and spigot pipe to be pointed up grade.

C. Backfilling:

- 1. General: Do not start backfill operations until required testing has been accomplished.
- 2. Compaction and Grading: Remainder of backfill shall be in accordance with Section 31 2333 – TRENCHING AND BACKFILLING.
- 3. If trenching in area previously lime or cement treated backfill top of trench section, same depth as lime or cement treatment with Class 2 Aggregate Base compacted to 95% minimum relative compaction.

3.4 INSTALLATION OF WATER PIPING

- A. Immediately cap or plug ends of, and opening in, pipe and fittings to exclude dirt until final connections made. Use reducing fittings where any change in pipe size occurs. Bushings shall not be used.

- B. General: Should existing conditions or other work prevent the running of pipes or the setting of equipment at the points indicated by drawings, changes as authorized by the Architect shall be made without additional cost to the Owner.
- C. All bolts used on mechanical fittings shall be thoroughly coated with an asphaltic bituminous coating conforming to 2007 NFPA (National Fire Protection Association) 10.3.5.2 and 10.8.3.5, CBC chapter 35 and CFC chapter 80.
- D. All buried metal shall be incased with 8 mil polyethylene wrap so that no soil is in contact with metal. Ends of polyethylene wrap shall be taped to provide seal with pipe.
- E. Do not install water lines in same trench with non-metallic sewer lines unless bottom of water pipe at all points is at least 12" above top of sewer line and water line is placed on solid shelf excavated at one side of common trench with a minimum of 12 inch horizontal separation.
- F. Under no circumstance shall a fitting be located directly under a structural footing without prior approval from the Architect.
- G. In locations where existing domestic pipe is rerouted, the new pipe shall be assembled using restrained fittings at all joints including factory pipe joints. Tapped restrained blind flanges shall be temporarily installed at each end of the assembled pipes until testing and chlorination is completed and approved.

3.5 CLOSING IN OF UNINSPECTED WORK

- A. Do not allow or cause work installed to be covered up or enclosed before it has been inspected, tested, and approved. Should work be enclosed or covered up before it has been approved, uncover work at own expense. After it has been inspected, tested and approved, make repairs necessary to restore work of other contractors to condition in which it was found at time of cutting.

3.6 CARE AND CLEANING

- A. Repair or replace broken, damaged, or otherwise defective parts, materials, and work. Leave entire work in new condition satisfactory to Architect. At completion, carefully clean and adjust equipment, fixtures and trim that are installed as part of this work. Leave systems and equipment in satisfactory new operating condition.
- B. Drain and flush piping to remove grease and foreign matter.
- C. Sewer piping shall be balled and flushed.
- D. Clean out and remove surplus materials and debris resulting from the work, including surplus excavated material.
- E. Flush fire service piping in the presence of the project inspector. Flushing shall be continued for a sufficient time as necessary to ensure all foreign material has been removed. Flow rate shall be equal to site fire flow requirements.

3.7 SEWER INTERNAL INSPECTIONS

- A. Upon completion of construction and prior to final inspection, the Contractor shall clean the entire new pipeline of all dirt and debris. Any dirt or debris in previously existing pipes or ditches in the area, which resulted from the new installation, shall also be removed. Pipes shall be cleaned by the controlled balling and flushing method. Temporary plugs shall be installed and maintained during cleaning operations at points of connection to existing facilities to prevent water, dirt, and debris from entering the existing facility.

3.8 TEST OF PIPING

- A. Pressure Test piping at completion of roughing-in, in accord with following schedule, and show no loss in pressure or visible leaks after minimum duration or four (4) hours at test pressures indicated.
- B. Chlorination tests shall be performed after all fixtures and any required mechanical devices are installed and the entire system is complete and closed up.
- C. In cases where new domestic water piping is assembled for re-routing of existing domestic water pipe, the contractor shall perform the following testing prior to connecting the new water pipe to the existing system.
 - 1. The pipe shall be pressure tested and per the test schedule.
 - 2. The pipe shall be pressure tested down within the trench.
 - 3. The contractor shall dig a temporary ditch below the existing pipe to drain to a sump that is lower than the bottom of the trench and to the side of the trench. The sump shall be 30% larger than the total volume of water within the testing pipe assembly.
 - 4. After pressure testing and chlorination has taken place and accepted, the contractor shall drain the pipe into the sump and pump the sump out as it is filling.
 - 5. The temporary test fittings at each end of the pipe assembly shall be removed and the final restrained couplings installed.
 - 6. The existing piping shall be cut and the water within the pipe shall drain below the pipe to the temporary sump. Pump the sump as it is being filled up. Take extreme caution not to contaminate the existing pipe with any contaminants within the trench.
 - 7. Before making the final coupling connections, the restrained couplings at each end of the new pipe shall be thoroughly swabbed inside the fitting with a solution of chlorine mixed with water at a rate of 1 part chlorine to 4 parts potable water.
 - 8. After final connections are made, a visual inspection shall be made after fittings are wiped off. If after 1 hr, no noticeable drips are noted the pipe can be backfilled.
 - 9. The contractor shall flush all water piping affected by chlorination until it is within acceptable levels approved by certified testing lab.

TEST SCHEDULE

<u>System Tested</u>	<u>Test Pressure PSIG Test With</u>
Public Water Mains	Per local jurisdiction requirements.
Private Domestic Water Piping:	150 Lbs. Water 4 hrs.
Fire Protection Piping:	200 Lbs. Water pressure, 4 hrs duration with no pressure loss.
Sanitary Sewer Piping:	Sewer system shall be tested for leakage per local jurisdiction requirements.

- D. Testing equipment, materials, and labor shall be furnished by contractor.

3.9 WATER SYSTEM STERILIZATION

- A. Public Water Mains: Shall be flushed and disinfected per the local jurisdiction requirements
- B. Clean and disinfect all site water systems connected to the domestic water systems in accordance with AWWA Standard C651 and as required by the local Building and Health Department Codes, and EPA.
 - 1. Clean and disinfect industrial water system in addition to the domestic water system.
 - 2. Disinfect existing piping systems as required to provide continuous disinfection upstream to existing valves. At Contractors option, valves may be provided to isolate the existing piping system from the new piping system.
- C. Domestic water sterilization shall be performed by a licensed "qualified applicator" as required by CAL-EPA Pesticide Enforcement Branch for disinfecting and sterilizing drinking water.
- D. Disinfecting Agent: Chlorine product that is a registered product with Cal-EPA for use in California potable water lines, such as Bacticide, CAL-EPA Registration No. 37982-20001.
- E. Contractor to provide a 1" service valve connected to the system at a point within 2'-0" of its junction with the water supply line. After sterilization is complete Contractor to provide cap at valve.
- F. Sterilization Procedure to be as follows:
 - 1. Flush pipe system by opening all outlets and letting water flow through the system until clear water flows from all outlets.

UTILITIES
SECTION 33 0000
3595001

2. Inject disinfecting agent to provide a minimum chlorine residual concentration of at least 50 parts per million (ppm) of free chlorine at each outlet.
 3. Provide sign at all outlets which reads "Water Sterilization in Progress – Do not operate". Remove signs at conclusion of test.
 4. Close all outlets and valves, including valve connecting to water supply line and 1" service valve. Retain treated water in pipe for a minimum of twenty-four hours. Should chlorine residual at pipe extremities be less than 50 PPM at this time, pipe shall be re-chlorinated. As an option, the water systems may be filled with a water-chlorine solution containing a minimum of 200 PPM of chlorine and allowed to stand for three hours.
 5. After chlorination, flush lines of chlorinated water and refill from domestic supply. Continue flushing until residual chlorine is less than or equal to 0.2 ppm, or a residual the same as that of the test water.
- G. Chemical and bacteriological tests shall be conducted by a state-certified laboratory and approved by the local authorities having jurisdiction.
- H. Submit written report to Health Department as required by State Regulations. Provide a copy of report to Architect prior to completion of project.
- I. The costs of sterilization and laboratory testing shall be paid for by the contractor.

3.10 CLEANING

- A. Upon completion of work of this Section promptly remove from the working area all scraps, debris and surplus material of this Section.

END OF SECTION

s:\master specifications\division 33 - utilities\33 0000_utilities.docx
Formatting Updated: 9-13-21

PART 1 - GENERAL

1.1 SUMMARY

- A. Summary Includes:
 - 1. Storm drainage piping systems.

1.2 RELATED REQUIREMENTS

- A. Section 01 5000, Construction Facilities and Controls.
- B. Section 01 6116, Volatile Organic Compound (VOC) Restrictions, for VOC limits pertaining to adhesives, sealants, fillers, primers, and coatings.
- C. Section 01 8113, Sustainable Design Requirements, for CAL-Green **[and Collaborative for High Performance Schools (CHPS)]** general requirements and procedures.
- D. Section 31 0000, Earthwork.
- E. Section 31 2333, Trenching and Backfilling.
- F. Section 32 1200, Asphalt Concrete Paving.
- G. Section 32 1600, Site Concrete

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CAL Green), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- C. California Plumbing Code, (CPC), edition as noted on the Drawings.
- D. Local Jurisdiction: Any work within the street, highway or right-of-way shall be performed in accordance with the requirement of the governmental agencies having jurisdiction, and shall not begin until all of those governing authorities have been notified.
- E. ASTM International (ASTM):
 - 1. D 422-63 Test Method for Particle Size Analysis of Soil.
 - 2. D698-00 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures, Using 5.5 lb (2.49 Kg) Rammer and 12 inch (304.8 mm) Drop.
 - 3. D1556-00 - Test Method for Density of Soil in Place by the Sand-Cone Method.
 - 4. D1557-02 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 10 lb. (4.54 Kg) Rammer and 18 inch (457 mm) Drop.

STORM DRAINAGE UTILITIES
SECTION 33 4000
3595001

5. D 3017-05 Test Methods for Moisture Content of Soils and Soil-Aggregate Mixture by Nuclear Methods (Shallow Depth).
6. D 4318-05 Test Method for Liquid Limit, Plastic Limit, and Plasticity Limit.

F. CALTRANS Standard Specifications.

G. CAL-OSHA, Title 8, Section 1590 (e).

1.4 ADMINISTRATIVE REQUIREMENTS

A. Submittal Procedures:

1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
3. Sustainable Design Submittals shall comply with the additional requirements of Section 01 8113, Sustainable Design Requirements.

1.5 ACTION SUBMITTALS

- A. Provide supplier's descriptive literature for all products to demonstrate compliance with specified attributes.
- B. Substitution: Provide all data of proposed material being submitted as a substitution. Provide comparison with specified product data and identify all differences. Failure to provide comparison will be reason for rejection.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: Contractor / installer.
- B. Provide sieve analysis from accredited testing lab on pipe bedding material. Analysis shall have a current date not older than project contract signing date.
- C. Sustainable Design:
1. General:
 - a. Submit information necessary to establish and document compliance with the California Green Building Standards Code.
 - b. Sustainable design submittals are in addition to other submittals.
 2. The following information shall be provided:
 - a. Adhesives and Sealants: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.
 - b. Paints and Coatings: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.

1.7 CLOSEOUT SUBMITTALS

- A. Guarantee: Submit subcontractor's guarantee.

1.8 QUALITY ASSURANCE

- A. Contractor / Installer shall have been in business for five (5) years providing/finishing similar size projects and complexity.
- B. Contractor shall be solely responsible for all subgrades built. Any repairs resulting from inadequate compaction are the responsibility of the contractor.
- C. The representatives of the Owner's testing lab will not act as supervisor of construction, nor will they direct construction operations. Neither the presence of the Owner's testing lab representatives nor the testing by the Owner's testing lab shall excuse the contractors or subcontractors for defects discovered in their work during or following completion of the project. Correcting inadequate compaction is the sole responsibility of the contractor.
- D. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.
 - 1. Sun damaged or discolored PVC pipe will be rejected.
- E. All materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.

1.9 DELIVERY, STORAGE AND HANDLING

- A. Transport, store and handle in strict accord with the local jurisdiction and manufacturer's written recommendations
- B. Deliver undamaged products to job in manufacturer's sealed containers and/or original bundles with tags and labels intact.

1.10 EXISTING SITE CONDITIONS

- A. Contractor shall acquaint himself with all site conditions. If unknown active utilities are encountered during work, notify Architect promptly for instructions. Failure to notify will make Contractor liable for damage to these utilities arising from Contractor's operations subsequent to discovery of such unknown active utilities.
- B. Existing civil, mechanical and electrical improvements are shown on respective site plans to the extent known. Should the Contractor encounter any deviation between actual conditions and those shown, he is to immediately notify the Architect before continuing work.

1.11 PROTECTION

- A. Adequate protection measures shall be provided to protect workmen and passers-by on and off the site. Adjacent property shall be fully protected throughout the operations.

STORM DRAINAGE UTILITIES
SECTION 33 4000
3595001

Blasting will not be permitted. Prevent damage to adjoining improvements and properties both above and below grade. Restore such improvements to original condition should damage occur. Replace trees and shrubs outside building area disturbed by operations.

- B. In accordance with generally accepted construction practices, the Contractor shall be solely and completely responsible for working conditions at the job site, including safety of all persons and property during performance of the work. This requirement shall apply continuously and shall not be limited to normal working hours.
- C. Any construction review of the Contractor's performance conducted by the Geotechnical Engineer is not intended to include review of the adequacy of the Contractor's safety measures, in, on, or near the construction site.
- D. Provide shoring, sheeting, sheet piles and/or bracing to prevent caving, erosion or gullyng of sides of excavation.
- E. Surface Drainage: Provide for surface drainage during period of construction in manner to avoid creating nuisance to adjacent areas. The contractor shall make a reasonable effort on a daily basis to provide pumps and all equipment necessary to keep all excavations and the site free from water during entire progress of work, regardless of cause, source, or nature of water.
- F. Adjacent streets and sidewalks shall be kept free of mud, dirt or similar nuisances resulting from earthwork operations.
- G. The site and adjacent influenced areas shall be watered as required to suppress dust nuisance. Dust control measures shall be in accordance with the local jurisdiction.
- H. Trees: Carefully protect existing trees that are to remain.

1.12 SEASONAL LIMITS

- A. No fill material shall be placed, spread or rolled during unfavorable weather conditions. When work is interrupted by rains, fill operations shall not be resumed until field tests indicate that moisture content and density of fill are satisfactory.

1.13 TESTING

- A. General: Refer to Section 01 4523 – Testing and Inspection Services, and Structural Tests and Inspections List, DSA-103.
- B. Geotechnical Engineer: Owner is retaining a Geotechnical Engineer to determine compliance of fill with Specifications, and to direct adjustments in fill operations. Costs of Geotechnical Engineer will be borne by Owner; except those costs incurred for re-tests or re-inspection will be paid by Owner and backcharged to Contractor.

1.14 RECORD DRAWINGS

- A. Keep a daily record of all pipe placed in ground, verified by Project Inspector.

STORM DRAINAGE UTILITIES
SECTION 33 4000
3595001

- B. Upon completion of this Contract, furnish one tracing showing all outside utility lines, piping, etc., installed under this Contract. Locate and dimension all work with reference to permanent landmarks.
- C. All symbols and designations used in preparing "RECORD" drawings shall match those used in Contract drawings.
- D. Properly identify all stubs for future connections, as to location and use, by setting of concrete marker at finished grade in the manner suitable to Architect.

PART 2 - PRODUCTS

2.1 DESIGN AND PERFORMANCE CRITERIA

- A. Sustainable Design:
 - 1. VOC emissions for field-applied adhesives, sealants, and sealant primers must comply with limits specified in Section 01 6116.
 - 2. VOC emissions for field-applied paints and coatings must comply with limits specified in Section 01 6116.

2.2 MATERIALS

- A. Pipe: Use one of the following, unless noted on the Drawings otherwise.
 - 1. Polyvinyl Chloride Pipe (PVC): SDR35 conforming to ASTM D3034 with elastomeric joints conforming to ASTM D3212 for pipe to 12". Sun damaged pipe will be rejected.
 - 2. High density polyethylene pipe (HDPE): The pipe shall be corrugated exterior/smooth interior pipe. 12" to 60" maximum diameter shall conform to AASHTO M294, water tight per ASTM D3212 with water tight gasket fittings.
- B. Perforated Pipe (for subdrains): Shall be ADS N12 pipe, 3 hole, ASTM F 405, AASHTO M 252; PCV ASTM D3034 SDR-35 storm drain pipe
- C. Manhole: Shall be as shown on the drawing details.
- D. Drop Inlet: Shall be as shown on the drawing details.
- E. Curb Inlet: Shall be as shown on the drawing details.
- F. Mortar: For pipe connections to concrete drainage structures, conform to ASTM C270 type N mortar. Place within one half hour after adding water.
- G. Crushed Rock: Imported washed crushed rock. Minimum 100% passing 3/4 inch sieve.
- H. Trench drain: Polycast, Polydrain or equal and as shown on drawings.
- I. Area Drains: Shall be as shown on the drawing details.

STORM DRAINAGE UTILITIES
SECTION 33 4000
3595001

- J. Floor Drains: Shall be as shown on the drawing details.
- K. Clean-outs: Shall be as shown on the drawing details.
- L. Planter drains: Shall be as detailed on the drawing details.
- M. Filter Fabric: Mirafi 140N.

PART 3 - EXECUTION

3.1 INSPECTION LAYOUT AND PREPARATION

- A. Prior to installation of the work of this Section, carefully inspect and verify by field measurements that installed work of all other trades is complete to the point where this installation may properly commence
- B. Layout all work, establish grades, locate existing underground utilities, set markers and stakes, setup and maintain barricades and protection facilities; all prior to beginning actual earthwork operations. Layout and staking shall be done by a licensed Land Surveyor or Professional Civil Engineer.
- C. Verify that specified items may be installed in accordance with the approved design.
- D. In event of discrepancy, immediately notify Owner and the Architect. Do not proceed in discrepant areas until discrepancies have been fully resolved.

3.2 EXCAVATION AND BACKFILLING

- A. General: Installation shall be in strict conformance with referenced standards, the manufacturer's written directions, as shown on the drawings and as herein specified.
- B. Verify invert elevations at points of connection to existing systems prior to any excavation. If invert elevations differ from that shown on drawings, notify Architect immediately.
- C. Excavation and Bedding:
 - 1. General: Trench straight and true to line and grade with bottom smooth and free of irregularities or rock points. Trench width in accordance with pipe manufacturer's recommendations and as per the drawings. Follow manufacturer's recommendations for use of each kind and type of pipe.
 - 2. Bedding: Provide bedding as detailed on plans for the full length of the pipe. Bedding shall have a minimum thickness beneath the pipe of 4" or 1/8 the outside diameter of the pipe, whichever is greater. Provide bell holes and depressions for pipe joints only of size required to properly make joint.
 - 3. If the trenches for the site drainage fall within areas to be lime treated, the piping shall be installed prior to any lime treatment operations.
 - a. If additional piping is added to previously lime treated areas, the contractor shall backfill the trench with class 2 aggregate base and compact to 95%.

D. Laying of Pipe:

1. General: Inspect pipe prior to placing. Set aside any defective or damaged material. Do not place pipe in water nor place pipe when trenches or weather are unsuitable. Lay pipe upgrade, true to line and grade.
2. Bell and Spigot Joints: Lubricate inside of bells and outside of spigots with soap solution or as recommended by manufacture. Wedge joints tight. Bell of bell and spigot pipe to be pointed upgrade.
3. Pipe shall be bedded uniformly throughout its length.
4. Pipe elevation shall be within 0.02 feet of design elevation as shown on plans.
5. Off Site Work: All work beyond the property lines shall be done in strict conformance with the requirements of the governing agency.

E. Backfilling:

1. General: Do not start backfill operations until required testing has been accomplished.
2. Trenches and Excavations: Backfill with material as detailed on plans, filling both sides of the pipe at the same time, carefully tamping to hold pipe in place without movement. Refer to Section 31 2333 – TRENCHING AND BACKFILLING for fill above this layer.

F. Grouting of Pipes: Grout pipes smooth and water tight at drop inlet, manholes, and curb inlets. Grout back side of hood at curb inlets all grouting shall be smooth and consistent.

G. Off Site Work: All work beyond the property lines shall be done in strict conformance with the requirements of the local agency.

H. Cutting and Patching: Remove and replace existing surface features per applicable specification section (i.e. asphaltic concrete or concrete paving) where pipe is installed in areas of existing improvements.

3.3 TOLERANCES

A. Storm Drain structure grates

1. In landscape and lawn areas $\pm 0.05'$.
2. In sidewalk and asphalt pavement $\pm 0.025'$.
3. In curb and gutter application $\pm 0.0125'$.

B. Cleanout Boxes and Lids

1. In landscape areas; 0.10 higher than surrounding finish grade, $\pm 0.05'$.
2. In sidewalks and asphalt pavement; Flush with surrounding finish grade, $\pm 0.025'$.

3.4 DEWATERING

A. Contractor to provide trench dewatering as necessary, no matter what the source is, at no additional cost to the owner.

STORM DRAINAGE UTILITIES
SECTION 33 4000
3595001

3.5 FLUSHING

- A. The Contractor shall thoroughly ball and flush the storm drain system to remove all dirt and debris. Discharge water to an approved location.

3.6 CLEANING

- A. Upon completion of work of this Section promptly remove from the working area all scraps, debris and surplus material of this Section.
- B. Clean the dirt, rocks, and debris from the drop inlets and storm drain manholes.

END OF SECTION

**Wanda Hirsch Elementary School -
Shade Structures**

1280 Dove Dr., Tracy, CA 95376

3595001

Tracy Unified School District

1875 W Lowell Ave., Tracy, CA 95376

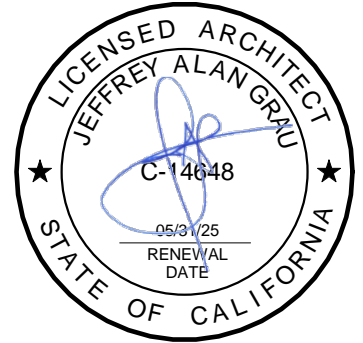


May 16, 2024

Wanda Hirsch Elementary School - Shade Structures
Tracy Unified School District
Tracy, California

May 16, 2024

HMC # 3595001



HMC ARCHITECTS
Architect



Warren Consulting Engineers
Civil Engineer



MTW Group
Landscape Architect

TABLE OF CONTENTS

DIVISION 00 - PROCUREMENT AND CONTRACTING REQUIREMENTS - NOT USED

DIVISION 01 - GENERAL REQUIREMENTS

SECTION	01 1100 - Summary of Work
	01 2100 - Allowance
	01 2513 - Product Options and Substitutions
	01 2600 - Changes in the Work
	01 2900 - Application for Payment and Conditional and Unconditional Waiver and Release Forms
	01 3119 - Project Meetings
	01 3213 - Scheduling of Work
	01 3300 - Submittal (Including Submittal Transmittal, Substitution Request, RFI, Electronic Data Request, Certification of Compliance for Building Materials, Roof Certification)
	01 3513.23 - Site Standards
	01 3516 - Alteration Project Procedures
	01 3543 - Environmental Procedures
	01 4100 - Regulatory Requirements
	01 4213 - Abbreviations and Acronyms
	01 4216 - Definitions
	01 4219 - References
	01 4300 - Materials and Equipment
	01 4500 - Quality Control
	01 4516 - Field Quality Control Procedures
	01 4523 - Testing and Inspection Services
	01 5000 - Temporary Facilities and Controls
	01 5013 - Construction Waste Management and Disposal
	01 5213 - Field Offices
	01 5639 - Temporary Tree Protection
	01 5713.10 - Erosion Control
	01 6116.10 - Volatile Organic Compound (VOC) Restrictions
	01 6600 - Product Delivery Storage and Handling
	01 7123 - Field Engineering
	01 7329 - Cutting and Patching
	01 7419 - Construction Waste Management and Disposal
	01 7419A - Contractor's Construction Waste and Recycling Plan
	01 7419B - Contractor's Reuse, Recycling and Disposal Report
	01 7600 - Alteration Project Procedures
	01 7700 - Contract Closeout and Final Cleaning
	01 7823 - Operation and Maintenance Data
	01 7836 - Warranties (Including Contractor Standard Warranty Form, Subcontractor Standard Warranty Form, Special Extended Warranty Form)
	01 7839 - Record Documents
	01 8113.10 - Sustainable Design Requirements

DIVISION 02 - EXISTING CONDITIONS - NOT USED

DIVISION 03 - CONCRETE - NOT USED

DIVISION 04 - MASONRY - NOT USED

DIVISION 05 - METALS - NOT USED

DIVISION 06 - WOOD, PLASTICS, AND COMPOSITES

SECTION	06 6400 - Fiberglass Reinforced Plastic Wall Paneling
---------	---

TABLE OF CONTENTS

DIVISION 07 - THERMAL AND MOISTURE PROTECTION - NOT USED

DIVISION 08 - OPENINGS - NOT USED

DIVISION 09 - FINISHES

SECTION 09 2900 - Gypsum Board
 09 3000 - Tiling
 09 9100 - Painting

DIVISION 10 - SPECIALTIES

SECTION 10 1400 - Signage
 10 2813 - Toilet Accessories

DIVISION 11 - EQUIPMENT - NOT USED

DIVISION 12 - FURNISHINGS - NOT USED

DIVISION 13 - SPECIAL CONSTRUCTION - NOT USED

DIVISION 14 - CONVEYING EQUIPMENT - NOT USED

DIVISION 21 - FIRE SUPPRESSION - NOT USED

DIVISION 22 - PLUMBING - NOT USED

DIVISION 23 - HEATING, VENTILATING AND AIR CONDITIONING (HVAC) - NOT USED

DIVISION 26 - ELECTRICAL - NOT USED

DIVISION 27 - COMMUNICATIONS - NOT USED

DIVISION 28 - ELECTRONIC SAFETY AND SECURITY - NOT USED

DIVISION 31 - EARTHWORK

SECTION 31 0000 - Earthwork
 31 2333 - Trenching and Backfilling

DIVISION 32 - EXTERIOR IMPROVEMENTS

SECTION 32 1200 - Asphalt Concrete Paving
 32 1600 - Site Concrete
 32 1816.16 - Synthetic Turf
 32 3113 - Chain Link Fences and Gates
 32 8000 - Irrigation
 32 9000 - Landscaping

DIVISION 33 - UTILITIES

SECTION 33 0000 - Utilities
 33 4000 - Storm Drainage Utilities

SUMMARY OF WORK

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Site Access Conditions and Requirements;
- B. Special Conditions.

1.02 SUMMARY OF WORK COVERED BY CONTRACT DOCUMENTS

- A. The Work of this Contract consists of the following at Wanda Hirsch Elementary School:
 - (1) Construction and installation of 1 - 30'x40' Four Post Hip PC shade structure, 1 - 30'x50' Joined Hip PC shade structure, existing restroom and related civil and landscape upgrades.

1.03 CONTRACTS

- A. Perform the Work under a single, fixed-price Contract.

1.04 WORK BY OTHERS

- A. Fabrication of the shade structures and play apparatus.

1.05 CODES, REGULATIONS, AND STANDARDS

- A. The codes, regulations, and standards adopted by the state and federal agencies having jurisdiction shall govern minimum requirements for this Project. Where codes, regulations, and standards conflict with the Contract Documents, these conflicts shall be brought to the immediate attention of the District and the Architect.
- B. Codes, regulations, and standards shall be as published effective as of date of bid opening, unless otherwise specified or indicated.

1.06 PROJECT RECORD DOCUMENTS

- A. Contractor shall maintain on Site one set of the following record documents; Contractor shall record actual revisions to the Work:
 - (1) Contract Drawings.
 - (2) Specifications.

- (3) Addenda.
 - (4) Change Orders and other modifications to the Contract.
 - (5) Reviewed shop drawings, product data, and samples.
 - (6) Field test records.
 - (7) Inspection certificates.
 - (8) Manufacturer's certificates.
- B. Contractor shall store Record Documents separate from documents used for construction. Provide files, racks, and secure storage for Record Documents and samples.
 - C. Contractor shall record information concurrent with construction progress.
 - D. Specifications: Contractor shall legibly mark and record at each product section of the Specifications the description of the actual product(s) installed, including the following:
 - (1) Manufacturer's name and product model and number.
 - (2) Product substitutions or alternates utilized.
 - (3) Changes made by Addenda and Change Orders and written directives.

1.07 EXAMINATION OF EXISTING CONDITIONS

- A. Contractor shall be held to have examined the Project Site and acquainted itself with the conditions of the Site and of the streets or roads approaching the Site.
- B. Prior to commencement of Work, Contractor shall survey the Site and existing buildings and improvements to observe existing damage and defects such as cracks, sags, broken, missing or damaged glazing, other building elements and Site improvements, and other damage.
- C. Should Contractor observe cracks, sags, and other damage to and defects of the Site and adjacent buildings, paving, and other items not indicated in the Contract Documents, Contractor shall immediately report same to the District and the Architect.

1.08 CONTRACTOR'S USE OF PREMISES

- A. If unoccupied and only with District's prior written approval, Contractor may use the building(s) at the Project Site without limitation for its operations, storage, and office facilities for the performance of the Work. If the District chooses to beneficially occupy any building(s), Contractor must obtain the District's written approval for Contractor's use of spaces and types of operations to be performed within the building(s) while so occupied. Contractor's access to the building(s) shall be limited to the areas indicated.

- B. If the space at the Project Site is not sufficient for Contractor's operations, storage, office facilities and/or parking, Contractor shall arrange and pay for any additional facilities needed by Contractor.
- C. Contractor shall not interfere with use of or access to occupied portions of the building(s) or adjacent property.
- D. Contractor shall maintain corridors, stairs, halls, and other exit-ways of building clear and free of debris and obstructions at all times.
- E. No one other than those directly involved in the demolition and construction, or specifically designated by the District or the Architect shall be permitted in the areas of work during demolition and construction activities.
- F. The Contractor shall install the construction fence and maintain that it will be locked when not in use. Keys to this fencing will be provided to the District.

1.09 PROTECTION OF EXISTING STRUCTURES AND UTILITIES

- A. The Drawings show above-grade and below-grade structures, utility lines, and other installations that are known or believed to exist in the area of the Work. Contractor shall locate these existing installations before proceeding with excavation and other operations that could damage same; maintain them in service, where appropriate; and repair damage to them caused by the performance of the Work. Should damage occur to these existing installations, the costs of repair shall be at the Contractor's expense and made to the District's satisfaction.
- B. Contractor shall be alert to the possibility of the existence of additional structures and utilities. If Contractor encounters additional structures and utilities, Contractor will immediately report to the District for disposition of same as indicated in the General Conditions.

1.10 UTILITY SHUTDOWNS AND INTERRUPTIONS

- A. Contractor shall give the District a minimum of three (3) days written notice in advance of any need to shut off existing utility services or to effect equipment interruptions. The District will set exact time and duration for shutdown, and will assist Contractor with shutdown. Work required to re-establish utility services shall be performed by the Contractor.
- B. Contractor shall obtain District's written approval as indicated in the General Conditions in advance of deliveries of material or equipment or other activities that may conflict with District's use of the building(s) or adjacent facilities.

1.11 STRUCTURAL INTEGRITY

- A. Contractor shall be responsible for and supervise each operation and work that could affect structural integrity of various building elements, both permanent and temporary.
- B. Contractor shall include structural connections and fastenings as indicated or required for complete performance of the Work.

PART 2 – PRODUCTS Not Used.

PART 3 – EXECUTION Not Used.

END OF DOCUMENT

ALLOWANCE

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Non-specified work.

1.2 RELATED SECTIONS

A. Document 01 10 00 (Summary of Work)

B. Document 01 29 00 (Application for Payment)

C. Document 01 33 00 (Submittal Procedures)

1.3 ALLOWANCES

- A. Included in the Contract, a stipulated sum/price of **[INSERT AMOUNT]** as an allowance for DSA Revisions within the limits set forth in the Contract Documents. This Allowance shall not be utilized without written approval by the District.
- B. Contractor's costs, without overhead and profit, for products, delivery, installation, labor, insurance, payroll, taxes, bonding and equipment rental will be included in Allowance Expenditure Directive authorizing expenditure of funds from this Allowance. No overhead and profit shall be added to the Allowance Expenditure Directive.
- C. Funds will be drawn from Allowance only with District approval evidenced by an Allowance Expenditure Directive.
- D. At Contract closeout, funds remaining in Allowance will be credited to District by Change Order.
- E. Whenever costs are more than the Allowance, the amount covered by the Allowance will be approved at cost. The Contract Price shall be adjusted by Change Order for amounts in excess of the Allowance.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

END OF DOCUMENT

PRODUCT OPTIONS AND SUBSTITUTIONS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. Instructions to Bidders;
- B. General Conditions, including, without limitation, Substitutions For Specified Items; and
- C. Special Conditions.

1.02 SUBSTITUTIONS OF MATERIALS AND EQUIPMENT

- A. Catalog numbers and specific brands or trade names followed by the designation "or equal" are used in conjunction with material and equipment required by the Specifications to establish the standards of quality, utility, and appearance required. Substitutions which are equal in quality, utility, and appearance to those specified may be reviewed subject to the provisions of the General Conditions.
- B. Wherever more than one manufacturer's product is specified, the first-named product is the basis for the design used in the work and the use of alternative-named manufacturers' products or substitutes may require modifications in that design. If such alternatives are proposed by Contractor and are approved by the District and/or the Architect, Contractor shall assume all costs required to make necessary revisions and modifications of the design resulting from the substitutions requested by the Contractor.
- C. When materials and equipment are specified by first manufacturer's name and product number, second manufacturer's name and "or approved equal," supporting data for the second product, if proposed by Contractor, shall be submitted in accordance with the requirements for substitutions. The District's Board has found and determined that certain item(s) shall be used on this Project based on the purpose(s) indicated pursuant to Public Contract Code section 3400(c). These findings, as well as the products and brand or trade names, have been identified in the Notice to Bidders.
- D. The Contractor will not be allowed to substitute specified items unless the request for substitution is submitted as follows:
 - (1) District must receive any notice of request for substitution of a specified item a minimum of ten (10) calendar days prior to bid opening.

- (2) Within 35 days after the date of the Notice of Award, the Contractor shall submit data substantiating the request(s) for all substitution(s) containing sufficient information to assess acceptability of product or system and impact on Project, including, without limitation, the requirements specified in the Special Conditions and the technical Specifications. Insufficient information shall be grounds for rejection of substitution.
- E. If the District and/or Architect, in reviewing proposed substitute materials and equipment, require revisions or corrections to be made to previously accepted Shop Drawings and supplemental supporting data to be resubmitted, Contractor shall promptly do so. If any proposed substitution is judged by the District and/or Architect to be unacceptable, the specified material or equipment shall be provided.
- F. Samples may be required. Tests required by the District and/or Architect for the determination of quality and utility shall be made at the expense of Contractor, with acceptance of the test procedure first given by the District.
- G. In reviewing the supporting data submitted for substitutions, the District and/or Architect will use for purposes of comparison all the characteristics of the specified material or equipment as they appear in the manufacturer's published data even though all the characteristics may not have been particularly mentioned in the Contract Documents. If more than two (2) submissions of supporting data are required, the cost of reviewing the additional supporting data shall be borne by Contractor, and the District will deduct the costs from the Contract Price. The Contractor shall be responsible for any re-design costs occasioned by District's acceptance and/or approval of any substitute.
- H. The Contractor shall, in the event that a substitute is less costly than that specified, credit the District with one hundred percent (100%) of the net difference between the substitute and the originally specified material. In this event, the Contractor agrees to execute a deductive Change Order to reflect that credit. In the event Contractor furnishes a material, process, or article more expensive than that specified, the difference in the cost of that material, process, or article so furnished shall be borne by Contractor.
- I. In no event shall the District be liable for any increase in Contract Price or Contract Time due to any claimed delay in the evaluation of any proposed substitute or in the acceptance or rejection of any proposed substitute.

PART 2 – PRODUCTS Not Used.

PART 3 – EXECUTION Not Used.

END OF DOCUMENT

DOCUMENT 01 26 00

CHANGES IN THE WORK

CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE PROVISIONS IN THE AGREEMENT, GENERAL CONDITIONS, AND SPECIAL CONDITIONS, IF USED, RELATED TO CHANGES AND/OR REQUESTS FOR CHANGES.

END OF DOCUMENT

DOCUMENT 01 29 00

**APPLICATION FOR PAYMENT AND
CONDITIONAL AND UNCONDITIONAL WAIVER AND RELEASE FORMS**

**CONTRACTOR SHALL COMPLY WITH ALL PROVISIONS IN THE GENERAL
CONDITIONS RELATED TO APPLICATIONS FOR PAYMENT AND/OR PAYMENTS.**

**CONDITIONAL WAIVER AND RELEASE
ON PROGRESS PAYMENT
(CIVIL CODE SECTION 8132)**

NOTICE: THIS DOCUMENT WAIVES THE CLAIMANT'S LIEN, STOP PAYMENT NOTICE, AND PAYMENT BOND RIGHTS EFFECTIVE ON RECEIPT OF PAYMENT. A PERSON SHOULD NOT RELY ON THIS DOCUMENT UNLESS SATISFIED THAT THE CLAIMANT HAS RECEIVED PAYMENT.

Name of Claimant: _____

Name of Customer: _____

Job Location: _____

Owner: _____

Through Date: _____

Conditional Waiver and Release

This document waives and releases lien, stop payment notice, and payment bond rights the claimant has for labor and service provided, and equipment and material delivered, to the customer on this job through the Through Date of this document. Rights based upon labor or service provided, or equipment or material delivered, pursuant to a written change order that has been fully executed by the parties prior to the date that this document is signed by the claimant, are waived and released by this document, unless listed as an Exception below. This document is effective only on the claimant's receipt of payment from the financial institution on which the following check is drawn:

Maker of Check: _____

Amount of Check: \$_____

Check Payable to: _____

Exceptions

This document does not affect any of the following:

- (1) Retentions.
- (2) Extras for which the claimant has not received payment.
- (3) The following progress payments for which the claimant has previously given a conditional waiver and release but has not received payment:

Date(s) of waiver and release: _____

Amount(s) of unpaid progress payment(s): \$_____

TRACY UNIFIED SCHOOL DISTRICT

**APPLICATION FOR PAYMENT AND
CONDITIONAL AND UNCONDITIONAL
WAIVER AND RELEASE FORMS
DOCUMENT 01 29 00-2**

- (4) Contract rights, including (A) a right based on rescission, abandonment, or breach of contract, and (B) the right to recover compensation for work not compensated by the payment.

Claimant's Signature: _____

Claimant's Title: _____

Date of Signature: _____

**UNCONDITIONAL WAIVER AND RELEASE
ON PROGRESS PAYMENT
(CIVIL CODE SECTION 8134)**

NOTICE TO CLAIMANT: THIS DOCUMENT WAIVES AND RELEASES LIEN, STOP PAYMENT NOTICE, AND PAYMENT BOND RIGHTS UNCONDITIONALLY AND STATES THAT YOU HAVE BEEN PAID FOR GIVING UP THOSE RIGHTS. THIS DOCUMENT IS ENFORCEABLE AGAINST YOU IF YOU SIGN IT, EVEN IF YOU HAVE NOT BEEN PAID. IF YOU HAVE NOT BEEN PAID, USE A CONDITIONAL WAIVER AND RELEASE FORM.

Name of Claimant: _____

Name of Customer: _____

Job Location: _____

Owner: _____

Through Date: _____

Unconditional Waiver and Release

This document waives and releases lien, stop payment notice, and payment bond rights the claimant has for labor and service provided, and equipment and material delivered, to the customer on this job through the Through Date of this document. Rights based upon labor or service provided, or equipment or material delivered, pursuant to a written change order that has been fully executed by the parties prior to the date that this document is signed by the claimant, are waived and released by this document, unless listed as an Exception below. The claimant has received the following progress payment: \$_____

Exceptions

This document does not affect any of the following:

- (1) Retentions.
- (2) Extras for which the claimant has not received payment.
- (3) Contract rights, including (A) a right based on rescission, abandonment, or breach of contract, and (B) the right to recover compensation for work not compensated by the payment.

Claimant's Signature: _____

Claimant's Title: _____

Date of Signature: _____

**CONDITIONAL WAIVER AND RELEASE
ON FINAL PAYMENT**
(CIVIL CODE SECTION 8136)

NOTICE: THIS DOCUMENT WAIVES THE CLAIMANT'S LIEN, STOP PAYMENT NOTICE, AND PAYMENT BOND RIGHTS EFFECTIVE ON RECEIPT OF PAYMENT. A PERSON SHOULD NOT RELY ON THIS DOCUMENT UNLESS SATISFIED THAT THE CLAIMANT HAS RECEIVED PAYMENT.

Name of Claimant: _____

Name of Customer: _____

Job Location: _____

Owner: _____

Conditional Waiver and Release

This document waives and releases lien, stop payment notice, and payment bond rights the claimant has for labor and service provided, and equipment and material delivered, to the customer on this job. Rights based upon labor or service provided, or equipment or material delivered, pursuant to a written change order that has been fully executed by the parties prior to the date that this document is signed by the claimant, are waived and released by this document, unless listed as an Exception below. This document is effective only on the claimant's receipt of payment from the financial institution on which the following check is drawn:

Maker of Check:

Amount of Check: \$_____

Check Payable to: _____

Exceptions

This document does not affect any of the following: _____

Disputed claims for extras in the amount of: \$_____

Claimant's Signature: _____

Claimant's Title: _____

Date of Signature: _____

**UNCONDITIONAL WAIVER AND RELEASE
ON FINAL PAYMENT**
(CIVIL CODE SECTION 8138)

NOTICE TO CLAIMANT: THIS DOCUMENT WAIVES AND RELEASES LIEN, STOP PAYMENT NOTICE, AND PAYMENT BOND RIGHTS UNCONDITIONALLY AND STATES THAT YOU HAVE BEEN PAID FOR GIVING UP THOSE RIGHTS. THIS DOCUMENT IS ENFORCEABLE AGAINST YOU IF YOU SIGN IT, EVEN IF YOU HAVE NOT BEEN PAID. IF YOU HAVE NOT BEEN PAID, USE A CONDITIONAL WAIVER AND RELEASE FORM.

Name of Claimant: _____

Name of Customer: _____

Job Location: _____

Owner: _____

Unconditional Waiver and Release

This document waives and releases lien, stop payment notice, and payment bond rights the claimant has for all labor and service provided, and equipment and material delivered, to the customer on this job. Rights based upon labor or service provided, or equipment or material delivered, pursuant to a written change order that has been fully executed by the parties prior to the date that this document is signed by the claimant, are waived and released by this document, unless listed as an Exception below. The claimant has been paid in full.

Exceptions

This document does not affect any of the following: _____

Disputed claims for extras in the amount of: \$_____

Claimant's Signature: _____

Claimant's Title: _____

Date of Signature: _____

PROJECT MEETINGS

PART 1 – GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions; and
- B. Special Conditions.

1.02 PROGRESS MEETINGS:

- A. Contractor shall schedule and hold regular weekly progress meetings after a minimum of one week's prior written notice of the meeting date and time to all Invitees as indicated below.
- B. Location: Contractor's field office.
- C. The Contractor shall notify and invite the following entities ("Invitees"):
 - (1) District Representative.
 - (2) Contractor.
 - (3) Contractor's Project Manager.
 - (4) Contractor's Superintendent.
 - (5) Subcontractors, as appropriate to the agenda of the meeting.
 - (6) Suppliers, as appropriate to the agenda of the meeting.
 - (7) Construction Manager, if any.
 - (8) Architect
 - (9) Engineer(s), if any and as appropriate to the agenda of the meeting.
 - (10) Others, as appropriate to the agenda of the meeting.
- D. The District's and/or the Architect's Consultants will attend at their discretion, in response to the agenda.
- E. The District representative, the Construction Manager, and/or another District Agent shall take and distribute meeting notes to attendees and other concerned parties. If exceptions are taken to anything in the meeting notes,

those exceptions shall be stated in writing to the District within five (5) working days following District's distribution of the meeting notes.

1.03 PRE-INSTALLATION/PERFORMANCE MEETING:

- A. Contractor shall schedule a meeting prior to the start of each of the demolition work phases. Contractor shall invite all Invitees to this meeting, and others whose work may affect or be affected by the quality of the demolition work.
- B. Contractor shall review in detail prior to this meeting, the manufacturer's requirements and specifications, applicable portions of the Contract Documents, Shop Drawings, and other submittals, and other related work. At this meeting, invitees shall review and resolve conflicts, incompatibilities, or inadequacies discovered or anticipated.
- C. Contractor shall review in detail Project conditions, schedule, requirements for performance, application, installation, and quality of completed Work, and protection of adjacent Work and property.
- D. Contractor shall review in detail means of protecting the completed Work during the remainder of the construction period.

PART 2 - PRODUCTS Not Used.

PART 3 - EXECUTION Not Used.

END OF DOCUMENT

SCHEDULING OF WORK

PART 1 – GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions;
- B. Special Conditions;
- C. Summary of Work; and
- D. Submittals.

1.02 SECTION INCLUDES

- A. Scheduling of Work under this Contract shall be performed by Contractor in accordance with requirements of this Section.
 - (1) Development of schedule, cost and resource loading of the schedule, monthly payment requests, and project status reporting requirements of the Contract shall employ computerized Critical Path Method ("CPM") scheduling ("CPM Schedule").
 - (2) CPM Schedule shall be cost loaded based on Schedule of Values as approved by District.
 - (3) Submit schedules and reports as specified in the General Conditions.
- B. Upon Award of Contract, Contractor shall immediately commence development of Initial and Original CPM Schedules to ensure compliance with CPM Schedule submittal requirements.

1.03 CONSTRUCTION SCHEDULE

- A. Within ten (10) days of issuance of the issuance Notice to Proceed and before request for first progress payment, the Contractor shall prepare and submit to the Project Manager a construction progress schedule conforming to the Milestone Schedule below.
- B. The Construction Schedule shall be continuously updated, and an updated schedule shall be submitted with each application for progress payment. Each revised schedule shall indicate the work actually accomplished during the previous period and the schedule for completion of the remaining work.

C. Milestone Schedule:

ACTIVITY DESCRIPTION

REQUIRED COMPLETION

CONSTRUCTION STARTS

05-26-2022

PHASE 1 DEMOLITION

PHASE 2 DEMOLITION

FINAL PROJECT COMPLETION

1.04 QUALIFICATIONS

- A. Contractor shall employ experienced scheduling personnel qualified to use the latest version of [i.e., Primavera Project Planner]. Experience level required is set forth below. Contractor may employ such personnel directly or may employ a consultant for this purpose.
- (1) The written statement shall identify the individual who will perform CPM scheduling.
 - (2) Capability and experience shall be verified by description of construction projects on which individual has successfully applied computerized CPM.
 - (3) Required level of experience shall include at least two (2) projects of similar nature and scope with value not less than three fourths ($\frac{3}{4}$) of the Total Bid Price of this Project. The written statement shall provide contact persons for referenced projects with current telephone and address information.
- B. District reserves the right to approve or reject Contractor's scheduler or consultant at any time. District reserves the right to refuse replacing of Contractor's scheduler or consultant, if District believes replacement will negatively affect the scheduling of Work under this Contract.

1.05 GENERAL

- A. Progress Schedule shall be based on and incorporate milestone and completion dates specified in Contract Documents.
- B. Overall time of completion and time of completion for each milestone shown on Progress Schedule shall adhere to times in the Contract, unless an earlier (advanced) time of completion is requested by Contractor and agreed to by District. Any such agreement shall be formalized by a Change Order.
- (1) District is not required to accept an early completion schedule, i.e., one that shows an earlier completion date than the Contract Time.
 - (2) Contractor shall not be entitled to extra compensation in event agreement is reached on an earlier completion schedule and Contractor completes its Work, for whatever reason, beyond completion date shown in its early completion schedule but within the Contract Time.

- (3) A schedule showing the work completed in less than the Contract Time, and that has been accepted by District, shall be considered to have Project Float. The Project Float is the time between the scheduled completion of the work and the Completion Date. Project Float is a resource available to both District and the Contractor.
- C. Ownership Project Float: Neither the District nor Contractor owns Project Float. The Project owns the Project Float. As such, liability for delay of the Completion Date rests with the party whose actions, last in time, actually cause delay to the Completion Date.
 - (1) For example, if Party A uses some, but not all of the Project Float and Party B later uses remainder of the Project Float as well as additional time beyond the Project Float, Party B shall be liable for the time that represents a delay to the Completion Date.
 - (2) Party A would not be responsible for the time since it did not consume the entire Project Float and additional Project Float remained; therefore, the Completion Date was unaffected by Party A.
- D. Progress Schedule shall be the basis for evaluating job progress, payment requests, and time extension requests. Responsibility for developing Contract CPM Schedule and monitoring actual progress as compared to Progress Schedule rests with Contractor.
- E. Failure of Progress Schedule to include any element of the Work, or any inaccuracy in Progress Schedule, will not relieve Contractor from responsibility for accomplishing the Work in accordance with the Contract. District's acceptance of schedule shall be for its use in monitoring and evaluating job progress, payment requests, and time extension requests and shall not, in any manner, impose a duty of care upon District, or act to relieve Contractor of its responsibility for means and methods of construction.
- F. Software: Use [i.e, District Project Planner for Windows, latest version]. Such software shall be compatible with Windows operating system. Contractor shall transmit contract file to District on compact disk at times requested by District.
- G. Transmit each item under the form approved by District.
 - (1) Identify Project with District Contract number and name of Contractor.
 - (2) Provide space for Contractor's approval stamp and District's review stamps.
 - (3) Submittals received from sources other than Contractor will be returned to the Contractor without District's review.

1.06 INITIAL CPM SCHEDULE

- A. Initial CPM Schedule submitted for review at the pre-construction conference shall serve as Contractor's schedule for up to ninety (90) calendar days after the Notice to Proceed.

- B. Indicate detailed plan for the Work to be completed in first ninety (90) days of the Contract; details of planned mobilization of plant and equipment; sequence of early operations; procurement of materials and equipment. Show Work beyond ninety (90) calendar days in summary form.
- C. Initial CPM Schedule shall be time scaled.
- D. Initial CPM Schedule shall be cost and resource loaded. Accepted cost and resource loaded schedule will be used as basis for monthly progress payments until acceptance of the Original CPM Schedule. Use of Initial CPM Schedule for progress payments shall not exceed ninety (90) calendar days.
- E. District and Contractor shall meet to review and discuss the Initial CPM Schedule within seven (7) calendar days after it has been submitted to District.
 - (1) District's review and comment on the schedule shall be limited to Contract conformance (with sequencing, coordination, and milestone requirements).
 - (2) Contractor shall make corrections to schedule necessary to comply with Contract requirements and shall adjust schedule to incorporate any missing information requested by District. Contractor shall resubmit Initial CPM Schedule if requested by District.
- F. If, during the first ninety (90) days after Notice to Proceed, the Contractor is of the opinion that any of the Work included on its Initial CPM Schedule has been impacted, the Contractor shall submit to District a written Time Impact Evaluation ("TIE") in accordance with Article 1.12 of this Section. The TIE shall be based on the most current update of the Initial CPM Schedule.

1.07 ORIGINAL CPM SCHEDULE

- A. Submit a detailed proposed Original CPM Schedule presenting an orderly and realistic plan for completion of the Work in conformance with requirements as specified herein.
- B. Progress Schedule shall include or comply with following requirements:
 - (1) Time scaled, cost and resource (labor and major equipment) loaded CPM schedule.
 - (2) No activity on schedule shall have duration longer than fifteen (15) work days, with exception of submittal, approval, fabrication and procurement activities, unless otherwise approved by District.
 - (a) Activity durations shall be total number of actual work days required to perform that activity.
 - (3) The start and completion dates of all items of Work, their major components, and milestone completion dates, if any.

- (4) District furnished materials and equipment, if any, identified as separate activities.
- (5) Activities for maintaining Project Record Documents.
- (6) Dependencies (or relationships) between activities.
- (7) Processing/approval of submittals and shop drawings for all material and equipment required per the Contract. Activities that are dependent on submittal acceptance or material delivery shall not be scheduled to start earlier than expected acceptance or delivery dates.
 - (a) Include time for submittals, re-submittals and reviews by District. Coordinate with accepted schedule for submission of Shop Drawings, samples, and other submittals.
 - (b) Contractor shall be responsible for all impacts resulting from re-submittal of Shop Drawings and submittals.
- (8) Procurement of major equipment, through receipt and inspection at jobsite, identified as separate activity.
 - (a) Include time for fabrication and delivery of manufactured products for the Work.
 - (b) Show dependencies between procurement and construction.
- (9) Activity description; what Work is to be accomplished and where.
- (10) The total cost of performing each activity shall be total of labor, material, and equipment, excluding overhead and profit of Contractor. Overhead and profit of the General Contractor shall be shown as a separate activity in the schedule. Sum of cost for all activities shall equal total Contract value.
- (11) Resources required (labor and major equipment) to perform each activity.
- (12) Responsibility code for each activity corresponding to Contractor or Subcontractor responsible for performing the Work.
- (13) Identify the activities which constitute the controlling operations or critical path. No more than twenty-five (25%) of the activities shall be critical or near critical. Near critical is defined as float in the range of one (1) to (10) days.
- (14) Twenty (20) workdays for developing punch list(s), completion of punch-list items, and final clean up for the Work or any designated portion thereof. No other activities shall be scheduled during this period.
- (15) Interface with the work of other contractors, District, and agencies such as, but not limited to, utility companies.

- (16) Show detailed Subcontractor Work activities. In addition, furnish copies of Subcontractor schedules upon which CPM was built.
 - (a) Also furnish for each Subcontractor, as determined by District, submitted on Subcontractor letterhead, a statement certifying that Subcontractor concurs with Contractor's Original CPM Schedule and that Subcontractor's related schedules have been incorporated, including activity duration, cost and resource loading.
 - (b) Subcontractor schedules shall be independently derived and not a copy of Contractor's schedule.
 - (c) In addition to Contractor's schedule and resource loading, obtain from electrical, mechanical, and plumbing Subcontractors, and other Subcontractors as required by District, productivity calculations common to their trades, such as units per person day, feet of pipe per day per person, feet of wiring per day per person, and similar information.
 - (d) Furnish schedule for Contractor/Subcontractor CPM schedule meetings which shall be held prior to submission of Original CPM schedule to District. District shall be permitted to attend scheduled meetings as an observer.
- (17) Activity durations shall be in Work days.
- (18) Submit with the schedule a list of anticipated non-Work days, such as weekends and holidays. The Progress Schedule shall exclude in its Work day calendar all non-Work days on which Contractor anticipates critical Work will not be performed.
- C. Original CPM Schedule Review Meeting: Contractor shall, within sixty (60) days from the Notice to Proceed date, meet with District to review the Original CPM Schedule submittal.
 - (1) Contractor shall have its Project Manager, Project Superintendent, Project Scheduler, and key Subcontractor representatives, as required by District, in attendance. The meeting will take place over a continuous one (1) day period.
 - (2) District's review will be limited to submittal's conformance to Contract requirements including, but not limited to, coordination requirements. However, review may also include:
 - (a) Clarifications of Contract Requirements.
 - (b) Directions to include activities and information missing from submittal.
 - (c) Requests to Contractor to clarify its schedule.

- (3) Within five (5) days of the Schedule Review Meeting, Contractor shall respond in writing to all questions and comments expressed by District at the Meeting.

1.08 ADJUSTMENTS TO CPM SCHEDULE

- A. Adjustments to Original CPM Schedule: Contractor shall have adjusted the Original CPM Schedule submittal to address all review comments from original CPM Schedule review meeting and resubmit network diagrams and reports for District's review.
 - (1) District, within ten (10) days from date that Contractor submitted the revised schedule, will either:
 - (a) Accept schedule and cost and resource loaded activities as submitted, or
 - (b) Advise Contractor in writing to review any part or parts of schedule which either do not meet Contract requirements or are unsatisfactory for District to monitor Project's progress, resources, and status or evaluate monthly payment request by Contractor.
 - (2) District may accept schedule with conditions that the first monthly CPM Schedule update be revised to correct deficiencies identified.
 - (3) When schedule is accepted, it shall be considered the "Original CPM Schedule" which will then be immediately updated to reflect the current status of the work.
 - (4) District reserves right to require Contractor to adjust, add to, or clarify any portion of schedule which may later be discovered to be insufficient for monitoring of Work or approval of partial payment requests. No additional compensation will be provided for such adjustments, additions, or clarifications.
- B. Acceptance of Contractor's schedule by District will be based solely upon schedule's compliance with Contract requirements.
 - (1) By way of Contractor assigning activity durations and proposing sequence of Work, Contractor agrees to utilize sufficient and necessary management and other resources to perform work in accordance with the schedule.
 - (2) Upon submittal of schedule update, updated schedule shall be considered "current" CPM Schedule.
 - (3) Submission of Contractor's schedule to District shall not relieve Contractor of total responsibility for scheduling, sequencing, and pursuing Work to comply with requirements of Contract Documents, including adverse effects such as delays resulting from ill-timed Work.

- C. Submittal of Original CPM Schedule, and subsequent schedule updates, shall be understood to be Contractor's representation that the Schedule meets requirements of Contract Documents and that Work shall be executed in sequence indicated on the schedule.
- D. Contractor shall distribute Original CPM Schedule to Subcontractors for review and written acceptance, which shall be noted on Subcontractors' letterheads to Contractor and transmitted to District for the record.

1.09 MONTHLY CPM SCHEDULE UPDATE SUBMITTALS

- A. Following acceptance of Contractor's Original CPM Schedule, Contractor shall monitor progress of Work and adjust schedule each month to reflect actual progress and any anticipated changes to planned activities.
 - (1) Each schedule update submitted shall be complete, including all information requested for the Original CPM Schedule submittal.
 - (2) Each update shall continue to show all Work activities including those already completed. These completed activities shall accurately reflect "as built" information by indicating when activities were actually started and completed.
- B. A meeting will be held on approximately the twenty-fifth (25th) of each month to review the schedule update submittal and progress payment application.
 - (1) At this meeting, at a minimum, the following items will be reviewed: Percent (%) complete of each activity; Time Impact Evaluations for Change Orders and Time Extension Request; actual and anticipated activity sequence changes; actual and anticipated duration changes; and actual and anticipated Contractor delays.
 - (2) These meetings are considered a critical component of overall monthly schedule update submittal and Contractor shall have appropriate personnel attend. At a minimum, these meetings shall be attended by Contractor's General Superintendent and Scheduler.
 - (3) Contractor shall plan on the meeting taking no less than four (4) hours.
- C. Within five (5) working days after monthly schedule update meeting, Contractor shall submit the updated CPM Schedule update.
- D. Within five (5) work days of receipt of above noted revised submittals, District will either accept or reject monthly schedule update submittal.
 - (1) If accepted, percent (%) complete shown in monthly update will be basis for Application for Payment by the Contractor. The schedule update shall be submitted as part of the Contractor's Application for Payment.

- (2) If rejected, update shall be corrected and resubmitted by Contractor before the Application for Payment is submitted.
- E. Neither updating, changing or revising of any report, curve, schedule, or narrative submitted to District by Contractor under this Contract, nor District's review or acceptance of any such report, curve, schedule or narrative shall have the effect of amending or modifying in any way the Completion Date or milestone dates or of modifying or limiting in any way Contractor's obligations under this Contract.

1.10 SCHEDULE REVISIONS

- A. Updating the Schedule to reflect actual progress shall not be considered revisions to the Schedule. Since scheduling is a dynamic process, revisions to activity durations and sequences are expected on a monthly basis.
- B. To reflect revisions to the Schedule, the Contractor shall provide District with a written narrative with a full description and reasons for each Work activity revised. For revisions affecting the sequence of work, the Contractor shall provide a schedule diagram which compares the original sequence to the revised sequence of work. The Contractor shall provide the written narrative and schedule diagram for revisions two (2) working days in advance of the monthly schedule update meeting.
- C. Schedule revisions shall not be incorporated into any schedule update until the revisions have been reviewed by District. District may request further information and justification for schedule revisions and Contractor shall, within three (3) days, provide District with a complete written narrative response to District's request.
- D. If the Contractor's revision is still not accepted by District, and the Contractor disagrees with District's position, the Contractor has seven (7) calendar days from receipt of District's letter rejecting the revision to provide a written narrative providing full justification and explanation for the revision. The Contractor's failure to respond in writing within seven (7) calendar days of District's written rejection of a schedule revision shall be contractually interpreted as acceptance of District's position, and the Contractor waives its rights to subsequently dispute or file a claim regarding District's position.
- E. At District's discretion, the Contractor can be required to provide Subcontractor certifications of performance regarding proposed schedule revisions affecting said Subcontractors.

1.11 RECOVERY SCHEDULE

- A. If the Schedule Update shows a completion date twenty-one (21) calendar days beyond the Contract Completion Date, or individual milestone completion dates, the Contractor shall submit to District the proposed revisions to recover the lost time within seven (7) calendar days. As part of this submittal, the Contractor shall provide a written narrative for each revision made to recapture the lost time. If the revisions include sequence changes, the Contractor shall provide a schedule diagram comparing the original sequence to the revised sequence of work.

- B. The revisions shall not be incorporated into any schedule update until the revisions have been reviewed by District.
- C. If the Contractor's revisions are not accepted by District, District and the Contractor shall follow the procedures in paragraph 1.09.C, 1.09.D and 1.09.E above.
- D. At District's discretion, the Contractor can be required to provide Subcontractor certifications for revisions affecting said Subcontractors.

1.12 TIME IMPACT EVALUATION ("TIE") FOR CHANGE ORDERS, AND OTHER DELAYS

- A. When Contractor is directed to proceed with changed Work, the Contractor shall prepare and submit within fourteen (14) calendar days from the Notice to Proceed a TIE which includes both a written narrative and a schedule diagram depicting how the changed Work affects other schedule activities. The schedule diagram shall show how the Contractor proposes to incorporate the changed Work in the schedule and how it impacts the current schedule-update critical path. The Contractor is also responsible for requesting time extensions based on the TIE's impact on the critical path. The diagram must be tied to the main sequence of schedule activities to enable District to evaluate the impact of changed Work to the scheduled critical path.
- B. Contractor shall be required to comply with the requirements of Paragraph 1.09.A for all types of delays such as, but not limited to, Contractor/Subcontractor delays, adverse weather delays, strikes, procurement delays, fabrication delays, etc.
- C. Contractor shall be responsible for all costs associated with the preparation of TIEs, and the process of incorporating them into the current schedule update. The Contractor shall provide District with four (4) copies of each TIE.
- D. Once agreement has been reached on a TIE, the Contract Time will be adjusted accordingly. If agreement is not reached on a TIE, the Contract Time may be extended in an amount District allows, and the Contractor may submit a claim for additional time claimed by contractor.

1.13 TIME EXTENSIONS

- A. The Contractor is responsible for requesting time extensions for time impacts that, in the opinion of the Contractor, impact the critical path of the current schedule update. Notice of time impacts shall be given in accord with the General Conditions.
- B. Where an event for which District is responsible impacts the projected Completion Date, the Contractor shall provide a written mitigation plan, including a schedule diagram, which explains how (e.g., increase crew size, overtime, etc.) the impact can be mitigated. The Contractor shall also include a detailed cost breakdown of the labor, equipment, and material the Contractor would expend to mitigate District-caused time impact. The Contractor shall submit its mitigation plan to District within fourteen (14)

calendar days from the date of discovery of the impact. The Contractor is responsible for the cost to prepare the mitigation plan.

- C. Failure to request time, provide TIE, or provide the required mitigation plan will result in Contractor waiving its right to a time extension and cost to mitigate the delay.
- D. No time will be granted under this Contract for cumulative effect of changes.
- E. District will not be obligated to consider any time extension request unless the Contractor complies with the requirements of Contract Documents.
- F. Failure of the Contractor to perform in accordance with the current schedule update shall not be excused by submittal of time extension requests.
- G. If the Contractor does not submit a TIE within the required fourteen (14) calendar days for any issue, it is mutually agreed that the Contractor does not require a time extension for said issue.

1.14 SCHEDULE REPORTS

- A. Submit four (4) copies of the following reports with the Initial CPM Schedule, the Original CPM Schedule, and each monthly update.
- B. Required Reports:
 - (1) Two activity listing reports: one sorted by activity number and one by total Project Float. These reports shall also include each activity's early/late and actual start and finish dates, original and remaining duration, Project Float, responsibility code, and the logic relationship of activities.
 - (2) Cost report sorted by activity number including each activity's associated cost, percentage of Work accomplished, earned value- to date, previous payments, and amount earned for current update period.
 - (3) Schedule plots presenting time-scaled network diagram showing activities and their relationships with the controlling operations or critical path clearly highlighted.
 - (4) Cash flow report calculated by early start, late start, and indicating actual progress. Provide an exhibit depicting this information in graphic form.
 - (5) Planned versus actual resource (i.e., labor) histogram calculated by early start and late start.
- C. Other Reports:

In addition to above reports, District may request, from month to month, any two of the following reports. Submit four (4) copies of all reports.

- (1) Activities by early start.
 - (2) Activities by late start.
 - (3) Activities grouped by Subcontractors or selected trades.
 - (4) Activities with scheduled early start dates in a given time frame, such as fifteen (15) or thirty (30) day outlook.
- D. Furnish District with report files on compact disks containing all schedule files for each report generated.

1.15 PROJECT STATUS REPORTING

- A. In addition to submittal requirements for CPM scheduling identified in this Section, Contractor shall provide a monthly project status report (i.e., written narrative report) to be submitted in conjunction with each CPM Schedule as specified herein. Status reporting shall be in form specified below.
- B. Contractor shall prepare monthly written narrative reports of status of Project for submission to District. Written status reports shall include:
- (1) Status of major Project components (percent (%) complete, amount of time ahead or behind schedule) and an explanation of how Project will be brought back on schedule if delays have occurred.
 - (2) Progress made on critical activities indicated on CPM Schedule.
 - (3) Explanations for any lack of work on critical path activities planned to be performed during last month.
 - (4) Explanations for any schedule changes, including changes to logic or to activity durations.
 - (5) List of critical activities scheduled to be performed next month.
 - (6) Status of major material and equipment procurement.
 - (7) Any delays encountered during reporting period.
 - (8) Contractor shall provide printed report indicating actual versus planned resource loading for each trade and each activity. This report shall be provided on weekly and monthly basis.
 - (a) Actual resource shall be accumulated in field by Contractor, and shall be as noted on Contractor's daily reports. These reports will be basis for information provided in computer-generated monthly and weekly printed reports.
 - (b) Contractor shall explain all variances and mitigation measures.

- (9) Contractor may include any other information pertinent to status of Project. Contractor shall include additional status information requested by District at no additional cost.
- (10) Status reports, and the information contained therein, shall not be construed as claims, notice of claims, notice of delay, or requests for changes or compensation.

1.16 WEEKLY SCHEDULE REPORT

At the Weekly Progress Meeting, the Contractor shall provide and present a time-scaled three (3) week look-ahead schedule that is based and correlated by activity number to the current schedule (i.e., Initial, Original CPM, or Schedule Update).

1.17 DAILY CONSTRUCTION REPORTS

On a daily basis, Contractor shall submit a daily activity report to District for each workday, including weekends and holidays when worked. Contractor shall develop the daily construction reports on a computer-generated database capable of sorting daily Work, manpower, and man-hours by Contractor, Subcontractor, area, sub-area, and Change Order Work. Upon request of District, furnish computer disk of this data base. Obtain District's written approval of daily construction report data base format prior to implementation. Include in report:

- A. Project name and Project number.
- B. Contractor's name and address.
- C. Weather, temperature, and any unusual site conditions.
- D. Brief description and location of the day's scheduled activities and any special problems and accidents, including Work of Subcontractors. Descriptions shall be referenced to CPM scheduled activities.
- E. Worker quantities for its own Work force and for Subcontractors of any tier.
- F. Equipment, other than hand tools, utilized by Contractor and Subcontractors.

1.18 PERIODIC VERIFIED REPORTS

Contractor shall complete and verify construction reports on a form prescribed by the Division of the State Architect and file reports on the first day of February, May, August, and November during the preceding quarter year; at the completion of the Contract; at the completion of the Work; at the suspension of Work for a period of more than one (1) month; whenever the services of Contractor or any of Contractor's Subcontractors are terminated for any reason; and at any time a special verified report is required by the Division of the State Architect. Refer to section 4-336 and section 4-343 of Part 1, Title 24 of the California Code of Regulations.

PART 2 – PRODUCTS Not Used.

PART 3 - EXECUTION Not Used.

END OF DOCUMENT

SUBMITTALS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Contractor's Submittals and Schedules, Drawings and Specifications;
- B. Special Conditions.

1.02 SECTION INCLUDES:

- A. Definitions:
 - (1) Shop Drawings and Product Data are as indicated in the General Conditions and include, but are not limited to, fabrication, erection, layout and setting drawings, formwork and falsework drawings, manufacturers' standard drawings, descriptive literature, catalogues, brochures, performance and test data, wiring and control diagrams. In addition, there are other drawings and descriptive data pertaining to materials, equipment, piping, duct and conduit systems, and methods of construction as may be required to show that the materials, equipment or systems and all positions conform to the requirement of the Contract Documents, including, without limitation, the Drawings.
 - (2) "Manufactured" applies to standard units usually mass-produced; "fabricated" means specifically assembled or made out of selected materials to meet design requirements. Shop Drawings shall establish the actual detail of manufactured or fabricated items, indicated proper relation to adjoining work and amplify design details of mechanical and electrical equipment in proper relation to physical spaces in the structure.
 - (3) Manufacturer's Instructions: Where any item of Work is required by the Contract Documents to be furnished, installed, or performed, at a minimum, in accordance with a specified product manufacturer's instructions, the Contractor shall procure and distribute copies of these to the District, the Architect, and all other concerned parties and shall furnish, install, or perform the work, at a minimum, in accordance with those instructions.
- B. Samples, Shop Drawings, Product Data, and other items as specified, in accordance with the following requirements:
 - (1) Contractor shall submit all Shop Drawings, Product Data, and Samples to the District, the Architect, the Project Inspector, and the Construction Manager.

Contractor to review section
01 3300 as well as this
document

- (2) Contractor shall comply with all time frames herein and in the General Conditions and, in any case, shall submit required information in sufficient time to permit proper consideration and action before ordering any materials or items represented by such Shop Drawings, Product Data, and/or Samples.
- (3) Contractor shall allow sufficient time so that no delay occurs due to required lead time in ordering or delivery of any item to the Site. Contractor shall be responsible for any delay in progress of Work due to its failure to observe these requirements.
- (4) Time for completion of Work shall not be extended on account of Contractor's failure to promptly submit Shop Drawings, Product Data, and/or Samples.
- (5) Reference numbers on Shop Drawings shall have Architectural and/or Engineering Contract Drawings reference numbers for details, sections, and "cuts" shown on Shop Drawings. These reference numbers shall be in addition to any numbering system that Contractor chooses to use or has adopted as standard.
- (6) When the magnitude or complexity of submittal material prevents a complete review within the stated time frame, Contractor shall make this submittal in increments to avoid extended delays.
- (7) Contractor shall certify on submittals for review that submittals conform to Contract requirements. Also certify that Contractor-furnished equipment can be installed in allocated space. In event of any variance, Contractor shall specifically state in transmittal and on Shop Drawings, portions vary and require approval of a substitute. Submittals shall not be used as a means of requesting a substitution.
- (8) Unless specified otherwise, sampling, preparation of samples, and tests shall be in accordance with the latest standard of the American Society for Testing and Materials.
- (9) Upon demand by Architect or District, Contractor shall submit samples of materials and/or articles for tests or examinations and consideration before Contractor incorporates same in Work. Contractor shall be solely responsible for delays due to sample(s) not being submitted in time to allow for tests. Acceptance or rejection will be expressed in writing. Work shall be equal to approved samples in every respect. Samples that are of value after testing will remain the property of Contractor.

C. Submittal Schedule:

- (1) Contractor shall prepare its proposed submittal schedule that is coordinated with the proposed construction schedule and submit both to the District within ten (10) days after the date of the Notice to Proceed. Contractor's proposed schedules shall become the Project Construction Schedule and the Project Submittal Schedule after each is approved by the District.

Contractor to review section
01 3300 as well as this
document

- (2) Contractor is responsible for all lost time should the initial submittal be rejected, marked "revise and resubmit", etc.
- (3) All Submittals shall be forwarded to the District by the date indicated on the approved Submittal Schedule, unless an earlier date is necessary to maintain the Construction Schedule, in which case those Submittals shall be forwarded to the District so as not to delay the Construction Schedule.
- (4) Contractor may be assessed \$100 a day for each day it is late in submitting a shop drawing or sample. No extensions of time will be granted to Trade Contractor or any Subcontractor because of its failure to have shop drawings and samples submitted in accordance with the Schedule.

1.03 SHOP DRAWINGS:

- A. Contractor shall submit one reproducible transparency and six (6) opaque reproductions. The District will review and return the reproducible copy and one (1) opaque reproduction to Contractor.
- B. Before commencing installation of any Work, the Contractor shall submit and receive approval of all drawings, descriptive data, and material list(s) as required to accomplish Work.
- C. Review of Shop Drawings is regarded as a service to assist Contractor and in all cases original Contract Documents shall take precedence as outlined under General Conditions.
- D. No claim for extra time or payment shall be based on work shown on Shop Drawings unless the claim is (1) noted on Contractor's transmittal letter accompanying Shop Drawings and (2) Contractor has complied with all applicable provisions of the General Conditions, including, without limitation, provisions regarding changes and payment, and all required written approvals.
- E. District shall not review Shop Drawings for quantities of materials or number of items supplied.
- F. District's and/or Architect's review of Shop Drawing will be general. District and/or Architect review does not relieve Contractor of responsibility for dimensions, accuracy, proper fitting, construction of Work, furnishing of materials, or Work required by Contract Documents and not indicated on Shop Drawings. The District's and/or Architect's review of Shop Drawings is not to be construed as approving departures from Contract Documents.
- G. Review of Shop Drawings and Schedules does not relieve Contractor from responsibility for any aspect of those Drawings or Schedules that is a violation of local, County, State, or Federal laws, rules, ordinances, or rules and regulations of commissions, boards, or other authorities or utilities having jurisdiction.
- H. Before submitting Shop Drawings for review, Contractor shall check Shop Drawings of its subcontractors for accuracy, and confirm that all Work

Contractor to review section
01 3300 as well as this
document

contiguous with and having bearing on other work shown on Shop Drawings is accurately drawn and in conformance with Contract Documents.

- I. Submitted drawings and details must bear stamp of approval of Contractor:
 - (1) Stamp and signature shall clearly certify that Contractor has checked Shop Drawings for compliance with Drawings.
 - (2) If Contractor submits a Shop Drawing without an executed stamp of approval, or whenever it is evident (despite stamp) that Drawings have not been checked, the District and/or Architect will not consider them and will return them to the Contractor for revision and resubmission. In that event, it will be deemed that Contractor has not complied with this provision and Contractor shall bear risk of all delays to same extent as if it had not submitted any Shop Drawings or details.
- J. Submission of Shop Drawings (in either original submission or when resubmitted with correction) constitutes evidence that Contractor has checked all information thereon and that it accepts and is willing to perform Work as shown.
- K. Contractor shall pay for cost of any changes in construction due to improper checking and coordination. Contractor shall be responsible for all additional costs, including coordination. Contractor shall be responsible for costs incurred by itself, the District, the Architect, the Project Inspector, the Construction Manager, any other Subcontractor or contractor, etc., due to improperly checked and/or coordination of submittals.
- L. Shop Drawings must clearly delineate the following information:
 - (1) Project name and address.
 - (2) Specification number and description.
 - (3) Architect's name and project number.
 - (4) Shop Drawing title, number, date, and scale.
 - (5) Names of Contractor, Subcontractor(s) and fabricator.
 - (6) Working and erection dimensions.
 - (7) Arrangements and sectional views.
 - (8) Necessary details, including complete information for making connections with other Work.
 - (9) Kinds of materials and finishes.
 - (10) Descriptive names of materials and equipment, classified item numbers, and locations at which materials or equipment are to be installed in the Work. Contractor shall use same reference identification(s) as shown on Contract Drawings.

Contractor to review section
01 3300 as well as this
document

- M. Contractor shall prepare composite drawings and installation layouts when required to solve tight field conditions.
 - (1) Shop Drawings shall consist of dimensioned plans and elevations and must give complete information, particularly as to size and location of sleeves, inserts, attachments, openings, conduits, ducts, boxes, structural interferences, etc.
 - (2) Contractor shall coordinate these composite Shop Drawings and installation layouts in the field between itself and its Subcontractor(s) for proper relationship to the Work, the work of other trades, and the field conditions. The Contractor shall check and approve all submittal(s) before submitting them for final review.

1.04 PRODUCT DATA OR NON REPRODUCIBLE SUBMITTALS:

- A. Contractor shall submit manufacturer's printed literature in original form. Any fading type of reproduction will not be accepted. Contractor must submit a minimum of six (6) each, to the District. District shall return one (1) to the Contractor, who shall reproduce whatever additional copies it requires for distribution.
- B. Contractor shall submit six (6) copies of a complete list of all major items of mechanical, plumbing, and electrical equipment and materials in accordance with the approved Submittal Schedule, except as required earlier to comply with the approved Construction Schedule. Other items specified are to be submitted prior to commencing Work. Contractor shall submit items of like kind at one time in a neat and orderly manner. Partial lists will not be acceptable.
- C. Submittals shall include manufacturer's specifications, physical dimensions, and ratings of all equipment. Contractor shall furnish performance curves for all pumps and fans. Where printed literature describes items in addition to that item being submitted, submitted item shall be clearly marked on sheet and superfluous information shall be crossed out. If highlighting is used, Contractor shall mark all copies.
- D. Equipment submittals shall be complete and include space requirements, weight, electrical and mechanical requirements, performance data, and supplemental information that may be requested.
- E. Imported Materials Certification must be submitted at least ten (10) days before material is delivered.

1.05 SAMPLES:

- A. Contractor shall submit for approval Samples as required and within the time frame in the Contract Documents. Materials such as concrete, mortar, etc., which require on-site testing will be obtained from Project Site.
- B. Contractor shall submit four (4) samples except where greater or lesser number is specifically required by Contract Documents including, without limitation, the Specifications.

Contractor to review section
01 3300 as well as this
document

- (1) Samples must be of sufficient size and quality to clearly illustrate functional characteristics, with integrally related parts and attachment devices.
 - (2) Samples must show full range of texture, color, and pattern.
- C. Contractor shall make all Submittals, unless it has authorized Subcontractor(s) to submit and Contractor has notified the District in writing to this effect.
- D. Samples to be shipped prepaid or hand-delivered to the District.
- E. Contractor shall mark samples to show name of Project, name of Contractor submitting, Contract number and segment of Work where representative Sample will be used, all applicable Specifications Sections and documents, Contract Drawing Number and detail, and ASTM or FS reference, if applicable.
- F. Contractor shall not deliver any material to Site prior to receipt of District's and/or Architect's completed written review and approval. Contractor shall furnish materials equal in every respect to approved Samples and execute Work in conformance therewith.
- G. District's and/or Architect's review, acceptance, and/or approval of Sample(s) will not preclude rejections of any material upon discovery of defects in same prior to final acceptance of completed Work.
- H. After a material has been approved, no change in brand or make will be permitted.
- I. Contractor shall prepare its Submittal Schedule and submit Samples of materials requiring laboratory tests to specified laboratory for testing not less than ninety (90) days before such materials are required to be used in Work.
- J. Samples which are rejected must be resubmitted promptly after notification of rejection and be marked "Resubmitted Sample" in addition to other information required.
- K. Field Samples and Mock-Ups are to be removed by Contractor at District's direction:
 - (1) Size: As Specified.
 - (2) Furnish catalog numbers and similar data, as requested.

1.06 REVIEW AND RESUBMISSION REQUIREMENTS:

- A. The District will arrange for review of Sample(s), Shop Drawing(s), Product Data, and other submittal(s) by appropriate reviewer and return to Contractor as provided below within twenty-one (21) days after receipt or within twenty-one (21) days after receipt of all related information necessary for such review, whichever is later.
- B. One (1) copy of product or materials data will be returned to Contractor with the review status.

Contractor to review section
01 3300 as well as this
document

- C. Samples to be incorporated into the Work will be returned to Contractor, together with a written notice designating the Sample with the appropriate review status and indicating errors discovered on review, if any. Other Samples will not be returned, but the same notice will be given with respect thereto, and that notice shall be considered a return of the Sample.
- D. Contractor shall revise and resubmit any Sample(s), Shop Drawing(s), Product Data, and other submittal(s) as required by the reviewer. Such resubmittals will be reviewed and returned in the same manner as original Sample(s), Shop Drawing(s), Product Data, and other submittal(s), within fourteen (14) days after receipt thereof or within fourteen (14) days after receipt of all related information necessary for such review. Such resubmittal shall not delay the Work.
- E. Contractor may proceed with any of the Work covered by Sample(s), Shop Drawing(s), Product Data, and other submittal(s) upon its return if designated as no exception taken, or revise as noted, provided the Contractor proceeds in accordance with the District and/or the Architect's notes and comments.
- F. Contractor shall not begin any of the work covered by a Sample(s), Shop Drawing(s), Product Data, and other submittal(s), designated as revise and resubmit or rejected, until a revision or correction thereof has been reviewed and returned to Contractor.
- G. Sample(s), Shop Drawing(s), Product Data, and other submittal(s) designated as revise and resubmit or rejected and requiring resubmittal, shall be revised or corrected and resubmitted to the District no later than fourteen (14) days or a shorter period as required to comply with the approved Construction Schedule, after its return to Contractor.
- H. Neither the review nor the lack of review of any Sample(s), Shop Drawing(s), Product Data, and other submittal(s) shall waive any of the requirements of the Contract Documents, or relieve Contractor of any obligation thereunder.
- I. District's and/or Architect's review of Shop Drawings does not relieve the Contractor of responsibility for any errors that may exist. Contractor is responsible for the dimensions and design of adequate connections and details and for satisfactory construction of all the Work.

PART 2 – PRODUCTS Not Used.

PART 3 - EXECUTION Not Used.

END OF DOCUMENT

Wanda Hirsch Elementary School Shade Structures
Tracy Unified School District

SUBMITTAL NO.:

Architect's Project # 3595001

DATE: _____

DSA File/Apl. # XX-XX/XX-XXXXXX

Re-Submittal of Original No.: _____

1. SUBMITTAL TRANSMITTAL

Attention: Affifa Kadhim

Contractor: Company

Contact: Name _____

Sub Contractor:

Contact: _____

HMC
Architects

Please submit only one trade per submittal! Description of submitted materials:

Quantity submitted	Specification Section		Description of contents (e.g. product data, shop drawings, samples)
	Section #	Section Title	

Contractor Statement: (read and acknowledge)

This submittal has been reviewed and approved with respect to the means, methods, techniques, and procedures of construction, safety precautions, and program incidentals thereto. This submittal complies with the contract documents and comprises no variations thereto, unless accompanied by a substitution request.

By: _____
Name

Date: _____

2. RE-TRANSMITTAL TO CONTRACTOR:

Distribution: Contractor, Owner, Project Inspector, HMC, Other

- | | | |
|--|--|---|
| <input type="checkbox"/> NO EXCEPTIONS TAKEN | <input type="checkbox"/> REJECTED | <input type="checkbox"/> FURNISH AS CORRECTED |
| <input type="checkbox"/> SUBMIT SPECIFIED ITEM | <input type="checkbox"/> REVISE AND RESUBMIT | <input type="checkbox"/> NO ACTION REQUIRED |

Corrections or comments made on the shop drawings during this review do not relieve the Contractor from compliance with requirements of the Drawings and Specifications. This general check is only for the review of conformance with the design concept of the project and general compliance with the information given in the Contract Documents. The Contractor is responsible for confirming and correlating all quantities and dimensions, selecting fabrication processes and techniques of construction, coordinating his work with that of all the other trades, and performing his work in a safe and satisfactory manner.

HMC ARCHITECTS

By: _____ Date: _____

Additional Comments:

See Specification Section 01 3300 for use of this form

Wanda Hirsch Elementary School Shade Structures
Tracy Unified School District

**SUBSTITUTION
REQUEST NO.:**

Architect's Project # 3595001
DSA File/Appl. # XX-XX/XX-XXXXXX

Date: _____

1. SUBSTITUTION REQUEST

Attention: Affifa Kadhim

Contractor: Company _____

Contact: Name _____

HMC
Architects

Please submit only one product per request!

Sub Contractor: _____

Include with a specified product Submittal

Contact: _____

2. PROPOSED SUBSTITUTIONS: The undersigned requests consideration of the following substitution:

Specified Item: _____ Page No.: _____ Paragraph No.: _____

Proposed Item: _____

3. REASON FOR REQUEST:

4. REQUIREMENTS FOR SUBSTITUTIONS:

Attached data includes product description, specifications, drawings, photographs, performance and test data adequate for evaluation of request; applicable portions of data are clearly identified. Attached data also includes a description of changes to Contract Documents, which proposed substitution will require for its proper installation.

The undersigned certifies that the following paragraphs, unless modified by attachments, are correct:

1. The proposed substitution does not affect dimensions shown on drawings and does not require design changes in the Contract Documents.
2. The undersigned will pay for changes to the building design, including engineering design, detailing and construction costs caused by the requested substitution.
3. The proposed substitution will have no adverse effect on the work, the schedule or specified warranty requirements.
4. Maintenance and service parts will be readily available for the proposed substitution.

The undersigned further states that the function, appearance and quality of the proposed substitution are equivalent or superior to the specified item.

Signature - Contractor/Subcontractor

Date

5. TRANSMITTAL TO CONTRACTOR:

Distribution: Contractor, Owner, Project Inspector, RGA, Other

☐ **ACCEPTED**

☐ **ACCEPTED AS NOTED**

☐ **REJECTED**

HMC ARCHITECTS

By: _____

Date: _____

Comments:

Wanda Hirsch Elementary School Shade Structures
Tracy Unified School District

RFI NO.:

Architect's Project # 3595001
DSA File/Apl. # XX-XX/XX-XXXXXX

Date: _____

1. REQUEST FOR INFORMATION

Attention: Affifa Kadhim

From:

Contractor:

Company

Contact:

Name

Sub Contractor:

Contact:

HMC
Architects

Identify related specific references within the Contract Documents and supporting information:

Dwg./Document No.: _____

Building/Site Location: _____

2. Existing Condition (source / reason for the request):

3. Recommended Contractor Action(s) for resolution:

4. Project Inspector Acknowledgment:

Date Reviewed: _____

5. Owner / A/E Resolution(s):

Date of Response: _____ By: _____

Attachments: _____

Extra Work Involved in the Above Described Change?

Yes ☐

No ☐

Distribution: Contractor, Owner, Project Inspector, HMC, Other
See Specification Section 01300 for use of this form

HMC, Other

Wanda Hirsch Elementary School Shade Structures
Tracy Unified School District

**E-DATA
REQUEST NO.:**

Architect's Project # 3595001
DSA File/Appl. # XX-XX/XX-XXXXXX

Date: _____

1. ELECTRONIC DATA REQUEST

Attention: Affifa Kadhim

From: Contractor: Company

Contact: Name

HMC
Architects

Sub Contractor:

Contact: _____

2. DATA REQUESTED - Provide list of specific drawings requested (include sheet numbers):

3. REASON FOR REQUEST - Provide clear explanation of why information is desired and for what purpose it will be utilized:

4. ACKNOWLEDGEMENT OF RESPONSIBILITY:

The electronic data files requested are distributed for reference only. Transferring such files can alter, delete or change original information. Accuracy of the data cannot be guaranteed as correct or complete and the Contractor accepts full responsibility for any and all inaccuracies, regardless of cause.

The hard copy documents, including addenda and subsequent written changes to the documents, represent the complete work of the contract and all electronic files should be cross-referenced and verified from that information as electronic files may not contain all contract information. It is the Contractor's responsibility to make any changes or revisions necessary.

This electronic data is furnished without guarantee of compatibility with your hardware or software. It is the Contractor's responsibility to notify the Architect in the event a compatibility problem or disk defect is encountered and a replacement disk is necessary.

This electronic data, in its present form, remains the property of HMC Architects and shall not be used for any other purpose than to provide background information for the project noted above. It is not to be released to any other party without the written consent of HMC Architects.

Accepted by: _____
Signature - Contractor/Subcontractor

Representing: _____
Contractor/Subcontractor Company Name

CERTIFICATION OF COMPLIANCE FOR BUILDING MATERIALS

This is to certify, in accordance with the Environmental Protection Agency requirements, that the materials and equipment used in the construction of the [project name] for the [district name] School District of [name of county] County, California, are asbestos free and are, therefore, not subject to monitoring for asbestos contamination.

Project Name: _____

Address: _____

Contractor: _____

Address: _____

Signature: _____

Title: _____

Date: _____

SEPARATE CERTIFICATE IS REQUIRED FOR EACH SITE

ROOFING CERTIFICATION

This is to certify that a representative of the manufacturer has visited the site prior to installation, inspected the surfaces which the roofing is applied and accepted those surfaces.

In addition, a representative of the manufacturer has inspected the materials and methods used, verified they are in accordance with the manufacturer's recommendations, and accepts the final installation.

A guarantee for materials and workmanship is to be provided separately.

Project name: _____

Address: _____

General Contractor: _____

Roofing Contractor: _____

Scope of Work/Roofing Type: _____

Roofing Manufacturer: _____

Manufacturer's Representative: _____

Representative's Signature: _____

Date: _____

A SEPARATE CERTIFICATE IS REQUIRED FOR EACH SITE
AND FOR EACH ROOFING TYPE

SITE STANDARDS

PART 1 – GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including without limitation, Site Access, Conditions, and Regulations;
- B. Special Conditions;
- C. Drug-Free Workplace Certification;
- D. Tobacco-Free Environment Certification;
- E. Criminal Background Investigation/Fingerprinting Certification;
- F. Temporary Facilities and Controls.

1.02 REQUIREMENTS OF THE DISTRICT:

- A. Drug-Free Schools and Safety Requirements:
 - (1) All school sites and other District Facilities have been declared "Drug-Free Zones." No drugs, alcohol and/or smoking are allowed at any time in any buildings and/or grounds on District property. No students, staff, visitors, or contractors are to use drugs on these sites.
 - (2) Smoking and the use of tobacco products by all persons is prohibited on or in District property. District property includes school buildings, school grounds, school-owned vehicles and vehicles owned by others while on District property. Contractor shall post: "Non-Smoking Area" in a highly visible location in each work area, staging area, and parking area. Contractor may designate a smoking area outside of District property within the public right-of-way, provided that this area remains quiet and unobtrusive to adjacent neighbors. This smoking area is to be kept clean at all times.
 - (3) Contractor shall ensure that no alcohol, firearms, weapons, or controlled substances enter or are used at the Site. Contractor shall immediately remove from the Site and terminate the employment of any employee(s) found in violation of this provision.
- B. Language: Profanity or other unacceptable and/or loud language will not be tolerated, "Cat calls" or other derogatory language toward students, staff, volunteers, parents or public will not be allowed.

C. Disturbing the Peace (Noise and Lighting):

- (1) Contractor shall observe the noise ordinance of the Site at all times including, without limitation, all applicable local, city, and/or state laws, ordinances, and/or regulations regarding noise and allowable noise levels.
- (2) The use of radios, etc., shall be controlled to keep all sound at a level that cannot be heard beyond the immediate area of use. District reserves the right to prohibit the use of radios at the Site, except for mobile phones or other handheld communication radios.
- (3) If portable lights are used after dark, all light must be located so as not to direct light into neighboring property.

D. Traffic:

- (1) Driving on the Premises shall be limited to periods when students and public are not present. If driving or deliveries must be made during the school hours, two (2) or more ground guides shall lead the vehicle across the area of travel. In no case shall driving take place across playgrounds or other pedestrian paths during recess, lunch, and/or class period changes. The speed limit on-the Premises shall be five (5) miles per hour (maximum) or less if conditions require.
- (2) All paths of travel for deliveries, including without limitation, material, equipment, and supply deliveries, shall be reviewed and approved by District in advance. Any damage will be repaired to the pre-damaged condition by the Contractor.
- (3) District shall designate a construction entry to the Site. If Contractor requests, District determines it is required, and to the extent possible, District shall designate a staging area so as not to interfere with the normal functioning of school facilities. Location of gates and fencing shall be approved in advance with District and at Contractor's expense.
- (4) Parking areas shall be reviewed and approved by District in advance. No parking is to occur under the drip line of trees or in softscape areas that could otherwise be damaged.

- E. All of the above shall be observed and complied with by the Contractor and all workers on the Site. Failure to follow these directives could result in individual(s) being suspended or removed from the work force at the discretion of the District. The same rules and regulations shall apply equally to delivery personnel, inspectors, consultants, and other visitors to the Site.

PART 2 - PRODUCTS Not Used.

PART 3 - EXECUTION Not Used.

END OF DOCUMENT

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Alteration requirements for modernizations, remodels, and additions.

1.2 RELATED REQUIREMENTS

- A. Section 01 1100, Summary of Work.
- B. Section 01 5000, Temporary Facilities and Controls.
- C. Section 01 7329, Cutting and Patching.

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CALGreen), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Coordination:
 - 1. Contractor to coordinate and conduct a meeting with the demolition contractor to verify which systems, if any, are to be protected and maintained. Such systems shall be clearly identified and marked to avoid unnecessary damage or removal.
 - 2. Coordinate work of alterations and renovations to expedite completion sequentially and to accommodate Owner occupancy.

1.5 QUALITY ASSURANCE

- A. Manufacturer and Installer Qualifications: As specified in the product specifications.
- B. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.
- C. Single Source Responsibility: Use materials and products of one manufacturer whenever possible.
- D. All materials, components, assemblies, workmanship and installation are to be observed by the Owner's Inspector of Record. Work not so inspected is subject to uncovering and replacement.

ALTERATION PROJECT PROCEDURES
SECTION 01 3516
3595001

1.6 FIELD CONDITIONS

- A. Make and be responsible for all field dimensions necessary for proper fitting and completion of work. Report discrepancies to Architect before proceeding.

PART 2 - PRODUCTS

2.1 PRODUCTS FOR PATCHING AND EXTENDING WORK

- A. New Materials: As specified in product Sections; match existing products and work for patching and extending work.
- B. Type and Quality of Existing Products: Determine by inspection and testing products where necessary, referring to existing work as a standard.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that demolition is complete and areas are ready for installation of new work.
- B. Inspect conditions of uncovered work affecting installation of products or performance work.
- C. Verify that specified items may be installed in accordance with the approved design.
- D. Beginning of restoration work means acceptance of existing conditions.
- E. In event of discrepancy, immediately notify Architect. Do not proceed in discrepant areas until discrepancies have been fully resolved.

3.2 PREPARATION

- A. Close openings in exterior surfaces to protect existing work and salvage items for weather and extremes of temperature and humidity. Insulate ductwork and piping to prevent condensation in exposed areas.
- B. Cut, move or remove items as necessary for access to alterations and renovation work.
- C. Remove debris and abandoned items from area and from concealed spaces.
- D. Remove unsuitable material not marked for salvage, such as rotted wood, corroded metals, and deteriorated masonry and concrete.
- E. Prepare surface, and remove surface finishes to provide for proper installation of new work and finishes including blocking, framing, insulation, etc.
- F. Replace materials as specified for finished work.

3.3 INSTALLATION

- A. Complete Project in all respects.
- B. Remove, cut and patch work in a manner to minimize damage and to provide a means of restoring products and finishes to original condition, and installation of concealed work, as specified in Section 01 7329, Cutting and Patching,
- C. Install products as specified in individual specifications Sections.
- D. Where materials or equipment are removed, but no new finish is scheduled, patch and repair any damage to match existing wall surface.

3.4 TRANSITIONS

- A. Where new work abuts or aligns with existing, perform a smooth and even transition. Patched work is to match existing adjacent work in texture and appearance.
- B. When finished surfaces are cut so that a smooth transition with new work is not possible, terminate existing surface along a straight line at a natural point of division and make recommendation to Architect.

3.5 ADJUSTMENTS

- A. Where removal of partitions or walls results in adjacent spaces becoming one, rework floors, walls and ceilings to a smooth plane without breaks, steps or bulkheads.
- B. Where a change of plane of 1/8" or more occurs, submit recommendation for providing a smooth transition for Architect review.
- C. Fit work at penetrations of surfaces as specified in Section 01 7329.

3.6 FINISHES

- A. Finish surfaces as specified in individual Product Sections.
- B. Finish patches to produce uniform finish and texture over entire area. When finish cannot be matched, refinish entire surface to nearest intersections.

3.7 REPAIR OF DAMAGED SURFACES

- A. Patch or replace portions of existing surfaces which are damaged, lifted, discolored, or showing other imperfections.
- B. Repair substrate prior to patching finish.
- C. In the event of damage, make all repairs and replacements necessary to the approval of the Architect at no additional cost to the Owner.

ALTERATION PROJECT PROCEDURES
SECTION 01 3516
3595001

3.8 CLEANING

- A. Upon completion of installation, remove manufacturer's temporary labels and marks of identification. Thoroughly clean surfaces and remove foreign material. Leave entire work in neat, orderly, clean and acceptable condition.

3.9 PROTECTION

- A. Protect work and materials of this Section prior to and during installation, and protect the installed work and materials of other trades.
- B. Exposed finishes shall be free from scratches, dents, permanent discolorations and other defects in workmanship or material.

END OF SECTION

*p:\sacramento\3595 tracy unified school district\001-000_villalovoz es new shade structures\08 specifications\06 spec\04 final\freiler
- shade struct\01 3516 _alteration project procedures.docx
Last Updated: December 16, 2021*

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Special environmental, sustainable, and “green” building practices related to indoor air quality, resource efficiency supplementing the Pollutant Control requirements specified under Section 01 8113.10, Sustainable Design Requirements, and to ensure healthy indoor air quality in final Project.
- B. Contractor is required to comply with sustainable building practices during construction and when considering materials for substitutions. Refer to Article “Design Requirements.”

1.2 RELATED REQUIREMENTS

- A. Section 01 6116, Volatile Organic Compound (VOC) Restrictions.
- B. Section 01 7419, Construction Waste Management and Disposal.
- C. Section 01 8113, Sustainable Design Requirements.

1.3 ADMINISTRATIVE REQUIREMENTS

- A. Submittal Procedures:
 - 1. Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
 - 2. Sustainable Design Submittals shall comply with the additional requirement of Section 01 8113, Sustainable Design Requirements.
 - 3. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.

1.4 DESIGN REQUIREMENTS

- A. Owner has established general environmental goals for design and for construction of the Project.
 - 1. In addition to the Contractor, the Contractor’s construction team, including subcontractors, suppliers, and manufacturers, are encouraged to participate where possible to realize the Owner’s environmental goals.
 - 2. Intent is for environmental goals to be achieved in a manner which ultimately provides a safe and healthy environment for building occupants with minimal impact on the local, regional and global environment.
- B. Environmental Goals:
 - 1. Refer to specific Specifications Sections for more detailed construction requirements related to specific materials and systems.

ENVIRONMENTAL PROCEDURES
SECTION 01 3543
3595001

1.5 INFORMATIONAL SUBMITTALS

A. Indoor Air Quality (IAQ) Data:

1. Environmental Issues: Submit emission test data produced by acceptable testing laboratory, listed in this Specification Article "Quality Assurance," for materials as required in each specific Specification Section.
 - a. Laboratory reports shall contain emissions test data on Volatile Organic Compounds (VOCs) including Total Volatile Organic Compounds (TVOC), specific individual VOCs, formaldehyde and other aldehydes as described in this Section.
 - b. Identify VOCs emitted by each material as required in these Specifications, and demonstrate compliance with the California Green Building Standards Code, edition current as of the date of this Contract.
 - c. Specific test conditions and requirements are set forth in the Specifications. For required tests, submit documentation of sample acquisition, handling, and test specimen preparation, as well as test conditions, methods, and procedures. The tests consist of a 10-day conditioning period followed by a 96-hour test period.
 - 1) Samples collected during the test period at 24, 48, and 96-hours shall be analyzed for TVOC and formaldehyde.
 - 2) VOC samples collected at 96 hours shall be identified and quantified for compounds that are found on the list of Chemicals of Concern. The Chemicals of Concern list is based on the California OEHHA list as of September 2002 (The most recent list shall be used for this Specification as published at:
 - a) http://www.oehha.org/air/chronic_rels/allChrels.html.
2. Cleaning and Maintenance Products: Provide data on manufacturers' recommended maintenance, cleaning, refinishing and disposal procedures for materials and products. These procedures are for final Contractor cleaning of the project prior to Substantial Completion and for provided materials and products as required by the specific Specification Sections.
 - a. Where chemical products are recommended for these procedures, provide documentation to indicate that no component present in the cleaning product at more than 1 percent of the total mass of the cleaning product is a carcinogen or reproductive toxicant as identified in the Chemicals of Concern list referenced above.
 - b. Avoid cleaning products containing alpha-pinene, d-limonene or other unsaturated carbon double bond alkenes due to chemical reactions with ozone to form aldehydes, acidic aerosols, and ultra-fine particulate matter in indoor air.

B. Certificates:

1. Prior to Final Completion, submit a certificate signed by corporate office holder of Contractor, subcontractor, supplier, vendor, installer or manufacturer primarily responsible for the manufacturing of the product, indicating materials provided are

essentially the same, and contain essentially the same components as products and materials tested.

2. Comply with requirements specified in Specification Section 01 7700, Closeout Procedures.

1.6 CLOSEOUT SUBMITTALS

- A. Submit data relating to Environmental Issues.
 1. Submit environmental product certifications, in two forms:
 - a. Two CD-ROMs organized by CSI Division Format.
 - b. Three three-ring binders organized by CSI Division Format with Table of Contents and with dividers for each Division.

1.7 QUALITY ASSURANCE

- A. Environmental Project Management and Coordination: Contractor to identify one person on Contractor's staff to be responsible for environmental issues compliance and coordination.
 1. Experience: Environmental project manager shall have experience relating to sustainable building construction.
 2. Responsibilities: Carefully review the Contract Documents for environmental issues, coordinate work of trades, subcontractors, and suppliers; instruct workers relating to environmental issues; and oversee Project Environmental Goals.
 3. Meetings: Discuss Environmental Goals at following meetings.
 - a. Pre-construction meeting.
 - b. Pre-installation meetings.
 - c. Regularly scheduled job-site meetings.
 - d. Special sustainability issues meetings.
- B. Environmental Issues Criteria: Comply with requirements listed in the Specification Sections.
- C. Acceptable Indoor Air Emissions Testing Laboratories:
 1. Selection of testing laboratories shall include assessment of prior experience in conducting indoor source emissions tests.
 2. The proposed laboratory shall be an independent company or organization not related to the manufacturer of the products to be tested.
 3. Submit documentation on proposed laboratory for review and approval by Owner.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Packaging: Deliver materials in recyclable or in reusable packaging such as cardboard, wood, paper, or reusable blankets, which will be reclaimed by supplier or manufacturer for recycling.

ENVIRONMENTAL PROCEDURES

SECTION 01 3543

3595001

1. Minimize packaging materials to maximum extent possible while still ensuring protection of materials during delivery, storage, and handling.
 2. Unacceptable Packaging Materials: Polyurethane, polyisocyanate, polystyrene, polyethylene, and similar plastic materials such as “foam” plastics and “shrink-fit” plastics.
 3. Reusable Blankets: Deliver and store materials in reusable blankets and mats reclaimed by the manufacturers or suppliers for reuse where the reclamation program exists or where a program can be developed for such reuse.
 4. Pallets: Where pallets are used, suppliers shall be responsible to ensure pallets are removed from site for reuse or for recycling.
 5. Corrugated Cardboard and Paper: Where paper products are used, recycle as part of the construction waste management recycling program, or return to the material’s manufacturer for use by the manufacturer or supplier.
 6. Sealants, Paint, Primers, Adhesives, and Coating Containers: Return to the supplier or manufacturer for reuse where such program is available.
- B. Comply with the additional requirements specified in Section 01 7419, Construction Waste Management and Disposal.

1.9 FIELD CONDITIONS

- A. No smoking will be permitted in indoor Project site locations, in accordance with California Labor Code (Section 400-6413.5).
- B. Environmental Product Certification:
1. Include certification that indicates cleaning materials comply with requirements of these Specifications.
- C. Construction Ventilation and Preconditioning:
1. Temporary Construction Ventilation: Maintain sufficient temporary ventilation of areas where materials are being used that emit VOCs. Maintain ventilation continuously during installation, and until emissions dissipate following installation. If continuous ventilation is not possible utilizing the building’s HVAC system(s) then ventilation shall be supplied using open windows and temporary fans, sufficient to provide no less than three air changes per hour.
 - a. Period after installation shall be sufficient to dissipate odors and elevated concentrations of VOCs. Where no specific period is stated in these Specifications, a time period of 72 hours shall be used.
 - b. Ventilate areas directly to outside; ventilation to other enclosed areas is not acceptable.
 2. During dust producing activities, including drywall installation and finishing, turn ventilation system off, and openings in supply and return HVAC system shall be protected from dust infiltration. Provide temporary ventilation as required.
 3. Preconditioning: Prior to installation, allow products which have odors and significant VOC emissions to off-gas in dry, well-ventilated space for 14 calendar days to allow for reasonable dissipation of odors and emissions prior to delivery to Project site and installation.

- a. Condition products without containers and packaging to maximize off-gassing of VOCs
 - b. Condition products in ventilated warehouse or other building. Comply with substitution requirements for consideration of other locations.
- D. Protection:
 - 1. Moisture Stains: Materials with evidence of moisture damage, including stains, are not acceptable, including both stored and installed materials; immediately remove from site and properly dispose.
 - a. Take special care to prevent an accumulation of moisture on installed materials and within packaging during delivery, storage, and handling to prevent development of molds and mildew on packaging and on products
 - b. Immediately remove from site and properly dispose of materials showing signs of mold and signs of mildew, including materials with moisture stains.
 - c. Replace moldy materials with new, undamaged materials.
 - 2. Ducts: Seal ducts during transportation, delivery, and construction to prevent accumulation of construction dust and construction debris inside of ducts.

PART 2 - PRODUCTS

2.1 SUBSTITUTIONS

- A. Requests for substitutions shall comply with requirements specified in Specification Section 01 3300, Submittals, and with the following additional information required where environmental issues are specified:
 - 1. Indicate how each proposed substitution complies with requirements for VOCs.
 - 2. Owner, in consultation with Architect reserve the right to reject proposed substitutions where data for VOCs is not provided or where emissions of individual VOCs are higher than for the specified materials.
 - 3. Comply with the specified recycled content and other environmental requirements.

PART 3 - EXECUTION

3.1 FIELD QUALITY CONTROL

- A. Sequencing:
 - 1. On-Site Application: Where odorous and/or high VOC emitting products are applied on-site, apply prior to installation of porous and fibrous materials. Where this is not possible, protect porous materials with polyethylene vapor retarders.
 - 2. Complete interior finish material installation no less than 14 days prior to Substantial Completion to allow for Building Flush Out as described in Paragraph 3.1B.

ENVIRONMENTAL PROCEDURES

SECTION 01 3543

3595001

- B. Building Flush Out: Just prior to Substantial Completion, flush out building air continuously using maximum tempered outside air, or maximum amount of outside air while achieving reasonable indoor temperature, for at least 14 calendar days. Continuously is defined as 24 hours per day, 7 days a week. If interruptions of more than a few hours are required for testing and balancing purposes, extend flush out period accordingly in order to achieve the minimum 14 calendar day building flush out period.
 - 1. When Contractor is required to perform touch-up work, provide temporary construction ventilation during installation and extend building flush-out by a minimum of 4 calendar days after touch-up installation is complete with maximum tempered outside air for 24 hours per day.
 - 2. If construction schedule permits, extend flush-out period beyond minimum building flush out period for an additional 15 days.
 - 3. Return ventilation system to normal operation following flush-out period to minimize energy consumption.

3.2 CLEANING

- A. Clean interior and exterior surfaces exposed to view; remove temporary labels, stains, and foreign substances; polish transparent and glossy surfaces using cleaning and maintenance products that conform to standards as described in Part 1 of this Section.
- B. Clean equipment and fixtures to sanitary condition using cleaning and maintenance products that conform to standards as described in Part 1 of this Section.
- C. Products used for cleaning shall comply with Proposition 65 and the additional restrictions for volatile organic compounds specified in Section 01 6116.
- D. Vacuum carpeted and soft surfaces with high efficiency particulate arrestor (HEPA) vacuum.
- E. If ducts were not sealed during construction, and contain dust or dirt, clean ducts using HEPA vacuum immediately prior to Substantial Completion and prior to using ducts to circulate air. Oil film on sheet metal shall be removed before shipment to site. Ducts shall be inspected to confirm that no oil film is present. Remove oil film.
- F. Replace air filters, both pre and final filters, just prior to Substantial Completion.
- G. Remove and properly dispose of recyclable materials using construction waste management program described in Section 01 7419, Construction Waste Management and Disposal.

3.3 PROTECTION

- A. Protect interior materials from water intrusion or penetration where interior products are not intended for wet applications and are exposed to moisture.
- B. Protect installed products using methods that do not support growth of mold and mildew.

ENVIRONMENTAL PROCEDURES
SECTION 01 3543
3595001

1. Immediately remove from site materials with mold or mildew.

END OF SECTION

*p:\sacramento\3595 tracy unified school district\001-000_villalovoz es new shade structures\08 specifications\06 spec\04 final\freiler
- shade struct\01 3543_environmental procedures.docx*

REGULATORY REQUIREMENTS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Obtaining of Permits, Licenses and Registrations and Work to Comply with All Applicable Laws and Regulations;
- B. Special Conditions; and
- C. Quality Control.

1.02 DESCRIPTION:

This section covers the general requirements for regulatory requirements pertaining to the Work and is supplementary to all other regulatory requirements mentioned or referenced elsewhere in the Contract Documents.

1.03 REQUIREMENTS OF REGULATORY AGENCIES:

- A. All statutes, ordinances, laws, rules, codes, regulations, standards, and the lawful orders of all public authorities having jurisdiction over the Work, are hereby incorporated into these Contract Documents as if repeated in full herein and are intended to be included in any reference to Code or Building Code, unless otherwise specified, including, without limitation, the references in the list below. Contractor shall make available at the Site copies of all the listed documents applicable to the Work as the District and/or Architect may request, including, without limitation, applicable portions of the California Code of Regulations ("CCR").
 - (1) California Building Standards Administrative Code, Part 1, Title 24, CCR.
 - (2) California Building Code (CBC), Part 2, Title 24, CCR; (International Building Code volumes 1-2 and California Amendments).
 - (3) California Electrical Code (CEC), Part 3, Title 24, CCR; (National Electrical Code and California Amendments).
 - (4) California Mechanical Code (CMC), Part 4, Title 24, CCR; (Uniform Mechanical Code and California Amendments).
 - (5) California Plumbing Code (CPC), Part 5, Title 24, CCR; (Uniform Plumbing Code and California Amendments).

- (6) California Fire Code (CFC), Part 9, Title 24, CCR; (International Fire Code and California Amendments).
- (7) California Green Building Standards Code (CALGreen), Part 11, Title 24, CCR.
- (8) California Referenced Standards Code, Part 12, Title 24, CCR.
- (9) State Fire Marshal Regulations, Public Safety, Title 19, CCR.
- (10) Partial List of Applicable National Fire Protection Association (NFPA) Standards:
 - (a) NFPA 13 - Automatic Sprinkler System.
 - (b) NFPA 14 - Standpipes Systems.
 - (c) NFPA 17A - Wet Chemical System
 - (d) NFPA 24 - Private Fire Mains.
 - (e) (California Amended) NFPA 72 - National Fire Alarm Codes.
 - (f) NFPA 253 - Critical Radiant Flux of Floor Covering System.
 - (g) NFPA 2001 - Clean Agent Fire Extinguishing Systems.
- (11) California Division of the State Architect interpretation of Regulations ("DSA IR"), including, without limitation:
 - (a) DSA IR A-6 — Construction Change Document Submittal and Approval Processes.
 - (b) DSA IR A-7 — Project Inspector Certification and Approval.
 - (c) DSA IR A-8 — Project Inspector and Assistant Inspector Duties and Performance.
 - (d) DSA IR A-12 — Assistant Inspector Approval.
- (12) DSA Procedures ("DSA PR")
 - (a) DSA PR 13-01 – Construction Oversight Process
 - (b) DSA PR 13-02 – Project Certification Process

B. This Project shall be governed by applicable regulations, including, without limitation, the State of California's Administrative Regulations for the Division of the State Architect-Structural Safety (DSA/SS), Chapter 4, Part 1, Title 24, CCR, and the most current version on the date the bids are opened and as it pertains to school construction including, without limitation:

- (1) Test and testing laboratory per Section 4-335. District shall pay for the testing laboratory.
- (2) Special inspections per Section 4-333(c).
- (3) Deferred Approvals per section 4-317(g).
- (4) Verified reports per Sections 4-336 & 4-343(c).
- (5) Duties of the Architect & Engineers shall be per Sections 4-333(a) and 4-341.
- (6) Duties of the Contractor shall be per Section 4-343.
- (7) Duties of Project Inspector shall be per Section 4-334.
- (8) Addenda and Construction Change Documents per Section 4-338.

Contractor shall keep and make available all applicable parts of the most current version of Title 24 referred to in the plans and specifications at the Site during construction.

C. Items of deferred approval shall be clearly marked on the first sheet of the Architect's and/or Engineer's approved Drawings. All items later submitted for approval shall be per Title 24 requirements to the DSA.

- (1) Contractor shall submit the following to Architect for review and endorsement:
 - (a) Product information on proposed material/system supplier.
 - (b) Drawings, specifications, and calculations prepared, signed, and stamped by an architect or engineer licensed in the State of California for that portion of the Work.
 - (c) All other requirements as may be required by DSA.
- (2) Cost of preparing and submitting documentation per DSA Deferred Approval requirements including required modifications to Drawings and Specifications, whether or not indicated in the Contract Documents, shall be borne by Contractor.
- (3) Contractor shall not begin fabrication and installation of deferred approval items without first obtaining DSA approval of Drawings and Specifications.
- (4) Schedule of Work Subject to DSA Deferred Approval: Window wall systems exceeding 10 feet in span.

PART 2 – PRODUCTS Not Used.

PART 3 – EXECUTION Not Used.

END OF DOCUMENT

ABBREVIATIONS AND ACRONYMS

PART 1 – GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions including without limitation, Definitions;
- B. Special Conditions.

1.02 DOCUMENT INCLUDES:

- A. Abbreviations used throughout the Contract Documents.
- B. Reference to a technical society, organization, or body is by abbreviation, as follows:

1.	AA	The Aluminum Association
2.	AASHTO	American Association of State Highway and Transportation Officials
3.	ABPA	Acoustical and Board Products Association
4.	ACI	American Concrete Institute
5.	AGA	American Gas Association
6.	AGC	Associated General Contractors of America
7.	AHC	Architectural Hardware Consultant
8.	AHRI	Air Conditioning, Heating, Refrigeration Institute
9.	AI	Asphalt Institute
10.	AIA	American Institute of Architects
11.	AISC	American Institute of Steel Construction
12.	AISI	American Iron and Steel Institute
13.	AMCA	Air Movement and Control Association
14.	ANSI	American National Standards Institute
15.	APA	APA – The Engineered Wood Association
16.	ASCE	American Society of Civil Engineers
17.	ASHRAE	American Society of Heating, Refrigeration and Air Conditioning Engineers
18.	ASME	American Society of Mechanical Engineers
19.	ASTM	American Society of Testing and Materials International
20.	AWPA	American Wood Protection Association
21.	AWPI	American Wood Preservers Institute
22.	AWS	American Welding Society
23.	AWSC	American Welding Society Code
24.	AWI	Architectural Woodwork Institute
25.	AWWA	American Water Works Association
26.	BIA	The Brick Industry Association

27.	CCR	California Code of Regulations
28.	CLFMI	Chain Link Fence Manufacturers Institute
29.	CRA	California Redwood Association
30.	CRSI	Concrete Reinforcing Steel Institute
31.	CS	Commercial Standards
32.	CSI	Construction Specifications Institute
33.	CTI	Cooling Technology Institute
34.	FGIA	Fenestration and Glazing Industry Alliance
35.	FGMA	Flat Glass Manufacturers' Association
36.	FIA	Factory Insurance Association
37.	FM	Factory Mutual Global
38.	FS/FED SPEC	Federal Specification
39.	FTI	Facing Title Institute
40.	GA	Gypsum Association
41.	IAPMO	International Association of Plumbing and Mechanical Officials
42.	ICC	International Code Council
43.	IEEE	Institute of Electrical and Electronics Engineers
44.	IES	Illuminating Engineering Society
45.	MCAC	Mason Contractors Association of California
46.	MIMA	Mineral Wool Insulation Manufacturers Association
47.	MLMA	Metal Lath Manufacturers Association
48.	MS/MIL SPEC	Military Specifications
49.	NAAMM	National Association of Architectural Metal Manufacturers
50.	NBHA	National Builders Hardware Association
51.	NCMA	National Concrete Masonry Association
52.	NCSEA	National Council of Structural Engineers Associations
53.	NEC	National Electrical Code
54.	NEMA	National Electrical Manufacturers Association
55.	NIST	National Institute of Standards and Technology
56.	NSI	Natural Stone Institute
57.	NTMA	National Terrazzo and Mosaic Association, Inc.
58.	ORS	Office of Regulatory Services (California)
59.	OSHA	Occupational Safety and Health Act
60.	PCI	Precast/Prestressed Concrete Institute
61.	PCA	Portland Cement Association
62.	PCA	Painting Contractors Association
63.	PDI	Plumbing Drainage Institute
64.	PEI	Porcelain Enamel Institute, Inc.
65.	PG&E	Pacific Gas & Electric Company
66.	PS	Product Standards
67.	SDI	Steel Door Institute; Steel Deck Institute
68.	SJI	Steel Joist Institute
69.	SSPC	Society for Protective Coatings
70.	TCNA	Tile Council of North America, Inc.
71.	TPI	Truss Plate Institute
72.	UBC	Uniform Building Code
73.	UL	Underwriters Laboratories Code

74.	UMC	Uniform Mechanical Code
75.	USDA	United States Department of Agriculture
76.	VI	Vermiculite Institute
77.	WCLIB	West Coast Lumber Inspection Bureau
78.	WDMA	Window and Door Manufacturers Association
79.	WEUSER	Western Electric Utilities Service Engineering Requirements
80.	WIC	Woodwork Institute of California

PART 2 - PRODUCTS Not Used.

PART 3 - EXECUTION Not Used.

END OF DOCUMENT

DEFINITIONS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions including without limitation, Definitions;
- B. Special Conditions.

1.02 QUALITY ASSURANCE

- A. For products or workmanship specified by association, trade, or Federal Standards, Contractor shall comply with requirements of the standard, except when more rigid requirements are specified in the Contract Documents, or are required by applicable codes.
- B. Contractor shall conform to current reference standard publication date in effect on the date of bid opening.
- C. Contractor shall obtain copies of standards unless specifically required not to by the Contract Documents.
- D. Contractor shall maintain a copy of all standards at jobsite during submittals, planning, and progress of the specific Work, until final completion, unless specifically required not to by the Contract Documents.
- E. Should specified reference standards conflict with Contract Documents, Contractor shall request clarification from the District and/or the Architect before proceeding.
- F. The contractual relationship of the parties to the Contract shall not be altered from the contractual relationship as indicated in the Contract Documents by mention or inference otherwise in any referenced document.
- G. Governing Codes shall be as shown in the Contract Documents including, without limitation, the Specifications.

END OF DOCUMENT

REFERENCES**PART 1 - GENERAL****1.01 SCHEDULE OF REFERENCES:**

The following information is intended only for the general assistance of the Contractor, and the District does not represent that all of the information is current. It is the Contractor's responsibility to verify the correct information for each of the entities listed.

AA	The Aluminum Association 1400 Crystal Drive, Suite 430 Arlington, VA 22202 www.aluminum.org	703/358-2960
AABC	Associated Air Balance Council 2401 Pennsylvania Avenue NW, Suite 330 Washington, DC 20037 www.aabc.com	202/737-0202
AASHTO	American Association of State Highway and Transportation Officials 555 12th St. NW - Suite 1000 Washington, DC 20004 www.transportation.org	202/624-5800
AATCC	American Association of Textile Chemists and Colorists P.O. Box 12215 Research Triangle Park, NC 27709-2215 www.aatcc.org	919/549-8141
ACA	American Coatings Association 901 New York Ave., NW, Suite 300 West Washington, DC 20001 www.paint.org	202/462-6272
ACI	American Concrete Institute 38800 Country Club Dr. Farmington Hills, MI 48331-3439 www.concrete.org	248/848-3800
ACPA	American Concrete Pipe Association 5605 N. MacArthur Blvd., Suite 340 Irving, TX 75038 www.concrete-pipe.org	972/506-7216

ADC	Air Duct Council 1901 N. Roselle Road, Suite 800 Schaumburg, IL 60195 www.flexibleduct.org	847/706-6750
AF&PA	American Forest and Paper Association 1101 K Street, NW, Suite 700 Washington, DC 20005 www.afandpa.org	202/463-2700
AGA	American Gas Association 400 North Capitol Street, NW, Suite 450 Washington, DC 20001 www.aga.org	202/824-7000
AGC	Associate General Contractors of America 2300 Wilson Blvd., Suite 300 Arlington, VA 22201 www.agc.org	703/548-3118
AHA	American Hardboard Association 1210 West Northwest Highway Palatine, IL 60067 http://domensino.com/AHA/default.htm	847/934-8800
AI	Asphalt Institute 2696 Research Park Drive Lexington, KY 40511-8480 www.asphaltinstitute.org	859/288-4960
AIA	The American Institute of Architects 1735 New York Ave., NW Washington, DC 20006-5292 www.aia.org	202/626-7300
AISC	American Institute of Steel Construction 130 East Randolph Street, Suite 2000 Chicago, IL 60601 www.aisc.org	312.670.2400
AISI	American Iron and Steel Institute 25 Massachusetts Ave., NW, Suite 800 Washington, DC 20001 www.steel.org	202/452-7100
AITC	American Institute of Timber Construction 1010 South 336th Street, #210 Federal Way, WA 98003-7394 https://www.plib.org/aitc/	253/835-3344

ALI	Associated Laboratories, Inc. P.O. Box 152837 Dallas, TX 75315 www.assoc-labs.com	214/565-0593
ALSC	American Lumber Standards Committee, Inc. 7470 New Technology Way, Suite F Frederick, MD 21703 www.alsc.org	301/972-1700
AMCA	Air Movement and Control Association International, Inc. 30 W. University Drive Arlington Heights, IL 60004 www.amca.org	847/394-0150
AMPP (formerly SSPC)	Association for Materials Protection and Performance (merger of Society for Protective Coatings and National Association of Corrosion Engineers International) (formerly Steel Structures Painting Council) 800 Trumbull Drive Pittsburgh, PA 15205 www.sspc.org	412/281-2331 877/281-7772
ANLA	AmericanHort (merger of American Nursery & Landscape Association and OFA – The Association of Horticultural Professionals) 2130 Stella Court Columbus, OH 43215 www.americanhort.org	614/487-1117
ANSI	American National Standards Institute 1899 L Street, NW, 11th Floor Washington, DC 20036 www.ansi.org	202/293-8020
APA	APA-The Engineered Wood Association 7011 S. 19th Street Tacoma, WA 98466-5333 www.apawood.org	253/565-6600

APA	Architectural Precast Association 325 John Knox Rd, Suite L-103 Tallahassee, FL 32303 www.archprecast.org	850/205-5637
APCIA	American Property Casualty Insurance Association (merger of American Insurance Association (formerly the National Board of Fire Underwriters) with the Property Casualty Insurers Association of America) 555 12th St, NW, Suite 550 Washington DC 20004 www.apci.org	202/828-7100
AHRI	Air Conditioning and Refrigeration Institute (now Air-Conditioning, Heating, & Refrigeration Institute) 2311 Wilson Blvd, Suite 400 Arlington, VA 22201 www.ahrinet.org	703/524-8800
ARMA	Asphalt Roofing Manufacturers Association 2331 Rock Spring Road Forest Hill, MD 21050 www.asphaltroofing.org	443/640-1075
ASA	The Acoustical Society of America Suite 300 1305 Walt Whitman Road Melville, NY 11747-4300 https://acousticalsociety.org/	516/576-2360
ASCE	American Society of Civil Engineers 1801 Alexander Bell Drive Reston, VA 20191 www.asce.org	800/548-2723 703/295-6300
ASHRAE	American Society of Heating, Refrigerating and Air Conditioning Engineers 180 Technology Parkway Peachtree Corners, GA 30092 www.ashrae.org	800/527-4723 404/636-8400
ASLA	American Society of Landscape Architects 636 Eye Street, NW Washington, DC 20001-3736 www.asla.org	202/898-2444
ASME	American Society of Mechanical Engineers Two Park Avenue New York, NY 10016-5990 www.asme.org	800/834-2763

ASPE	American Society of Plumbing Engineers 6400 Shafer Court, Suite 350 Rosemont, IL 60018 http://aspe.org	847/296-0002
ASQ	American Society for Quality P.O. Box 3005 Milwaukee, WI 53201-3005 or 600 North Plankinton Avenue Milwaukee, WI 53203 http://asq.org	800/248-1946 414/272-8575
ASSE	American Society of Sanitary Engineering 18927 Hickory Creek Dr., Suite 220 Mokena, IL 60448 www.asse-plumbing.org	708/995-3019
ASTM	ASTM International 100 Barr Harbor Drive PO Box C700 West Conshohocken, PA, 19428-2959 www.astm.org	610/832-9500
AWCI	Association of the Wall and Ceiling Industry 513 West Broad Street, Suite 210 Falls Church, VA 22046 www.awci.org	703/538-1600
AWPA	American Wood Protection Association (formerly American Wood Preservers Institute) P.O. Box 361784 Birmingham, AL 35236-1784 www.awpa.com	205/733-4077
AWS	American Welding Society 8669 NW 36 Street, Suite 130 Miami, FL 33166 www.aws.org	800/443-9353 305/443-9353
AWI	Architectural Woodwork Institute 46179 Westlake Drive, Suite 120 Potomac Falls, VA 20165-5874 www.awinet.org	571/323-3636
AWWA	American Water Works Association 6666 West Quincy Avenue Denver, CO 80235 www.awwa.org	800/926-7337 303/794-7711

BHMA	Builders Hardware Manufacturers Association 355 Lexington Avenue, 15th Floor New York, NY 10017 www.buildershardware.com	212/297-2122
BIA	The Brick Industry Association 12007 Sunrise Valley Drive, Suite 430 Reston, VA 20191 www.gobrick.com	703/620-0010
CGA	Compressed Gas Association 8484 Westpark Drive, Suite 220 McLean, VA 22102 www.cganet.com	703/788-2700
CISCA	Ceilings & Interior Systems Construction Association 1010 Jorie Blvd, Suite 30 Oak Brook, IL 60523 www.cisca.org	630/584-1919
CISPI	Cast Iron Soil Pipe Institute 2401 Fieldcrest Dr. Mundelein, IL 60060 www.cispi.org	224/864-2910
CLFMI	Chain Link Fence Manufacturers Institute 10015 Old Columbia Road, Suite B-215 Columbia, MD 21046 chainlinkinfo.org	301/596-2583
CPA	Composite Panel Association 19465 Deerfield Avenue, Suite 306 Leesburg, VA 20176 www.compositepanel.org	703/724-1128
CPSC	Consumer Product Safety Commission 4330 East-West Highway Bethesda, MD 20814 www.cpsc.gov	800/638-2772
CRA	California Redwood Association 818 Grayson Road, Suite 201 Pleasant Hill, CA 94523 www.calredwood.org	925/935-1499

CRI	Carpet and Rug Institute 100 S. Hamilton Street Dalton, GA 30722-2048 www.carpet-rug.org	706/278-3176
CRSI	Concrete Reinforcing Steel Institute 933 N. Plum Grove Road Schaumburg, IL 60173-4758 www.crsi.org	847/517-1200
CSI	The Construction Specifications Institute 123 North Pitt St, Suite 450 Alexandria, VA 22314 www.csinet.org	800/689-2900
CTIOA	Ceramic Tile Institute of America 12061 Jefferson Blvd. Culver City, CA 90230-6219 www.ctioa.org	310/574-7800
DHA	Decorative Hardwoods Association (formerly Hardwood Plywood & Veneer Association) 42777 Trade West Dr. Sterling, VA 20166 https://www.decorativehardwoods.org/	703/435-2900
DHI	Door and Hardware Institute (formerly National Builders Hardware Association) 2001 K Street NW, 3rd Floor North Washington, DC 20006 www.dhi.org	202/367-1134
DIPRA	Ductile Iron Pipe Research Association P.O. Box 190306 Birmingham, AL 35219 www.dipra.org	205/402-8700
DOC	U.S. Department of Commerce 1401 Constitution Ave., NW Washington, DC 20230 www.commerce.gov	202/482-2000
DOT	U.S. Department of Transportation 1200 New Jersey Avenue, SE Washington, DC 20590 www.dot.gov	855/368-4200
EJMA	Expansion Joint Manufacturers Association, Inc. 25 North Broadway Tarrytown, NY 10591 www.ejma.org	914/332-0040

EPA	Environmental Protection Agency Ariel Rios Building 1200 Pennsylvania Avenue, N.W. Washington, DC 20460 www.epa.gov	202/272-0167
FCICA	Floor Covering Installation Contractors Association 800 Roosevelt Rd., Bldg. C, Suite 312 Glen Ellyn, IL 60137 www.fcica.com	630/672-3702
FGIA	Fenestration and Glazing Industry Alliance 1900 E Golf Rd, Suite 1250 Schaumburg, IL 60173 https://fgiaonline.org/	847/303-5664
FM Global	Factory Mutual Insurance Company Amy Daley Global Practice Leader – Education, Public Entities, Health Care FM Global 270 Central Avenue Johnston, RI 02919-4949 www.fmglobal.com	401/275-3000 401/275-3029
FS	General Services Administration (GSA) Index of Federal Specifications, Standards and Commercial Item Descriptions 470 East L'Enfant Plaza, SW, Suite 8100 Washington, DC 20407 www.gsa.gov	202/619-8925
GA	The Gypsum Association 962 Wayne Ave., Suite 620 Silver Spring, MD 20910 www.gypsum.org	301/277-8686
HMA	Hardwood Manufacturers Association One Williamsburg Place, Suite 108 Warrendale, PA 15086 http://hmamembers.org	412/244-0440

IAPMO	International Association of Plumbing and Mechanical Officials (formerly the Western Plumbing Officials Association) 4755 E. Philadelphia St. Ontario, CA 91761 www.iapmo.org	909/472-4100
ICC	International Code Council 500 New Jersey Avenue, NW, 6th Floor Washington, DC 20001 www.iccsafe.org	888/422-7233
IEEE	Institute of Electrical and Electronics Engineers 3 Park Avenue, 17th Floor New York, NY 10016-5997 www.ieee.org	212/419-7900
IES	Illuminating Engineering Society 120 Wall Street, Floor 17 New York, NY 10005-4001 www.ies.org	212/248-5000
ITRK	Intertek Testing Services 3933 US Route 11 Cortland, NY 13045 www.intertek.com	607/753-6711
MCAA	Mechanical Contractors Association of America 1385 Piccard Drive Rockville, MD 20850 www.mcaa.org	301/869-5800
MMPA (formerly WMMPA)	Moulding & Millwork Producers Association (formerly Wood Moulding & Millwork Producers Association) 507 First Street Woodland, CA 95695 www.wmmpa.com	530/661-9591 800/550-7889
MSS	Manufacturers Standardization Society (MSS) of the Valve and Fittings Industry, Inc. 127 Park Street, NE Vienna, VA 22180-4602 http://mss-hq.org	703/281-6613
NAAMM	National Association of Architectural Metal Manufacturers 800 Roosevelt Rd. Bldg. C, Suite 312 Glen Ellyn, IL 60137 www.naamm.org	630/942-6591

NAIMA	North American Insulation Manufacturers Association P.O. Box 1906 Alexandria, VA 22313 https://insulationinstitute.org/	703/684-0084
NALP	National Association of Landscape Professionals (formerly Professional Landcare Network) 12500 Fair Lakes Circle, Suite 200 Fairfax, VA 22033 https://www.landscapeprofessionals.org/	703/736-9666
NAPA	National Asphalt Pavement Association 6406 Ivy Lane, Suite 350 Greenbelt, MD 20770-1441 www.asphaltpavement.org	888/468-6499 301/731-4748
NCSPA	National Corrugated Steel Pipe Association 14070 Proton Road, Suite 100 Dallas, TX 75244 www.ncspa.org	972/850-1907
NCMA	National Concrete Masonry Association 13750 Sunrise Valley Drive Herndon, VA 20171-4662 www.ncma.org	703/713-1900
NEBB	National Environmental Balancing Bureau 8575 Grovemont Circle Gaithersburg, MD 20877 www.nebb.org	301/977-3698
NECA	National Electrical Contractors Association 1201 Pennsylvania Ave. NW Washington, D.C., 20004 www.necanet.org	202/991-6300
NEMA	National Electrical Manufacturers Association 1300 North 17th Street N, Suite 900 Rosslyn, VA 22209 www.nema.org	703/841-3200
NEII	National Elevator Industry, Inc. 5537 SW Urish Road Topeka, KS 66610 https://nationalelevatorindustry.org/	703/589-9985
NFPA	National Fire Protection Association 1 Batterymarch Park Quincy, MA 02169-7471 www.nfpa.org	800/344-3555 855/274-8525

NGA (formerly GANA)	National Glass Association (merged with Glass Association of North America) 1945 Old Gallows Road Suite 750 Vienna, VA 22182 www.glass.org	866/342-5642 Ext 127
NHLA	National Hardwood Lumber Association PO Box 34518 Memphis, TN 38184 www.nhla.com	901/377-1818
NIA	National Insulation Association 516 Herndon Pkwy., Ste. D Herndon, VA 20170 www.insulation.org	703/464-6422
NRCA	National Roofing Contractors Association 10255 W. Higgins Road, Suite 600 Rosemont, IL 60018-5607 www.nrca.net	847/299-9070
NSF	NSF International 789 N. Dixboro Road Ann Arbor, MI 48113-0140 www.nsf.org	800/673-6275 734/769-8010
NSI	Natural Stone Institute (formerly Marble Institute of America) 380 E. Lorain St. Oberlin, OH 44074 https://www.naturalstoneinstitute.org/	440/250-9222
NTMA	National Terrazzo and Mosaic Association 209 N. Crockett Street, Suite 2 PO Box 2605 Fredericksburg, TX 78624 www.ntma.com	800/323-9736
OSHA	Occupational Safety and Health Act U.S. Department of Labor Occupational Safety & Health Administration 200 Constitution Ave., NW Washington, DC 20210 www.osha.gov	800/321-OSHA (6742)

PCA	Portland Cement Association 5420 Old Orchard Road Skokie, IL 60077 or 200 Massachusetts Ave NW, Suite 200 Washington, DC 20001 www.cement.org	847/966-6200 202/408-9494
PCA	Painting Contractors Association (formerly Painting and Decorating Contractors of America) 2316 Millpark Drive Maryland Heights, MO 63043 https://www.pcapainted.org/	800/322-7322
PCI	Precast/Prestressed Concrete Institute 8770 W. Bryn Mawr Ave., Suite 1150 Chicago, IL 60631 www.pci.org	312/786-0300
PDI	Plumbing & Drainage Institute 800 Turnpike Street, Suite 300 North Andover, MA 01845 http://pdionline.org	978/557-0720 800/589-8956
PEI	Porcelain Enamel Institute, Inc. P.O. Box 920220 Norcross, GA 30010 www.porcelainenamel.com	770/676-9366
PG&E	Pacific Gas & Electric Company P.O. Box 997300 Sacramento, CA 95899-7300 www.pge.com	800/743-5000
PLIB	Pacific Lumber Inspection Bureau (formerly West Coast Lumber Inspection Bureau) 1010 South 336th Street, Suite 210 Federal Way, WA 98003-7394 https://www.plib.org/	253/835-3344
RFCI	Resilient Floor Covering Institute 115 Broad Street, Suite 201 La Grange, GA 30240 www.rfci.com	706/882-3833
SDI	Steel Deck Institute P.O. Box 426 Glenshaw, PA 15116 www.sdi.org	412/487-3325

SDI	Steel Door Institute 30200 Detroit Road Westlake, OH 44145 www.steeldoor.org	440/899-0010
SJI	Steel Joist Institute 140 West Evans Street, Suite 203 Florence, SC 29501 http://steeljoist.org	843/407-4091
SMA	Stucco Manufacturers Association 5753 E Santa Ana Cyn Rd, #G-156 Anaheim, CA 92807 www.stuccomfgassoc.com	714/473-9579
SMACNA	Sheet Metal and Air Conditioning Contractors' National Association 4201 Lafayette Center Drive Chantilly, VA 20151-1219 www.smacna.org	703/803-2980
SPI	SPI: The Plastics Industry Trade Association, Inc. 1425 K St. NW, Suite 500 Washington, DC 20005 www.plasticsindustry.org	202/974-5200
TCA	The Tile Council of North America 100 Clemson Research Blvd. Anderson, SC 29625 www.tcnatile.com	864/646-8453
TPI	Truss Plate Institute 2670 Crain Highway, Suite 203 Waldorf, MD 20601 www.tpinst.org	240/587-5582
TPI	Turfgrass Producers International 444 E. Roosevelt Road #346 Lombard, IL 60148 www.turfgrasssod.org	800/405-8873 847/649-5555
TCIA	Tree Care Industry Association (formerly the National Arborist Association) 670 N Commercial Street, Suite 201 Manchester, NH 03101 www.tcia.org	603/314-5380 800/733-2622

TVI	The Vermiculite Institute c/o The Schundler Company 10 Central Street Nahant, MA 01908 www.vermiculiteinstitute.org	732/287-2244
UL	Underwriters Laboratories Inc. 333 Pfingsten Road Northbrook, IL 60062-2096 www.ul.com	847/272-8800 877/854-3577
UNI	Uni-Bell PVC Pipe Association 201 E. John Carpenter Freeway, Suite 750 Irving, TX 75062 www.uni-bell.org	972/243-3902
USDA	U.S. Department of Agriculture 1400 Independence Ave., S.W. Washington, DC 20250 www.usda.gov	202/720-2791
WA	Wallcoverings Association 35 E Wacker Dr., Suite 850 Chicago, IL 60601 www.wallcoverings.org	312/224-2574
WCMA	Window Covering Manufacturers Association 355 Lexington Avenue 15th Floor New York, NY 10017 www.wcmanet.org	212/297-2122
WDMA	Window & Door Manufacturers Association 2001 K Street NW, 3rd Floor North Washington, D.C. 20006 www.wdma.com	202/367-1157
WI	Woodwork Institute 1455 Response Road, Suite 110 Sacramento, CA 95815 www.wicnet.org	916/372-9943
WRI	Wire Reinforcement Institute 942 Main Street, Suite 300 Hartford, CT 06103 www.wirereinforcementinstitute.org	860/240-9545
WWCA	Western Wall & Ceiling Contractors Association 1910 N. Lime St. Orange, CA 92865 www.wwcca.org	714/221-5520

WWPA	Western Wood Products Association (formerly Redwood Inspection Service) 1500 SW First Ave., Suite 870 Portland, OR 97201 www.wwpa.org	503/224-3930
------	--	--------------

PART 2 - PRODUCTS Not Used.

PART 3 - EXECUTION Not Used.

END OF DOCUMENT

MATERIALS AND EQUIPMENT

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Purchase of Materials and Equipment;
- B. Special Conditions;
- C. Imported Materials Certification.

1.02 MATERIAL AND EQUIPMENT

- A. Only items approved by the District and/or Design Professional shall be used.
- B. Contractor shall submit lists of products and other product information in accordance with the Contract Documents, including, without limitation, the provisions regarding the submittals.

1.03 MATERIAL AND EQUIPMENT COLORS

- A. The District and/or Architect will provide a schedule of colors.
- B. No individual color selections will be made until after approval of all pertinent materials and equipment and after receipt of appropriate samples in accordance with the Contract Documents, including, without limitation, the provisions regarding the submittals.
- C. Contractor shall request priority in writing for any item requiring advance ordering to maintain the approved Construction Schedule.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. Contractor shall deliver manufactured materials in original packages, containers, or bundles (with seals unbroken), bearing name or identification mark of manufacturer.
- B. Contractor shall deliver fabrications in as large assemblies as practicable; where specified as shop-primed or shop-finished, package or crate as required to preserve such priming or finish intact and free from abrasion.
- C. Contractor shall store materials in such a manner as necessary to properly protect them from damage. Materials or equipment damaged by handling, weather, dirt, or from any other cause will not be accepted.

- D. Materials are not acceptable that have been warehoused for long periods of time, stored or transported in improper environment, improperly packaged, inadequately labeled, poorly protected, excessively shipped, deviated from normal distribution pattern, or reassembled.
- E. Contractor shall store material so as to cause no obstructions of sidewalks, roadways, access to the Site or buildings, and underground services. Contractor shall protect material and equipment furnished under Contract.
- F. Contractor may store materials on Site with prior written approval by the District, all material shall remain under Contractor's control and Contractor shall remain liable for any damage to the materials. Should the Project Site not have storage area available, the Contractor shall provide for off-site storage at a bonded warehouse and with appropriate insurance coverage at no cost to District.
- G. When any room in Project is used as a shop or storeroom, the Contractor shall be responsible for any repairs, patching, or cleaning necessary due to that use. Location of storage space shall be subject to prior written approval by District.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Manufacturers listed in various sections of Contract Documents are names of those manufacturers that are believed to be capable of supplying one or more of items specified therein.
- B. The listing of a manufacturer does not imply that every product of that manufacturer is acceptable as meeting the requirements of the Contract Documents.

2.02 FACILITIES AND EQUIPMENT

Contractor shall provide, install, maintain, and operate a complete and adequate facility for handling, the execution, disposal, and distribution of material and equipment as required for proper and timely performance of Work connected with Contract.

2.03 MATERIAL REFERENCE STANDARDS

Where material is specified solely by reference to "standard specifications" and if requested by District, Contractor shall submit for review data on actual material proposed to be incorporated into Work of Contract listing name and address of vendor, manufacturer, or producer, and trade or brand names of those materials, and data substantiating compliance with standard specifications.

PART 3 - EXECUTION

3.01 WORKMANSHIP

- A. Where not more specifically described in any other Contract Documents, workmanship shall conform to methods and operations of best standards and accepted practices of trade or trades involved and shall include items of fabrication, construction, or installation regularly furnished or required for completion (including finish and for successful operation, as intended).
- B. Work shall be executed by tradespersons skilled in their respective lines of Work. When completed, parts shall have been durably and substantially built and present a neat appearance.

3.02 COORDINATION

- A. Contractor shall coordinate installation of Work so as to not interfere with installation of others. Adjustment or rework because of Contractor's failure to coordinate will be at no additional cost to District.
- B. Contractor shall examine in-place work for readiness, completeness, fitness to be concealed or to receive other work, and in compliance with Contract Documents. Concealing or covering Work constitutes acceptance of additional cost which will result should in-place Work be found unsuitable for receiving other Work or otherwise deviating from the requirements of the Contract Documents.

3.03 COMPLETENESS

Contractor shall provide all portions of the Work, unless clearly stated otherwise, installed complete and operational with all elements, accessories, anchorages, utility connections, etc., in manner to assure well-balanced performance, in accordance with manufacturer's recommendations and by Contract Documents. Terms such as "installed complete," "operable condition," "for use intended," "connected to all utilities," "terminate with proper cap," "adequately anchored," "patch and refinish," "to match similar," should be assumed to apply in all cases, except where completeness of functional or operable condition is specifically stated as not required.

3.04 APPROVED INSTALLER OR APPLICATOR

Installation by a manufacturer's approved installer or applicator is an understood part of Specifications and only approved installer or applicator is to provide on-site Work where specified manufacturer has on-going program of approving (i.e. certifying, bonding, re-warranting) installers or applicators. Newly established relationships between a manufacturer and an installer or applicator who does not have other approved applicator work in progress or completed is not approved for this Project.

3.05 MANUFACTURER'S RECOMMENDATIONS

All installations shall be in accordance with manufacturer's published recommendations and specific written directions of manufacturer's representative.

Should Contract Documents differ from recommendations of manufacturer or directions of his representative, Contractor shall analyze differences, make recommendations to the District and the Architect in writing, and shall not proceed until interpretation or clarification has been issued by the District and/or the Architect.

END OF DOCUMENT

QUALITY CONTROL

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Inspector, Inspections and Tests, Uncovering of Work and Non-conforming of Work and Correction of Work;
- B. Special Conditions.

1.02 RELATED CODES:

- A. The Work is governed by requirements of Title 24, California Code of Regulations ("CCR"), and the Contractor shall keep a copy of these available at the job Site for ready reference during construction.
- B. The Division of the State Architect ("DSA") shall be notified at or before the start of construction.

1.03 OBSERVATION AND SUPERVISION:

- A. The District and Architect or their appointed representatives will review the Work and the Contractor shall provide facilities and access to the Work at all times as required to facilitate this review. Administration by the Architect and any consulting Structural Engineer will be in accordance with applicable regulations, including, without limitation, CCR, Part 1, Title 24, Section 4-341.
- B. One or more Project Inspector(s) approved by DSA and employed by or in contract with the District, referred to hereinafter as the "Project Inspector", will observe the work in accordance with CCR, Part 1, Title 24, Sections 4-333(b) and 4-342:
 - (1) The Project Inspector and Special Inspector(s) shall have access to the Work wherever it is in preparation or progress for ascertaining that the Work is in accordance with the Contract Documents and all applicable code sections. The Contractor shall provide facilities and operation of equipment as needed, and access as required and shall provide assistance for sampling or measuring materials.
 - (2) The Project Inspector will notify the District and Architect and call the attention of the Contractor to any observed failure of Work or material to conform to Contract Documents.

The Contractor shall conform with all applicable laws as indicated in the Contract Documents, including, without limitation, to CCR, Part 1, Title 24, Section 4-343.

The Contractor shall supervise and direct the Work and maintain a competent superintendent on the job who is authorized to act in all matters pertaining to the Work. The Contractor's superintendent shall also inspect all materials, as they arrive, for compliance with the Contract Documents. Contractor shall reject defective Work or materials immediately upon delivery or failure of the Work or material to comply with the Contract Documents. The Contractor shall submit verified reports as indicated in the Contract Documents, including, without limitation, the Specifications and as required by Part 1, Title 24, Section 4-336.

1.04 TESTING AGENCIES:

- A. Testing agencies and tests shall be in conformance with the General Documents and the requirements of Part 1, Title 24, Section 4- 335.
- B. Testing and inspection in connection with earthwork shall be under the direction of the District's consulting soils engineer, if any, referred to hereinafter as the "Soils Engineer."
- C. Testing and inspection of construction materials and workmanship shall be performed by a qualified laboratory, referred to hereinafter as the "Testing Laboratory." The Testing Laboratory shall be under direction of an engineer registered in the State of California, shall conform to requirements of ASTM E329, and shall be employed by or in contract with the District.
- D. Testing laboratory shall be approved by the Architect and the Division of the State Architect.
- E. Owner will employ and pay for services of an independent testing labatory to perform specified inspection and testing. Retesting cost for failed test will be Contractors responsibilityand will be back-charged against the contract.

1.05 TESTS AND INSPECTIONS:

- A. The Contractor shall be responsible for notifying the District and Project Inspector of all required tests and inspections. Contractor shall notify the District and Project Inspector at least seventy-two hours (72) hours in advance of performing any Work requiring testing or inspection.
- B. The Contractor shall provide access to Work to be tested and furnish incidental labor, equipment, and facilities to facilitate all inspections and tests.
- C. The District will pay for first inspections and tests required by the "CCR", and other inspections or tests that the District and/or the Architect may direct to have made, including the following principal items:
 - (1) Tests and observations for earthwork and paving.
 - (2) Tests for concrete mix designs, including tests of trial batches.
 - (3) Tests and inspections for structural steel work.
 - (4) Field tests for framing lumber moisture content.

- (5) Additional tests directed by the District that establish that materials and installation comply with the Contract Documents.
 - (6) Tests and observations of welding and expansion anchors.
- D. The District may at its discretion, pay and then back charge the Contractor for:
 - (1) Retests or reinspections, if required, and tests or inspections required due to Contractor error or lack of required identifications of material.
 - (2) Uncovering of work in accordance with Contract Documents.
 - (3) Testing done on weekends, holidays, and overtime will be chargeable to the Contractor for the overtime portion.
 - (4) Testing done off Site.
- E. Testing and inspection reports and certifications:
 - (1) If initially received by Contractor, Contractor shall provide to each of the following a copy of the agency or laboratory report of each test or inspection or certification.
 - (a) The District;
 - (b) The Construction Manager, if any;
 - (c) The Architect;
 - (d) The Consulting Engineer, if any;
 - (e) Other engineers on the Project, as appropriate;
 - (f) The Project Inspector; and
 - (g) The Contractor.
 - (2) When the test or inspection is one required by the CCR, a copy of the report shall also be provided to the DSA.

1.06 LABORATORY REPORTS

- A. After each inspection and test, promptly submit two copies of laboratory report to Owner, Architect, Contractor and DSA.
- B. Include:
 - (1) Date of issue,
 - (2) DSA Application and File numbers,
 - (3) Project title and number,

- (4) Name of inspector,
- (5) Date and time of sampling or inspection,
- (6) Identification of product and Specification Section,
- (7) Location in the Project,
- (8) Type of inspection or test,
- (9) Date of test,
- (10) Results of test,
- (11) Conformance with Contract Documents.

C. When requested by Architect, provide interpretation of test results.

1.07 LIMITS ON TESTING LABORATORY AUTHORITY

- A. Laboratory may not release, revoke, alter or enlarge on requirements of Contract Documents.
- B. Laboratory may not approve or accept any portion of the work.
- C. Laboratory may not assume any duties of Contractor.
- D. Laboratory has no authority to stop the work.

PART 2 - PRODUCTS

2.01 TYPE OF TEST AND INSPECTIONS

- A. Testing and inspection shall be in accordance with DSA Form 103 (or current version)
- B. Slump Test
ASTM C 143
- C. Concrete Tests

Testing agency shall test concrete used in the work per the following paragraphs:

- (1) Compressive Strength:
 - (a) Minimum number of tests required: One (1) set of three (3) cylinders for each 100 cubic yards (Sec. 2604(h) 01) of concrete or major fraction thereof, placed in one (1) day. See Title 24, Section 2605(g).

- (b) Two cylinders of each set shall be tested at twenty-eight (28) days. One (1) cylinder shall be held in reserve and tested only when directed by the Architect or District.
- (c) Concrete shall test the minimum ultimate compressive strength in twenty-eight 28 days, as specified on the structural drawings.
- (d) In the event that the twenty-eight (28) day test falls below the minimum specified strength, the effective concrete in place shall be tested by taking cores in accordance with UBC Standard No. 26-13 and tested as required for cylinders.
- (e) In the event that the test on core specimens falls below the minimum specified strength, the concrete will be deemed defective and shall be removed and replaced upon such direction of the Architect, and in a manner acceptable to the Division of the State Architect.

D. Reinforcing, Steel

PART 3 - EXECUTION Not Used.

END OF DOCUMENT

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Administrative and procedural requirements related to inspections, tests, and related quality control procedures required to be performed by the Contractor and that facilitate the Contractor's compliance with the Contract Documents.

1.2 RELATED REQUIREMENTS

- A. Section 01 3300, Submittal Procedures; submission of manufacturers' instructions and certificates.
- B. Section 01 4523, Testing and Inspecting Services, and DSA 103; Special Tests and Inspections required by authorities having jurisdiction and are the responsibility of Owner.
- C. Section 01 7700, Closeout Procedures.
- D. Specific requirements for testing, inspections, mockups, and other quality control requirements as described in the various Sections of the Specifications.

1.3 DEFINITIONS

- A. Experienced: When used with an entity or individual, and unless otherwise specified, means having successfully completed a minimum of three previous projects similar in nature, size, and extent to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.
- B. Field Quality-Control Tests: Tests and inspections that are performed on-site for installation of the Work and for completed Work.
- C. Installer/Applicator/Erector: Contractor or another entity engaged by Contractor as an employee, subcontractor, or sub-subcontractor, to perform a particular construction operation, including installation, erection, application, assembly, and similar operations.
- D. Mockups: Full-size, physical assemblies that are constructed on-site and in-place mockups to demonstrate aesthetic effects and, where indicated, qualities of materials and execution, and to review construction, coordination, interface, testing, and operation of various building components. Mockups are not samples.
- E. Tests: Procedures intended to establish the quality, performance, or reliability of a product or system conducted by a qualified Testing Agency.
- F. Source Quality-Control Tests: Tests and inspections related to materials manufactured or fabricated away from the jobsite that will be incorporated into the work.

FIELD QUALITY CONTROL PROCEDURES
SECTION 01 4516
3595001

- G. Testing Agency: An independent entity engaged to perform specific tests, inspections, or both, is qualified to operate in California, and meets the additional requirements specified.
 - 1. Testing laboratory shall mean the same as Testing Agency.
- H. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.
- I. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that actual products incorporated into the Work and completed construction comply with requirements. Contractor's quality-control services do not include Contract administration activities performed by Architect.

1.4 REFERENCES AND STANDARD SPECIFICATIONS

- A. General:
 - 1. The Contract Documents contain references to various standard specifications, codes, practices, and requirements for materials, work quality, installation, inspections, and tests published and issued by the organizations, societies, and associations.
 - 2. Contractor shall obtain its own copies of required specified referenced publications.
 - 3. The specification or standard referred to shall have full force and effect as though printed in these Specifications.
 - 4. When the effective date of a reference standard is not specified, it shall be understood that the current edition or latest revision thereof and any amendments or supplements thereto in effect on the date of the DSA approval, shall govern the Work.
 - 5. The contractual relationships, duties, and responsibilities of the parties in Contract or those of the Architect shall not be altered from the Contract Documents by mention or inference otherwise in any reference document.
- B. Products or workmanship specified by association, trade, or other consensus standards shall comply with requirements of the referenced standard or specification except when more rigid requirements are specified or are required by applicable codes.
- C. Conflicting Requirements:
 - 1. If compliance with two or more standards or requirements are specified and the standards or requirements establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement.
 - 2. Refer conflicting requirements that are different, but apparently equal, to Architect for direction before proceeding.

1.5 ADMINISTRATIVE REQUIREMENTS

- A. Submittal Procedures:
 - 1. Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
 - 2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.

1.6 INFORMATIONAL SUBMITTALS

- A. Schedule of Tests and Inspections.
- B. Field Superintendent's Quality Control Responsibilities
- C. Procedures for inspection prior to subsequent Work or cover up.
- D. Qualifications of Contractor's Testing Agencies.
- E. Certified copies of Reports and Documents.

1.7 CLOSEOUT SUBMITTALS

- A. Permits, Licenses, and Certificates: Copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents established for compliance with standards and regulations bearing on performance of the Work.
- B. Test and Inspection Log including final record for each test and inspection as specified in Part 3 and in accordance with Section 01 7839, Project Record Documents.

1.8 REPORTS AND DOCUMENTS

- A. Test and Inspection Reports: Prepare and submit certified written reports where specified in the Specification Sections. Include the following:
 - 1. Date of issue.
 - 2. Project title and number.
 - 3. Name, address, and telephone number of testing agency.
 - 4. Dates and locations of samples and tests or inspections.
 - 5. Names of individuals making tests and inspections.
 - 6. Description of the Work and test and inspection method.
 - 7. Identification of product and Specification Section.
 - 8. Complete test or inspection data.
 - 9. Test and inspection results and an interpretation of test results.
 - 10. Record of temperature and weather conditions at time of sample taking and testing and inspecting.

FIELD QUALITY CONTROL PROCEDURES
SECTION 01 4516
3595001

11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
12. Name and signature of laboratory inspector.
13. Recommendations on retesting and re-inspecting.

1.9 QUALITY ASSURANCE

- A. Minimum Quantity or Quality Levels:
1. The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements.
 2. Refer uncertainties to Architect for a decision before proceeding.
- B. Use of trade-specific terminology in referring to a trade or entity does not require that certain construction activities be performed by accredited or unionized individuals, or that requirements specified apply exclusively to specific trade(s).
- C. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce Work of specified quality.
- D. Correct conditions or workmanship not in conformance with specified standards or quality. Do so immediately after non-conformance item is discovered or within a reasonable time frame agreed upon with Construction Manager.
- E. Comply with manufacturers' instructions, including each step in sequence. Should manufacturers' instructions conflict with Contract Documents, request clarification from the Architect before proceeding.
- F. Comply with specified standards as minimum quality for the Work, except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.
- G. Perform Work by persons qualified to produce required and specified quality.
- H. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, or disfigurement.
- I. Upon delivery to the jobsite, materials and products shall be inspected for compliance with the Project Specifications.
1. Nonconforming materials, products, equipment, hardware, tools and/or safety devices shall be removed immediately from the general work area and stored within a secured area approved by the Owner as "NON CONFORMING MATERIALS AREA" to ensure that defective or nonconforming materials are not incorporated into or used on the project
 2. Materials or products shall not be removed from the designated area until they are deemed by the Architect to be in compliance, or until they are modified or fixed to

FIELD QUALITY CONTROL PROCEDURES
SECTION 01 4516
3595001

meet the project specifications, or until they are removed from the jobsite for the purposes of disposal or shipment back to the manufacturer.

1.10 CONTRACTORS TESTING AGENCY

- A. Qualifications: At Contractor's expense, provide an independent testing laboratory nationally recognized according to 29 CFR 1910.7 and accredited according to NIST's National Voluntary Laboratory Accreditation Program (NVLAP,) or other independent agency with the experience and capability to conduct testing and inspecting indicated, documented according to ASTM E329; with additional qualifications specified in individual Sections; and, where required, that is acceptable to authorities having jurisdiction.
- B. Testing Agency shall cooperate with Architect, Construction Manager, Owner's Project Inspector, and Contractor in performance of duties.
- C. Testing Agency shall provide qualified personnel to perform required tests and inspections.
- D. Testing Agency shall not be authorized to release, revoke, alter, or increase the Contract Document requirements, approve or accept any portion of the Work, or perform any duties of Contractor.

1.11 TESTS AND INSPECTIONS

- A. Preconstruction Testing: Where preconstruction testing is specified to verify performance requirements, comply with the following as applicable:
 - 1. Contractor Responsibilities:
 - a. Provide test specimens representative of proposed products and construction.
 - b. Submit specimens in a timely manner with sufficient time for testing and analyzing results to prevent delaying the Work.
 - c. Provide sizes and configurations of test assemblies, mockups, and laboratory mockups to adequately demonstrate capability of products to comply with performance requirements.
 - d. Build site-assembled test assemblies and mockups using installers who will perform same tasks for Project.
 - e. Build laboratory mockups at testing facility using personnel, products, and methods of construction indicated for the completed Work.
 - f. When testing is complete, remove test specimens, assemblies, and mockups; do not reuse products on Project unless approved by Architect in writing.
- B. Tests and Inspections indicated in individual Specification Sections shall be conducted by a qualified Testing Agency. The responsibilities of the Testing Agency shall be as follows:

FIELD QUALITY CONTROL PROCEDURES
SECTION 01 4516
3595001

1. Verifying that manufacturer maintains detailed fabrication and quality-control procedures and reviews the completeness and adequacy of those procedures to perform the Work.
 2. Notifying Architect, Construction Manager, Owner's Project Inspector, and Contractor promptly of irregularities and deficiencies observed in the Work during performance of its services.
 3. Submit a certified written report of each test, inspection, and similar quality-control service to Architect, Construction Manager, and Owner's Project Inspector with copy to Contractor and to DSA.
 4. Submit a final report of tests and inspections at Substantial Completion which includes a list of unresolved deficiencies.
 5. Interpret tests and inspections and stating in each report whether tested and inspected work complies with or deviates from the Contract Documents.
 6. Retest and reinspect corrected work.
- C. Monitoring and Documentation: Contractor shall maintain testing and inspection reports including log of approved and rejected results as specified in Part 3.
1. Include work Architect has indicated as nonconforming or defective.
 2. Indicate corrective actions taken to bring nonconforming work into compliance with requirements.
 3. Comply with requirements of the California Division of the State Architect (DSA).

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 NOTIFICATIONS

- A. Contractor shall provide the following notifications;
1. Owner's Project Inspector writing:
 - a. 24 hours in advance of starting new Work
 - b. 24 hours in advance of each test or inspection
 2. 48 hours' prior notice, minimum, to the Testing Agency for required tests and inspections.

3.2 TEST AND INSPECTION FIELD BINDER

- A. Contractor shall maintain in the Field Office a Test and Inspection Field Binder that includes a hard copy of the following documents:
1. Approved Quality Control Plan.
 2. Specification Sections that apply to the respective portions of work.
 3. RFI's, CCD's or other approved document that changes the work.

4. Manufacturer's Installation Instructions (MII).
5. Specific details of the Work as requested by the Inspector.
6. Test and Inspection Log.

3.3 TEST AND INSPECTION LOG

- A. Prepare and maintain a record of tests and inspections using an electronic spreadsheet.
- B. Include the following information:
 1. Date test or inspection was conducted.
 2. Description of the Work tested or inspected.
 3. List pertinent detail/sheet number.
 4. List pertinent Specification Section.
 5. Attach manufacturer's installation inspections if applicable.
 6. List and attach RFI's, ASI's or CCD's affecting the Work.
 7. Date Inspector verified work is acceptable.
- C. Final record for each test and inspection shall be submitted on Contractors letterhead and include the name of the responsible person to verify Work was in accordance with the approved Contract Documents.

3.4 MANUFACTURERS' FIELD SERVICES

- A. When specified in respective Specification Sections, Contractor shall require supplier or manufacturer to provide qualified personnel to observe field conditions, conditions of surfaces and installation, quality of workmanship, start-up of equipment, testing, adjusting and balancing of equipment as applicable, and to make appropriate recommendations. Contractor is responsible for proper notification of manufacturer's representative before installation of applicable work and for obtaining necessary inspection certificate stating that installation was observed and approved.
- B. Product Performance Verification: The supplier of products specified based on performance criteria shall, at the request of the Agency, inspect the installed product and certify conformance of the product to specified criteria under the installed conditions.
- C. Manufacturer's representative shall submit written report to the Architect listing observations and recommendations.

3.5 TOLERANCES - GENERAL

- A. Monitor tolerance control of installed products or portions to produce acceptable Work. Do not permit tolerances to accumulate.
- B. Comply with manufacturers' tolerances. Should manufacturers' tolerances conflict with Contract Documents, request clarification from Architect before proceeding.
- C. Adjust products to appropriate dimensions; position before securing products in place.

FIELD QUALITY CONTROL PROCEDURES
SECTION 01 4516
3595001

3.6 DIMENSIONING AND TOLERANCES FOR ACCESSIBILITY

- A. While it is recognized that construction practices generally permit a level of reasonable dimensional tolerance, the installation of items subject to compliance with the Americans with Disabilities Act Accessibility Guidelines and Chapter 11B of the California Building Code, typically does not allow such tolerances. Therefore, these dimensions are to be considered absolute and will be strictly enforced. Items found to be out of tolerance may require modification and/or replacement at Contractor's expense.

3.7 REPAIR AND PROTECTION

- A. On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.
 - 1. Provide materials and comply with installation requirements specified in other Specification Sections or matching existing substrates and finishes.
 - 2. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible. Comply with the Contract Document requirements for cutting and patching in Section 01 7329, Cutting and Patching.
- B. Protect construction exposed by or for quality-control service activities.
- C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

END OF SECTION

p:\sacramento\3595 tracy unified school district\001-000_villalovoz es new shade structures\08 specifications\06 spec\04 final\freiler - shade struct\01 4516_field quality control procedures.docx
Last Updated: August 28, 2020

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Requirements for Testing Laboratory.
 - 2. Contractor's responsibilities for facilitation of Testing and Inspections.

1.2 RELATED SECTIONS AND DOCUMENTS

- A. Geologic Hazards & Soils Report.
- B. DSA 103 - Structural Test & Inspections List.
- C. Section 13 3423, Relocatable Buildings.
- D. Division 23, Mechanical Work - Testing, adjusting, and balancing of systems.
- E. Section 31 0000, Earthwork.
- F. Individual Specification Sections: Inspections and tests required, and standards for testing.

1.3 REFERENCES

- A. California Administrative Code (CAC), edition as noted on the drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Building Code (CBC), edition as noted on the drawings, as adopted by the California Division of the State Architect (DSA).

1.4 SELECTION AND PAYMENT

- A. Testing laboratory shall be approved by both the Architect and the Division of the State Architect.
- B. Owner will employ and pay for services of an independent testing laboratory to perform specified inspection and testing. Retesting costs for failed tests will be the Contractors responsibility and will be back-charged against the contract.
- C. Under provisions for Relocatable Building construction, Owner limits his exposure to in-plant inspection and testing costs. Refer to other Specification Sections related to such specific construction.
- D. Employment of testing laboratory shall in no way relieve Contractor of obligation to perform work in accordance with requirements of Contract Documents.

TESTING AND INSPECTION SERVICES

SECTION 01 4523

3595001

1.5 LABORATORY REPORTS

- A. After each inspection and test, promptly submit two copies of laboratory report to Owner, Architect, Contractor and DSA.
- B. Include:
 - 1. Date of issue,
 - 2. DSA Application and File numbers,
 - 3. Project title and number,
 - 4. Name of inspector,
 - 5. Date and time of sampling or inspection,
 - 6. Identification of product and Specification Section,
 - 7. Location in the Project,
 - 8. Type of inspection or test,
 - 9. Date of test,
 - 10. Results of test,
 - 11. Conformance with Contract Documents.
- C. When requested by Architect, provide interpretation of test results.

1.6 LIMITS ON TESTING LABORATORY AUTHORITY

- A. Laboratory may not release, revoke, alter or enlarge on requirements of Contract Documents.
- B. Laboratory may not approve or accept any portion of the work.
- C. Laboratory may not assume any duties of Contractor.
- D. Laboratory has no authority to stop the work.

1.7 CONTRACTOR RESPONSIBILITIES

- A. Deliver to laboratory at designated location, adequate samples of materials proposed to be used which require testing, along with proposed mix designs. Allow reasonable time for review and testing.
- B. Arrange for, and coordinate with, laboratory for all required testing and inspection. Provide adequate notice, in advance, for proper scheduling and processing of testing. The Inspector will not be responsible for scheduling or arranging for testing and inspection services.
- C. Cooperate with laboratory personnel, and provide access to the work and to manufacturer's facilities.
- D. Provide incidental labor and facilities to provide access to work to be tested, to obtain and handle samples at the site or at the source of products to be tested, to facilitate tests and inspections, storage and curing of test samples.

TESTING AND INSPECTION SERVICES

SECTION 01 4523

3595001

- E. Notify Architect, Inspector, Structural Engineer (when applicable) and laboratory 24 hours prior to expected time for operations requiring inspection and testing services.

END OF SECTION

*p:\sacramento\3595 tracy unified school district\001-000_villalovoz es new shade structures\08 specifications\06 spec\04 final\freiler
- shade struct\01 4523_testing and inspection services.docx
Last Updated: December 16, 2021*

TEMPORARY FACILITIES AND CONTROLS

PART 1 – GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions;
- B. Special Conditions;
- C. Site Standards; and
- D. Construction Waste Management and Disposal.

1.02 TEMPORARY UTILITIES:

A. Electric Power and Lighting:

- (1) Contractor will pay for power during the course of the Work. To the extent power is available in the building(s) or on the Site, Contractor may use the District's existing utilities by making prearranged payments to the District for the utilities used by Contractor and all Subcontractors. Contractor shall be responsible for providing temporary facilities required to deliver that power service from its existing location in the building(s) or on the Site to point of intended use.
- (2) Contractor shall verify characteristics of power available in building(s) or on the Site. Contractor shall take all actions required to make modifications where power of higher voltage or different phases of current are required. Contractor shall be fully responsible for providing that service and shall pay all costs required therefor.
- (3) Contractor shall furnish, wire for, install, and maintain temporary electrical lights wherever it is necessary to provide illumination for the proper performance and/or observation of the Work: a minimum of 20 foot-candles for rough work and 50 foot-candles for finish work.
- (4) Contractor shall be responsible for maintaining existing lighting levels in the project vicinity should temporary outages or service interruptions occur.

B. Water:

- (1) Contractor shall pay for water used during the course of the Work. Contractor shall coordinate and pay for installation or use of water meter in compliance with local water agency requirements. To the

extent water is then available in the building(s) or on the Site, Contractor may use the District's existing utilities by making prearranged payments to the District for the utilities used by Contractor and all Subcontractors. Contractor shall be responsible for providing temporary facilities required to deliver such utility service from its existing location in the building(s), on the Site, or other location approved by the local water agency, to point of intended use.

- (2) Contractor shall use backflow preventers on water lines at point of connection to District's water supply. Backflow preventers shall comply with requirements of Uniform Plumbing Code.
- (3) Contractor shall make potable water available for human consumption.

C. Sanitary Facilities:

- (1) Contractor shall provide sanitary temporary facilities in no fewer numbers than required by law and such additional facilities as may be directed by the Inspector for the use of all workers. The facilities shall be maintained in a sanitary condition at all times and shall be left at the Site until removal is directed by the Inspector or Contractor completes all other work at the Site.
- (2) Use of toilet facilities in the Work under construction shall not be permitted except by consent of the Inspector and the District.

D. Fire Protection:

- (1) Contractor shall provide and maintain fire extinguishers and other equipment for fire protection. Such equipment shall be designated for use for fire protection only and shall comply with all requirements of the California Fire, State Fire Marshall and/or its designee.
- (2) Where on-site welding and burning of steel is unavoidable, Contractor shall provide protection for adjacent surfaces.

E. Trash Removal:

- (1) Contractor shall provide trash removal on a timely basis. Under no circumstance shall Contractor use District trash service.

F. Field Office:

- (1) If Contractor chooses to provide a field office, it shall be an acceptable construction trailer that is well-lit and ventilated. The construction trailer shall be equipped with shelves, desks, filing cabinet, chairs, and such other items of equipment needed. Trailer and equipment are the property of the Contractor and must be removed from the Site upon completion of the Work.
- (2) Contractor shall provide any additional electric lighting and power required for the trailer. Contractor shall make adequate provisions for heating and cooling as required.

1.03 CONSTRUCTION AIDS:

- A. Plant and Equipment:
 - (1) Contractor shall furnish, operate, and maintain a complete plant for fabricating, handling, conveying, installing, and erecting materials and equipment; and for conveyances for transporting workers. Include elevators, hoists, debris chutes, and other equipment, tools, and appliances necessary for performance of the Work.
 - (2) Contractor shall maintain plant and equipment in safe and efficient operating condition. Damages due to defective plant and equipment, and uses made thereof, shall be repaired by Contractor at no expense to the District.
- B. None of the District's tools and equipment shall be used by Contractor for the performance of the Work.

1.04 BARRIERS AND ENCLOSURES:

- A. Contractor shall obtain the District's written permission for locations and types of temporary barriers and enclosures, including fire-rated materials proposed for use, prior to their installation.
- B. Contractor shall provide and maintain temporary enclosures to prevent public entry and to protect persons using other buildings and portions of the Site and/or Premises, the public, and workers. Contractor shall also protect the Work and existing facilities from the elements, and adjacent construction and improvements, persons, and trees and plants from damage and injury from demolition and construction operations.
- C. Contractor shall provide site access to existing facilities for persons using other buildings and portions of the Site, the public, and for deliveries and other services and activities.
- D. Tree and Plant Protection:
 - (1) Contractor shall preserve and protect existing trees and plants on the Premises that are not designated or required to be removed, and those adjacent to the Premises.
 - (2) Contractor shall provide barriers to a minimum height of 4'-0" around drip line of each tree and plant, around each group of trees and plants, as applicable, in the proximity of demolition and construction operations, or as denoted on the Plans.
 - (3) Contractor shall not park trucks, store materials, perform Work or cross over landscaped areas. Contractor shall not dispose of paint thinners, water from cleaning, plastering or concrete operations, or other deleterious materials in landscaped areas, storm drain systems, or sewers. Plant materials damaged as a result of the performance of the Work shall, at the option of the District and at Contractor's expense, either be replaced with new plant materials equal in size to

those damaged or by payment of an amount representing the value of the damaged materials as determined by the District.

- (4) Contractor shall remove soil that has been contaminated during the performance of the Work by oil, solvents, and other materials which could be harmful to trees and plants, and replace with good soil, at Contractor's expense.
- (5) Excavation around Trees:
 - (a) Excavation within drip lines of trees shall be done only where absolutely necessary and with written permission from the District.
 - (b) Where trenching for utilities is required within drip lines, tunneling under and around roots shall be by hand digging and shall be approved by the District. Main lateral roots and taproots shall not be cut. All roots 2 inches in diameter and larger shall be tunneled under and heavily wrapped with wet burlap so as to prevent scarring or excessive drying. Smaller roots that interfere with installation of new work may be cut with prior approval by the District. Roots must first be cut with a Vermeer, or equivalent, root cutter prior to any trenching.
 - (c) Where excavation for new construction is required within drip line of trees, hand excavation shall be employed to minimize damage to root system. Roots shall be relocated in backfill areas wherever possible. If encountered immediately adjacent to location of new construction, roots shall be cut approximately 6 inches back from new construction.
 - (d) Approved excavations shall be carefully backfilled with the excavated materials approved for backfilling. Backfill shall conform to adjacent grades without dips, sunken areas, humps, or other surface irregularities. Do not use mechanical equipment to compact backfill. Tamp carefully using hand tools, refilling and tamping until Final Acceptance as necessary to offset settlement.
 - (e) Exposed roots shall not be allowed to dry out before permanent backfill is placed. Temporary earth cover shall be provided, or roots shall be wrapped with four layers of wet, untreated burlap and temporarily supported and protected from damage until permanently relocated and covered with backfill.
 - (f) Accidentally broken roots should be sawed cleanly 3 inches behind ragged end.

1.05 SECURITY:

The Contractor shall be responsible for project security for materials, tools, equipment, supplies, and completed and partially completed Work.

1.06 TEMPORARY CONTROLS:

A. Noise Control:

- (1) Contractor acknowledges that adjacent facilities may remain in operation during all or a portion of the Work period, and it shall take all reasonable precautions to minimize noise as required by applicable laws and the Contract Documents.
- (2) Notice of proposed noisy operations, including without limitation, operation of pneumatic demolition tools, concrete saws, and other equipment, shall be submitted to the District a minimum of forty-eight (48) hours in advance of their performance.

B. Noise and Vibration:

- (1) Equipment and impact tools shall have intake and exhaust mufflers.
- (2) Contractor shall cooperate with District to minimize and/or cease the use of noisy and vibratory equipment if that equipment becomes objectionable by its longevity.

C. Dust and Dirt:

- (1) Contractor shall conduct demolition and construction operations to minimize the generation of dust and dirt, and prevent dust and dirt from interfering with the progress of the Work and from accumulating in the Work and adjacent areas including, without limitation, occupied facilities.
- (2) Contractor shall periodically water exterior demolition and construction areas to minimize the generation of dust and dirt.
- (3) Contractor shall ensure that all hauling equipment and trucks carrying loads of soil and debris shall have their loads sprayed with water or covered with tarpaulins, and as otherwise required by local and state ordinance.
- (4) Contractor shall prevent dust and dirt from accumulating on walks, roadways, parking areas, and planting, and from washing into sewer and storm drain lines.

D. Water:

- (1) Contractor shall not permit surface and subsurface water, and other liquids, to accumulate in or about the vicinity of the Premises. Should accumulation develop, Contractor shall control the water or other liquid, and suitably dispose of it by means of temporary pumps, piping, drainage lines, troughs, ditches, dams, or other methods.

E. Pollution:

- (1) No burning of refuse, debris, or other materials shall be permitted on or in the vicinity of the Premises.
- (2) Contractor shall comply with applicable regulatory requirements and anti-pollution ordinances during the conduct of the Work including, without limitation, demolition, construction, and disposal operations.

F. Lighting:

- (1) If portable lights are used after dark, all light must be located so as not to direct light into neighboring property.

1.07 PUBLICITY RELEASES:

- A. Contractor shall not release any information, story, photograph, plan, or drawing relating information about the Project to anyone, including press and other public communications medium, including, without limitation, on website(s) without the written permission of the District.

PART 2 – PRODUCTS Not used.

PART 3 – EXECUTION Not used.

END OF DOCUMENT

CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions;
- B. Special Conditions; and
- C. Temporary Facilities and Controls.

1.02 SECTION INCLUDES:

- A. Administrative and procedural requirements for the following:
 - (1) Salvaging non-hazardous construction waste.
 - (2) Recycling non-hazardous construction waste.
 - (3) Disposing of non-hazardous construction waste.

1.03 DEFINITIONS:

- A. Construction Waste: Building and site improvement materials and other solid waste resulting from construction, remodeling, renovation, or repair operations. Construction waste includes packaging.
- B. Demolition Waste: Building and site improvement materials resulting from demolition or selective demolition operations.
- C. Disposal: Removal off-site of demolition and construction waste and subsequent sale, recycling, reuse, or deposit in landfill or incinerator acceptable to authorities having jurisdiction.
- D. Recycle: Recovery of demolition or construction waste for subsequent processing in preparation for reuse.
- E. Salvage: Recovery of demolition or construction waste and subsequent sale or reuse in another facility.
- F. Salvage and Reuse: Recovery of demolition or construction waste and subsequent incorporation into the Work.

1.04 PERFORMANCE REQUIREMENTS:

- A. General: Develop waste management plan that results in end-of Project rates for salvage/recycling of sixty-five percent (65%) by weight (or by volume, but not a combination) of total waste generated by the Work.

1.05 SUBMITTALS:

- A. Waste Management Plan: Submit waste management plan within 30 days of date established for commencement of the Work.
- B. Waste Reduction Progress Reports: Concurrent with each Application for Payment, submit copies of report. Include the following information:
 - (1) Material category.
 - (2) Generation point of waste.
 - (3) Total quantity of waste in tons or cubic yards.
 - (4) Quantity of waste salvaged, both estimated and actual in tons or cubic yards.
 - (5) Quantity of waste recycled, both estimated and actual in tons or cubic yards.
 - (6) Total quantity of waste recovered (salvaged plus recycled) in tons or cubic yards.
 - (7) Total quantity of waste recovered (salvaged plus recycled) as a percentage of total waste.
- C. Waste Reduction Calculations: Before request for final payment, submit copies of calculated end-of-Project rates for salvage, recycling, and disposal as a percentage of total waste generated by the Work.
- D. Records of Donations: Indicate receipt and acceptance of salvageable waste donated to individuals and organizations. Indicate whether organization is tax exempt.
- E. Records of Sales: Indicate receipt and acceptance of salvageable waste sold to individuals and organizations. Indicate whether organization is tax exempt.
- F. Recycling and Processing Facility Records: Indicate receipt and acceptance of recyclable waste by recycling and processing facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.
- G. Landfill and Incinerator Disposal Records: Indicate receipt and acceptance of waste by landfills and incinerator facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.

- H. Qualification Data: For Waste Management Coordinator.
- I. Submittal procedures and quantities are specified in Document 01 33 00.

1.06 QUALITY ASSURANCE:

- A. Waste Management Coordinator Qualifications: LEED Accredited Professional by U.S. Green Building Council.
- B. Regulatory Requirements: Comply with hauling and disposal regulations of authorities having jurisdiction.
- C. Waste Management Conference: Conduct conference at Project site to comply with requirements. Review methods and procedures related to waste management including, but not limited to, the following:
 - (1) Review and discuss waste management plan including responsibilities of Waste Management Coordinator.
 - (2) Review requirements for documenting quantities of each type of waste and its disposition.
 - (3) Review and finalize procedures for materials separation and verify availability of containers and bins needed to avoid delays.
 - (4) Review procedures for periodic waste collection and transportation to recycling and disposal facilities.
 - (5) Review waste management requirements for each trade.

1.07 WASTE MANAGEMENT PLAN:

- A. General: Develop plan consisting of waste identification, waste reduction work plan, and cost/revenue analysis. Indicate quantities by weight or volume, but use same units of measurement throughout waste management plan.
- B. Waste Identification: Indicate anticipated types and quantities of site-clearing and construction waste generated by the Work. Include estimated quantities and assumptions for estimates.
- C. Waste Reduction Work Plan: List each type of waste and whether it will be salvaged, recycled, or disposed of in landfill or incinerator. Include points of waste generation, total quantity of each type of waste, quantity for each means of recovery, and handling and transportation procedures.
 - (1) Salvaged Materials for Reuse: For materials that will be salvaged and reused in this Project, describe methods for preparing salvaged materials before incorporation into the Work.

- (2) Salvaged Materials for Sale: For materials that will be sold to individuals and organizations, include list of their names, addresses, and telephone numbers.
- (3) Salvaged Materials for Donation: For materials that will be donated to individuals and organizations, include list of their names, addresses, and telephone numbers.
- (4) Recycled Materials: Include list of local receivers and processors and type of recycled materials each will accept. Include names, addresses, and telephone numbers.
- (5) Disposed Materials: Indicate how and where materials will be disposed of. Include name, address, and telephone number of each landfill and incinerator facility.
- (6) Handling and Transportation Procedures: Include method that will be used for separating recyclable waste including sizes of containers, container labeling, and designated location on Project site where materials separation will be located.

PART 2 - PRODUCTS Not Used.

PART 3 - EXECUTION

3.01 PLAN IMPLEMENTATION:

- A. General: Implement approved waste management plan. Provide handling, containers, storage, signage, transportation, and other items as required to implement waste management plan during the entire duration of the Contract.
 - (1) Comply with Document 01 50 00 for operation, termination, and removal requirements.
- B. Training: Train workers, subcontractors, and suppliers on proper waste management procedures, as appropriate for the Work occurring at Project site.
 - (1) Distribute waste management plan to everyone concerned within 3 days of submittal return.
 - (2) Distribute waste management plan to entities when they first begin work on site. Review plan procedures and locations established for salvage, recycling, and disposal.
- C. Site Access and Temporary Controls: Conduct waste management operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.

- (1) Designate and label specific areas of Project site necessary for separating materials that are to be salvaged, recycled, reused, donated, and sold.
- (2) Comply with Document 01 50 00 for controlling dust and dirt, environmental protection, and noise control.

3.02 RECYCLING CONSTRUCTION WASTE:

- A. General: Recycle paper and beverage containers used by on-site workers.
- B. Recycling Incentives: Revenues, savings, rebates, tax credits, and other incentives received for recycling waste materials shall accrue to the Contractor.
- C. Procedures: Separate recyclable waste from other waste materials, trash, and debris. Separate recyclable waste by type at Project site to the maximum extent practical.
 - (1) Provide appropriately marked containers or bins for controlling recyclable waste until they are removed from Project Site. Include list of acceptable and unacceptable materials at each container and bin.
 - (a) Inspect containers and bins for contamination and remove contaminated materials if found.
 - (2) Stockpile processed materials on site without intermixing with other materials. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
 - (3) Stockpile materials away from construction area. Do not store within drip line of remaining trees.
 - (4) Store components off the ground and protect from the weather.
 - (5) Remove recyclable waste off District property and transport to recycling receiver or processor.
- D. Packaging:
 - (1) Cardboard and Boxes: Break down packaging into flat sheets. Bundle and store in a dry location.
 - (2) Polystyrene Packaging: Separate and bag material.
 - (3) Pallets: As much as possible, require deliveries using pallets to remove pallets from Project Site. For pallets that remain on Site, break down pallets into component wood pieces and comply with requirements for recycling wood.
 - (4) Crates: Break down crates into component wood pieces and comply with requirements for recycling wood.

- E. Site-Clearing Wastes: Chip brush, branches, and trees on site.
- F. Wood Materials:
 - (1) Clean Cut-Offs of Lumber: Grind or chip into small pieces.
 - (2) Clean Sawdust: Bag sawdust that does not contain painted or treated wood.

3.03 DISPOSAL OF WASTE:

- A. General: Except for items or materials to be salvaged, recycled, or otherwise reused, remove waste materials from Project Site and legally dispose of them in a landfill or incinerator acceptable to authorities having jurisdiction.
 - (1) Except as otherwise specified, do not allow waste materials that are to be disposed of accumulate on site.
 - (2) Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
- B. Burning: Do not burn waste materials.
- C. Disposal: Transport waste materials off District property and legally dispose of them.

END OF DOCUMENT

FIELD OFFICES

PART 1 – GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions;
- B. Special Conditions; and
- C. Temporary Facilities and Controls.

1.02 SECTION INCLUDES:

- A. Requirements for Field Offices and Field Office Trailers.

1.03 SUMMARY:

- A. General: Contractor shall provide District's Field Office Trailer and contents, for District's use exclusively, during the term of the Contract.
- B. Property: Trailer, furniture, furnishings, equipment, and the like, supplied by the Contractor with the Office Trailer shall remain the property of the Contractor; District property items installed, delivered, and the like by District within the Office Trailer will remain District's property.
- C. Modifications: District reserves the right to modify the trailer or contents, or both, as may be deemed proper by District.
- D. Condition: Trailer and contents shall be clean, neat, substantially finished, in good, proper, and safe condition for use, operation, and the like; the trailer and contents shall not be required to be new.
- E. Installation Timing: Provide safe, fully furnished, functional, proper, complete, and finished trailer properly ready for entire use, within fourteen (14) calendar days of District's notification of the issuance of Notice to Proceed.

1.04 SUBMITTALS:

- A. General: Submit submittals to District in quantity, format, type, and the like, as specified herein.
- B. Office Trailer Data: One (1) copy of manufacturer's descriptive data, technical descriptions, regulatory compliance, industry standards, installation, removal, and maintenance instructions.

- C. Equipment Data: Two (2) copies of manufacturer data for each type of equipment, if directed by District.
- D. Furniture and Furnishings Data: Two (2) copies of manufacturer data for each type of equipment, if directed by District.
- E. Plans: One (1) reproducible copy of appropriately scaled plans of trailer layout. Plans shall include, but not be limited to: lighting; furniture; equipment; telephone and electrical outlets; and the like.
- F. Product Samples: One (1) complete and entire unit of each type, if directed by District.

1.05 QUALITY ASSURANCE

- A. Standards: In the event that provisions of codes, regulations, safety orders, Contract Documents, referenced manufacturer's specifications, manufacturer's instructions, industry standards, and the like, are in conflict, the more restrictive and higher quality shall govern.
- B. Installer: Installer or Installers engaged by Contractor must have a minimum of five (5) years of documented and properly authenticated successful experience of specialization in the installation of the items or systems, or both, specified herein.
- C. Manufacturer: Contractor shall obtain products from nationally and industry recognized Manufacturer with five (5) years minimum, of immediately recent, continuous, documented and properly authenticated successful experience of specialization in the manufacture of the product specified herein.
- D. State Personnel Training: Provide proper training for maintenance and operations, including emergency procedures, and the like, as directed by District.
- E. Units: Shall be sound and free of defects, and shall not include any damage or defect that will impair the safety, installation, performance, or the durability of the entire Office Trailer and appurtenant systems.

1.06 REGULATORY REQUIREMENTS

- A. General: Work shall be executed in accordance with applicable Codes, Regulations, Statutes, Enactments, Rulings, Laws, each authority having jurisdiction, and including, but not limited to, Regulatory Requirements specified herein.
- B. California Building Standards Code ("CBSC").
- C. California Code of Regulations, Title 25, Chapter 3, Sub Chapter 2, Article 3 ("CCR").
- D. Coach Insignia: Trailer shall display California Commercial Coach Insignia; such insignia shall be deemed to show that the trailer is in accordance with the Construction and Fire Safety requirements of CCR.

PART 2 – PRODUCTS

2.01 FIELD OFFICE TRAILER

- A. General: Provide entire Field Office Trailer of type, function, operation, capacity, size, complete with controls, safety devices, accessories, and the like, for proper and durable installation. Partitions, walls, ceiling, and other interior and exterior surfaces shall be appropriately finished, including, but not limited to, trim, painting, wall base, floor covering, suspended or similar ceiling, and the like; provide systems, components, units, nuts, bolts, screws, anchoring devices, fastening devices, washers, accessories, adhesives, sealants, and other items of type, grade, and class required for the particular use, not identified but required for a complete, weather-tight, appropriately operating, and finished installation.
- B. Manufacturers: General Electric Capital Modular Space; The Space Place, Inc.; or equal.
- C. Program: Provide a wheel-mounted trailer with stairs, landings, platforms, ramps, and the like, in good, proper, safe, clean, and properly finished condition; with proper heavy duty locks, and other proper and effective security at all doors, windows, and the like. Trailer shall be maintained in good, proper, safe, clean, and properly finished condition during the Contract.
 - (1) Nominal Trailer Size: Four hundred eighty (480) square feet, minimum.
 - (2) Stairs, Platform: Properly finished stairs, platforms, and ramps.
 - (3) Doors: Two (2), three (3) foot wide exterior doors with locksets; finished ramp, steps, and entry platform at each exterior door.
 - (4) Keys: Submit five (5) keys for each door, window, furniture unit, and the like. There shall be no other key copies or originals available; each key shall be identified for District; and shall be labeled, or tagged
 - (5) Lighting: Sixty-five (65) foot-candles illumination minimum at any point, at thirty (30) inches above finished floor throughout from fluorescent light source, exclusively, or as directed by District.
 - (6) Electrical Outlets: One (1) duplex outlet evenly spaced every twelve (12) linear horizontal feet of wall face, and electrical service ready for use.

2.02 FIELD OFFICE TRAILER ITEMS

- A. General: Provide the Field Office Trailer with the following arranged into two (2) workstations:
 - (1) Desks: Two (2) desks: thirty-six (36) inches by sixty (60) inches; steel, laminated plastic top; locking, one (1) or two (2) file drawers single pedestal; steel; provide five (5) keys to District.

- (2) Tables: Two (2) tables; thirty-six (36) inches by sixty (60) inches; twenty-nine (29) inches high; steel, laminated plastic top tables; one (1) at each desk.
 - (3) Chairs: Two (2) chairs: swivel; steel; with seat cushion and arms; one (1) at each desk.
 - (4) Waste Baskets: Two (2) waste baskets, one at each desk.
- B. Furniture and Equipment: Provide in the space located to effect efficient and logical use.
- (1) File cabinet: One (1); four (4) drawer; lateral; steel locking.
 - (2) Plan Table: One (1) plan table: thirty-six (36) inches deep by seventy-two (72) inches wide by forty-two (42) inches high; adjustable; wood or steel; with lockable plan and pencil drawers.
 - (3) Drafting Stool: One (1) drafting stool; swiveling; steel; padded; adjustable; with footrest and casters.
 - (4) Bookshelf: One (1) bookshelf: thirty-six (36) inches deep by seventy-two (72) inches wide by forty-two (42) inches high; adjustable; wood or steel; with lockable plan and pencil drawer.
 - (5) Plan Rack: One (1) wheel mounted plan rack.
 - (6) Waste Baskets: One (1) large waste basket.
 - (7) Coat/Hat Hanger: Wall mounted with minimum capacity for four (4) garments and ten (10) hats.
 - (8) Document Management System: Shall include an integrated high-volume printer, copier, and facsimile machine, including stand, base, and storage cabinet; and shall include the following features:
 - (a) Type: Laser, dry electrostatic transfer, plain paper, digital, multi-function imaging system.
 - (b) Network: Ethernet or Token Ring network ready, Plug-and-Play.
 - (c) Print, send/receive facsimile from any connected workstation.
 - (d) Resolution: Six hundred (600) dots per inch by six hundred (600) dots per inch, minimum.
 - (e) Print Speed: Twenty (20) pages per minute, minimum.
 - (f) Copies: Twenty (20) copies per minute, minimum.
 - (g) Document Handler: Forty (40) sheet, minimum

- (h) Collator: Forty (40) bin, minimum, with stapling.
- (i) Duplexing: Capable.
- (j) Paper Size: Capable of handling paper sizes to eleven (11) inches by seventeen (17) inches.
- (k) Paper Cassettes: One (1) each for eight and one half (8.5) inches by eleven (11) inches, eight and one half (8.5) inches by fourteen (14) inches, and eleven (11) inches by seventeen (17) inches paper sizes; minimum two hundred fifty (250) sheets per cassette.
- (l) Reduction/Enlargement: Capable of reduction to twenty-five percent (25%) and enlargement to two hundred percent (200%).
- (m) Facsimile Electronic Storage: Capable of storing minimum of fifty (50) speed dial numbers, group faxing and broadcast faxing.
- (n) Facsimile Scanning: Capable of scanning into memory a minimum of one hundred (100) pages with maximum scan time of three (3) seconds per page.
- (o) Halftone: Sixty-four (64) levels.
- (p) Redial: Automatic and Manual.
- (9) Maintenance: Contractor shall purchase service agreements for each unit of equipment for the duration of the project plus two (2) months, and shall maintain all equipment in proper working condition. Service agreements shall include provision for replacement of toner cartridges and other items required to effect proper unit use. Service agreements shall also provide for:
 - (a) Unlimited Service Calls.
 - (b) Same Day Response.
 - (c) All parts, labor, preventative maintenance and mileage.
 - (d) All chemicals, such as toner, fixing agent, and the like.
 - (e) System training and setup.
- (10) Portable Toilets: Two (2); each shall include a urinal; each unit shall be a properly enclosed chemical unit conforming to ANSI Z4.3.
 - (a) Location: As directed by District.
 - (b) Maintenance: Maintain each unit and surrounding areas in a clean, hygienic and orderly manner, at all time. Empty, clean,

and sanitize each unit each day at a location and time as directed by District.

- (c) Removal: Relocate, or remove from the site, each Portable Toilet. Upon such directive by District, the Contractor shall forthwith relocate or remove each Portable Toilet and submit the affected areas to a condition which existed prior to the installation of each Portable Toilet, within three (3) calendar days, or as directed by District in writing, at no cost to District.

2.03 UTILITY AND SERVICES

- A. Telephone Service: Contractor shall provide and interface the entire telephone service, and shall properly and timely pay for telephone service for District's non-long-distance use.
- B. Electrical Service: Provide all proper connections and continuously pay for service for the duration of the Work.

2.04 FINISHES

- A. General: Manufacturer standard finish system over surfaces properly cleaned, pretreated, and prepared to obtain proper bond; all visible surfaces shall be coated.
- B. Finish: Color as selected by District from manufacturer standard palette.

PART 3 – EXECUTION

3.01 INSTALLATION

- A. General: Properly prepare area and affected items to receive the Work. Set Work accurately in location, alignment, and elevation; rigidly, securely, and firmly anchor to appropriate structure; install plumb, straight, square, level, true, without racking, rigidly anchored to proper solid blocking, substrate, and the like; provide appropriate type and quantity of reinforcements, fasteners, adhesives, self-adhesive and other tapes; lubricants, coatings, accessories, and the like, as required for a complete, structurally rigid, stable, sound, and appropriately finished installation, in accordance with manufacturer's published instructions, and as indicated. The more restrictive and higher quality requirement shall govern. Moving parts shall be properly secured, without binding, looseness, noise, and the like.
- B. Installation: Install in accordance with 25 CCR 3.2.3 and as directed by District; jack up trailer and level both ways; mount on proper concrete piers with all load off wheels; provide required tie down and accessories per Section 4368 of referenced CCR, and as directed by District.
- C. Rejected Work: Work, materials, unit, items, systems, and the like, not accepted by District shall be deemed rejected, and shall forthwith be removed and replaced with proper and new Work, materials, unit, items, systems, and the like at no cost to District.

- D. Standard: Comply with manufacturer's published instructions, or with instructions as shown or indicated; the more restrictive and higher quality requirement shall govern.
- E. Location: As directed by District.
- F. Fire Resistance: Construct and install in accordance with UL requirements.
- G. Maintenance: Contractor shall maintain trailer and adjacent areas in a safe, clean and hygienic condition throughout the duration of the Work, and as directed by District. Properly repair or replace furniture or other items, as directed by District. Properly remove unsafe, damaged, or broken furniture, or similar items, and replace with safe and proper items. Contractor shall pay cost of all services, repair, and maintenance, or replacement of each item.
- H. Janitorial Service: Provide professional janitorial services, including, but not limited to, trash, waste paper baskets, fill paper dispensers; clean and dust all furniture, files, and the like; sweep and mop resilient and similar flooring; and vacuum carpeting and similar flooring.
 - (1) Frequency: Two (2) times per week, minimum.
- I. Removal: Properly remove the Office Trailer and contents from the Site upon completion of the Contract, or as directed by District in writing. Forthwith properly patch and repair affected areas; replace damaged items with new items. Carefully and properly inventory, clean, pack, store, and protect District property; submit District property to District at a date, time and location as directed by District.

END OF DOCUMENT

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Protection for existing trees.
 - 2. Repair and replacement of damaged trees.

1.2 RELATED REQUIREMENTS

- A. Section 32 8000, Irrigation.
- B. Section 32 9000, Landscaping.

1.3 REFERENCES AND STANDARDS

- A. American National Standard Institute (ANSI) A300 Pruning Standards.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Submittal Procedures:
 - 1. Action Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
 - 2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.

1.5 ACTION SUBMITTALS

- A. Fenced Tree Protection Area Plan: Submit plan outlining trees listed by number to be protected and their groupings. Trees shall be grouped in their own Fenced Tree Protection Areas as shown in Drawings.
- B. Schedule of Activities Inside Tree Protection Area: Submit in writing a schedule, including any and all activity inside Fenced Tree Protection Areas. This schedule to include but not limited to the dates fences are initially installed, altered and dates of fence replacement. Intent of these provisions is that the Tree Protection Zones (TPZ) are fenced for the entire duration with only exceptions of short intervals or specifically defined construction activity needs. Revise schedule as directed.
- C. Mediation Plan: Submit mediation plan to keep existing trees and planting irrigated during construction.

1.6 CLOSEOUT SUBMITTALS

- A. Maintenance Plan: For replaced trees.

TEMPORARY TREE PROTECTION
SECTION 01 5639
3595001

PART 2 - PRODUCTS

2.1 GENERAL

- A. Use materials as specified; any deviation from the Specifications must first be approved by the Owner's Representative in writing.

2.2 MATERIALS

- A. Trunk Protection constructed of:
 - 1. 20-foot long 2x6 wood boards or length needed to protect the trunk if tree trunk is shorter than 20 feet in height.
 - 2. Metal wire. Gauge strong enough to tie the boards around the trunk of the tree.
- B. Tree Protection Zone Fencing:
 - 1. 6-foot-tall metal chain link construction fencing.
- C. Bark Mulch: Untreated, shredded cedar.

PART 3 - EXECUTION

3.1 GENERAL REQUIREMENTS FOR TREES BE RETAINED

- A. Maintain pre-existing moisture levels.
- B. Maintain areas inside the fenced tree protection area including lawn mowing, leaf removal, operation and repair of irrigation.
- C. Protect root systems from flooding, erosion, excessive watering and drying resulting from dewatering or other operations:
- D. Operations not Allowed:
 - 1. Run off or spillage of damaging materials in vicinity of root systems.
 - 2. Rinsing of tools or equipment under trees.
 - 3. Storage of materials, stockpile soil, park or drive vehicles within drip lines.
 - 4. Cutting, breaking skin or bark, or bruising roots or branches.
 - 5. Fires under and adjacent trees.
 - 6. Discharge exhaust under foliage.
 - 7. Securing cable, chain, or rope to trees.
 - 8. Change of grade within drip line of trees without Landscape Architect's approval.
 - 9. The use of lime.

3.2 TREE TRUNK PROTECTION

- A. Conform to requirements for trees to be retained, in accordance with article GENERAL REQUIREMENTS FOR TREES TO BE RETAINED.
- B. Install boards vertically around tree and bind together with wire to protect the bark 360 degrees around the entire tree prior to start of any demolition and construction. Boards are not to dig into bark.
- C. Major scaffold limbs may require plastic fencing to be wrapped around them for protection.

3.3 TREE DRIPLINE PROTECTION

- A. The Tree Protection Zone (TPZ) is a restricted area around the base of the tree with a radius of one foot (1') for every inch of tree trunk diameter or ten feet, which ever is greater, enclosed by 6' tall chain link fence unless otherwise directed.
- B. Signage designating the protection zone and penalties for violations shall be secured in prominent location on each protection fence.

3.4 TREE PROTECTION

- A. Duration: Tree protection shall be erected before demolition, grading, or any construction begins and remain in place until final inspection of the project.
- B. Conform to requirements for trees and plants to be retained, in accordance with article GENERAL REQUIREMENTS FOR TREES TO BE RETAINED.
- C. Construction shall not commence until approval of the Fenced Tree Protection Area Plan and Schedule of Activities Inside Tree Protection Area have been obtained from the Architect.
- D. Vehicle movement within the TPZ will only be allowed for construction equipment.
 - 1. Within dripline, apply 10-inch layer of mulch over geotextile fabric.
- E. Perform trenching operations within the TPZ of the tree so that:
 - 1. Digging shall be by hand using narrow trenching shovel.
 - 2. No roots larger than 2" diameter are cut and utilities are routed around or below them.
 - 3. Roots smaller than 2" diameter are cut with sharp tools, saws, loppers; not torn, chopped or broken.
- F. Where roots are exposed:
 - 1. Do not allow the roots to dry out.
 - 2. On the same day the excavation is made, provide temporary backfill to original grade at tree roots,

TEMPORARY TREE PROTECTION
SECTION 01 5639
3595001

- 3. Or cover roots with 4 layers of wet untreated burlap, made wet each day, including weekends.
- G. Roots larger than 3" in diameter are not to be cut without review and approval by an Arborist provided by Owner.

3.5 REPAIR AND REPLACEMENT OF TREES

- A. Repair or replace damaged trees as required or directed.
- B. Repair trees damaged by operations:
 - 1. within 24 hours of damage,
 - 2. to satisfaction of Landscape Architect,
 - 3. to ANSI A300 Pruning Standards.
- C. Replace repaired trees where repair has not restored them to health or aesthetics:
 - 1. within 6 months of request to replace,
 - 2. to the satisfaction of Landscape Architect,
 - 3. with replacement trees of a size and variety matching those that were removed,
- D. Replaced trees shall be maintained in good health and aesthetics for the duration of the project from installation.
 - 1. Submit comprehensive maintenance plan for replacement trees, including but not limited to provisions for irrigation system independent of existing system.
- E. Where suitable replacement of trees is not available:
 - 1. Submit affidavit to Landscape Architect that they are not available.
 - 2. Provide compensation to Owner at the following rates:
 - a. \$2000 for each caliper inch of tree removed under 12 inches.
 - b. \$4000 for each caliper inch of tree removed 12 inches or greater.
 - c. Caliper of trees measured at 6 inches above grade.
 - d. Caliper defined here as thickness of diameter, measured in inches.

3.6 SOIL CONTAMINATION

- A. Remove soil that has been contaminated during the performance of the Work by oil, solvents, and other materials which could be harmful to trees and plants.

TEMPORARY TREE PROTECTION
SECTION 01 5639
3595001

1. Replace with good soil in conformance with Section 31 0000, Earthwork, at Contractor's expense.

END OF SECTION

*p:\sacramento\3595 tracy unified school district\001-000_villalovoz es new shade structures\08 specifications\06 spec\04 final\freiler
- shade struct\01 5639_temporary tree protection.docx
New File: January 6, 2022*

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Requirements for preparing Storm Water Pollution Prevention Plan.

1.2 SCOPE OF WORK

A. General: Provide all materials, equipment and labor necessary to furnish and install straw wattles or silt fence barriers at locations shown on the Drawings and as required during construction.

B. The Contractor shall as a minimum address:

1. Cut and fill operations.
2. Temporary stockpiles.
3. Vehicle and equipment storage, maintenance and fueling operations.
4. Concrete, plaster, mortar and paint disposal.
5. Dust control.
6. Tracking of dirt, mud on off-site streets.
7. Pipe flushing.

1.3 ADMINISTRATIVE REQUIREMENTS

A. Submittal Procedures:

B. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures

1.4 QUALITY ASSURANCE

A. General: Comply with governing codes and regulations.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Straw Wattles: New manufactured straw roles in compliance with state requirements for sediment control.

B. Silt Fences: New manufactured silt fence in compliance with state requirements for sediment control.

C. Filter Bag: As required by local jurisdiction.

**EROSION CONTROL
SECTION 01 5713.10
3595001**

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Straw Wattles: Install per the drawings and/or as required.
- B. Silt Fences: Install per the Drawings and/or as required. Silt Fences shall not be used around inlets.
- C. Filter Bags: Installed as required by manufacturer's requirements.

3.2 MAINTENANCE AND REMOVAL:

- A. General: Maintain and repair existing and new erosion control facilities throughout the construction period. Remove silt build up at straw wattles and/or silt fences as needed. Repair damage to earth slopes and banks. Erosion control measures shall be left in place until final paving and landscaping are complete.
- B. Monitoring: Provide monitoring of erosion control measures before and after storm events.
- C. Cleaning: Keep area clean of debris.
- D. Remove erosion control measures prior to placing finish landscaping.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: VOC restrictions for product categories listed below under Article "DEFINITIONS" and in compliance with the following.
 - 1. California Code of Regulations, Title 24, Part 11 California Green Building Standards Code.
 - 2. Local Agency Division of the State Architect.
 - 3. No Rating System is applicable.
- B. Products of each category that are installed in the project must comply; applicable laws and ordinances do not allow for partial compliance.
- C. Listing of a product in these Specifications shall not be construed as a solicitation or requirement to use any product or combination of products in violation of the requirements of South Coast Air Quality Management District Rule No.1168, as described in Rule 1168(g).
 - 1. If a listed product does not meet the requirements of this rule, request approval for use of an alternate product by the same or another manufacturer meeting the requirements of this rule.
 - 2. Do not use products which do not meet the requirements of this rule.

1.2 RELATED REQUIREMENTS

- A. Divisions 01 through 33 contain related requirements specific to the work of each of these Sections. Requirements may or may not include reference to this Section.
- B. Section 01 8113, Sustainable Design Requirements, for CAL-Green general requirements and procedures.

1.3 REFERENCES

- A. California Green Building Standards Code (CALGreen), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. Low-Emitting Materials Product List; California Collaborative for High Performance Schools (CHPS); current edition at www.chps.net/.
- C. CRI (GLCC) - Green Label Testing Program - Approved Product Categories for Carpet Cushion; Carpet and Rug Institute; current edition.
- D. CRI (GLP) - Green Label Plus Carpet Testing Program - Approved Products; Carpet and Rug Institute; current edition.
- E. GEI (SCH) - GREENGUARD "Children and Schools" Certified Products; GREENGUARD Environmental Institute; current listings at www.greenguard.org.

VOLATILE ORGANIC COMPOUND (VOC) RESTRICTIONS

SECTION 01 6116.10

3595001

- F. GreenSeal GS-36 - Commercial Adhesives; Green Seal, Inc.
- G. SCAQMD 1168 - South Coast Air Quality Management District Rule No.1168; current edition; www.aqmd.gov.
- H. SCS (CPD) - SCS Certified Products; Scientific Certification Systems; current listings at www.scs-certified.com.

1.4 DEFINITIONS

- A. VOC-Restricted Products: Products of each of the following categories when installed or applied on-site:
 - 1. Adhesives, sealants, and sealer coatings, regardless of specification Section or Division.
 - 2. Paints and coatings.
 - 3. Carpet and resilient flooring.
 - 4. Composite wood products; plywood, particleboard, wood fiberboard.
- B. Adhesives: Gunnable, trowelable, liquid-applied, and aerosol adhesives, whether specified or not; including flooring adhesives, resilient base adhesives, and pipe jointing adhesives.
- C. Sealants: Gunnable, trowelable, and liquid-applied joint sealants and sealant primers, whether specified or not; including firestopping sealants and duct joint sealers.

1.5 SUBMITTAL REQUIREMENTS

- A. Product Data: For each VOC-restricted product used in the project, submit product data showing compliance, except when another type of evidence of compliance is required.
- B. Verification of Compliance: Submit for each different product in each applicable category.
 - 1. Identify evidence submittals with the words "CALGreen VOC Compliance Report".
- C. Installer Certifications for Accessory Materials:
 - 1. Require each installer of any type of product, not just the products for which VOC restrictions are specified, to certify that either 1) no adhesives, joint sealants, paints, coatings, or composite wood or agrifiber products have been used in the installation of their products, or 2) that such products used comply with these requirements.
 - 2. Use the form following at the end of Part 3 in this Section for Installer certifications.

1.6 QUALITY ASSURANCE

- A. Manufacturer's Testing Agency Qualifications: Independent firm specializing in performing testing and inspections of the type specified in this Section.

PART 2 - PRODUCTS

2.1 MATERIALS

A. General:

1. Provide products conforming to local, State and Federal government requirements limiting the amount of volatile organic compounds contained in the product, for its intended application. If specified product exceeds current requirement, provide conforming product at no additional cost.
2. Provide only products having volatile organic compound (VOC) content not greater than required by South Coast Air Quality Management District Rule No.1168 and less where required by code.
3. Products are specified in multiple Sections throughout these Specifications.

B. Adhesives, Including Carpet and Cushion Adhesives: Comply with CALGreen Section 5.504 and Table 5.504.4.1.

1. Verification of Compliance: Acceptable types are:
 - a. Report of laboratory testing performed in accordance with requirements.
 - b. Published product data showing compliance with requirements.
 - c. Certification by manufacturer that product complies with requirements.
2. Aerosol Adhesives: Comply with Table 5.504.4.1 of CalGreen Section 5.504, and California Code of Regulations Title 17, Section 94507.
 - a. Verification of Compliance: Acceptable types are:
 - 1) Current GreenSeal Certification.
 - 2) Report of laboratory testing performed in accordance with GreenSeal GS-36 requirements.
 - 3) Published product data showing compliance with requirements.
3. Products used shall comply with the following limits.

Table 5.504.4.1 ADHESIVE VOC LIMIT	
Architectural Applications	Current VOC Limit
Indoor Carpet Adhesives	50
Carpet Pad Adhesives	50
Outdoor Carpet Adhesives	150
Wood Flooring Adhesive	100
Rubber Floor Adhesives	60
Subfloor Adhesives	50
Ceramic Tile Adhesives	65
VCT and Asphalt Tile Adhesives	50
Dry Wall and Panel Adhesives	50
Cove Base Adhesives	50
Multipurpose Construction Adhesives	70
Structural Glazing Adhesives	100

VOLATILE ORGANIC COMPOUND (VOC) RESTRICTIONS
SECTION 01 6116.10
3595001

Table 5.504.4.1 ADHESIVE VOC LIMIT	
Single Ply Roof Membrane Adhesives	250
Other adhesives not specifically listed	250
VOC Limits and Effective Dates**	
Specialty Applications	Current VOC Limit
PVC Welding	510
CPVC Welding	490
ABS Welding	325
Plastic Cement Welding	250
Adhesive Primer for Plastic	550
Contact Adhesive	80
Special Purpose Contact Adhesive	250
Structural Wood Member Adhesive	140
Top and Trim Adhesive	250
** The specified limits remain in effect unless revised limits are listed in the current governing edition of CalGreen.	
For adhesives, adhesive bonding primers, or any other primer not regulated by the above two Tables and applied to the following substrates, the following limits shall apply:	
Substrate Specific Applications	Current VOC Limit
Metal to Metal	30
Plastic Foams	50
Porous Material (except wood)	50
Wood	30
Fiberglass 80	80
Note: If an adhesive is used to bond dissimilar substrates together the adhesive with the highest VOC content shall be allowed.	

C. Joint Sealants: Comply with CALGreen Section 5.504 and Table 5.504.4.2.

1. Verification of Compliance: Acceptable types are:
 - a. Report of laboratory testing performed in accordance with requirements.
 - b. Published product data showing compliance with requirements.
 - c. Certification by manufacturer that product complies with requirements.
2. Products used shall comply with the following limits.

Table 5.504.4.2 SEALANT VOC LIMIT	
Less Water and Less Exempt Compounds in Grams per Liter	
Sealant	Current VOC Limit
Architectural	250
Marine Deck	760
Non-Membrane Roof	300
Roadway	250
Single-Ply Roof Membrane	450

VOLATILE ORGANIC COMPOUND (VOC) RESTRICTIONS**SECTION 01 6116.10****3595001**

Table 5.504.4.2 SEALANT VOC LIMIT	
Less Water and Less Exempt Compounds in Grams per Liter	
Other	420
Sealant Primers	Current VOC Limit
Architectural	
Non-Porous	250
Porous	775
Modified Bituminous	500
Marine Deck	760
Other	750
For low-solid adhesives or sealants the VOC limit is expressed in grams per liter of material; for all other adhesives and sealants, VOC limits are expressed as grams of VOC per liter of adhesive or sealant less water and less exempt compounds.	

- D. Paints and Coatings: Comply with CALGreen Section 5.504 and Table 5.504.4.3 based on the California Air Resources Board, Architectural Coatings Suggested Control Measure.
1. Determination of VOC Content: Testing and calculation in accordance with 40 CFR 59, Subpart D (EPA Method 24), exclusive of colorants added to a tint base and water added at Project site; or other method acceptable to authorities having jurisdiction.
 - a. Verification of Compliance: Acceptable types are:
 - 1) Report of laboratory testing performed in accordance with requirements.
 - 2) Published product data showing compliance with requirements.
 - 3) Certification by manufacturer that product complies with requirements.
 2. Provide coatings that comply with the most stringent requirements specified in the following:
 - a. 40 CFR 59, Subpart D--National Volatile Organic Compound Emission Standards for Architectural Coatings.
 - b. South Coast Air Quality Management District Rule No.1168.
 3. Aerosol Paints and Coatings: Comply with CALGreen 5.504.4.3.1 and, for projects in the jurisdiction of BAAQMD, comply with VOC by weight of product limits of regulation 8, Rule 49.
 4. Products used shall comply with the following limits.

Table 5.504.4.3 VOC CONTENT LIMITS FOR ARCHITECTURAL COATINGS	
(See Notes 2 & 3 below)	
Grams of VOC per Liter of Coating, less water and less exempt compounds	
Coating Category	Current VOC Limit 1/1/2012
Flat Coatings	50

VOLATILE ORGANIC COMPOUND (VOC) RESTRICTIONS
SECTION 01 6116.10
3595001

Table 5.504.4.3 VOC CONTENT LIMITS FOR ARCHITECTURAL COATINGS (See Notes 2 & 3 below)	
Grams of VOC per Liter of Coating, less water and less exempt compounds	
Coating Category	Current VOC Limit 1/1/2012
Non-Flat Coatings	100
Non-Flat High Gloss Coatings	150
Specialty Coatings	
Aluminum Roof Coatings	400
Basement Specialty Coatings	400
Bituminous Roof Coatings	50
Bituminous Roof Primers	350
Bond Breakers	350
Concrete Curing Compounds	350
Concrete / Masonry Sealers	100
Driveway Sealers	50
Dry Fog Coatings	150
Faux Finishing Coatings	350
Fire Resistive Coatings	350
Floor Coatings	100
Form-Release Compounds	250
Graphic Arts Coatings (Sign Paints)	500
High-Temperature Coatings	420
Industrial Maintenance Coatings	250
Low Solids Coatings (See Note 1 below)	120
Magnesite Cement Coatings	450
Mastic Texture Coatings	100
Metallic Pigmented Coatings	500
Multicolor Coatings	250
Pretreatment Wash Primers	420
Primers, Sealers and Undercoaters	100
Reactive Penetrating Sealers	350
Recycled Coatings	250
Roof Coatings	50
Rust Preventative Coatings	250
Shellacs:	
Clear	730
Opaque	550
Specialty Primers, Sealers and Undercoaters	100
Stains	250
Stone Consolidants	450
Swimming Pool Coatings	340
Traffic Marking Coatings	100
Waterproofing Membranes	250
Wood Coatings	275
Wood Preservatives	350

VOLATILE ORGANIC COMPOUND (VOC) RESTRICTIONS
SECTION 01 6116.10
3595001

Table 5.504.4.3 VOC CONTENT LIMITS FOR ARCHITECTURAL COATINGS (See Notes 2 & 3 below)	
Grams of VOC per Liter of Coating, less water and less exempt compounds	
Coating Category	Current VOC Limit 1/1/2012
Zinc Rich Primers	340
Note 1: Grams of VOC per liter of coating including water and including exempt compounds	
Note 2: Not Applicable	
Note 3: Values in this table are derived from those specified by the California Air Resources Board, Architectural Coatings Suggested Control Measure, February 1, 2008. More information is available from the Air Resources Board.	

5. Restricted Components: In addition to the specified VOC limits, paints and coatings shall not contain any of the following:
- a. Acrolein.
 - b. Acrylonitrile.
 - c. Antimony.
 - d. Benzene.
 - e. Butyl benzyl phthalate.
 - f. Cadmium.
 - g. Di (2-ethylhexyl) phthalate.
 - h. Di-n-butyl phthalate.
 - i. Di-n-octyl phthalate.
 - j. 1,2-dichlorobenzene.
 - k. Diethyl phthalate.
 - l. Dimethyl phthalate.
 - m. Ethylbenzene.
 - n. Formaldehyde.
 - o. Hexavalent chromium.
 - p. Isophorone.
 - q. Lead.
 - r. Mercury.
 - s. Methyl ethyl ketone.
 - t. Methyl isobutyl ketone.
 - u. Methylene chloride.
 - v. Naphthalene.
 - w. Toluene (methylbenzene).
 - x. 1,1,1-trichloroethane.
 - y. Vinyl chloride.

VOLATILE ORGANIC COMPOUND (VOC) RESTRICTIONS
SECTION 01 6116.10
3595001

PART 3 - EXECUTION

3.1 FIELD QUALITY CONTROL

- A. Owner reserves the right to reject non-compliant products, whether installed or not, and require their removal and replacement with compliant products at no extra cost to Owner.
- B. Additional costs to restore indoor air quality, including fines by authorities, due to installation of non-compliant products shall be borne by Contractor.

3.2 CERTIFICATION FORM

- A. Use of this Form:
 - 1. Because installers are allowed and directed to choose accessory materials suitable for the applicable installation, there is a possibility that such accessory materials might contain VOC content in excess of that permitted, especially where such materials have not been explicitly specified.
 - 2. Contractor is required to obtain and submit this Form from each installer of work on this project.
 - 3. For each product category listed, circle the correct words in brackets: either [HAS] or [HAS NOT].
 - 4. If these accessory materials have been used, attach to this form product data and MSDS sheet for each such product.

(The Remainder of this Page is Intentionally Left Blank)

ACCESSORY MATERIAL VOC CONTENT CERTIFICATION FORM

IDENTIFICATION:

Project Name: _____

Project No.: _____

Architect: _____

PRODUCT CERTIFICATION: I certify that the installation work of my firm on this project:

1. [HAS] [HAS NOT] required the use of any ADHESIVES.
2. [HAS] [HAS NOT] required the use of any JOINT SEALANTS.
3. [HAS] [HAS NOT] required the use of any PAINTS OR COATINGS.
4. [HAS] [HAS NOT] required the use of any COMPOSITE WOOD or AGRIFIBER PRODUCTS.

Product data and MSDS sheets are attached.

CERTIFIED BY (Installer/Manufacturer/Supplier Firm):

Firm Name: _____

Print Name: _____

Signature: _____

Title: _____ (officer of company)

Date: _____

VOLATILE ORGANIC COMPOUND (VOC) RESTRICTIONS
SECTION 01 6116.10
3595001

END OF SECTION

*p:\sacramento\3595 tracy unified school district\001-000_villalovoz es new shade structures\08 specifications\06 spec\04 final\freiler
- shade struct\01 6116.10_volatile organic compound (voc) restrictions.docx
Last Updated: January 18, 2022*

SECTION 01 66 00

PRODUCT DELIVERY, STORAGE AND HANDLING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Site Access, Conditions and Requirements;
- B. Special Conditions.

1.02 PRODUCTS

- A. Products are as defined in the General Conditions.
- B. Contractor shall not use and/or reuse materials and/or equipment removed from existing Premises, except as specifically permitted by the Contract Documents.
- C. Contractor shall provide interchangeable components of the same manufacturer, for similar components.

1.03 TRANSPORTATION AND HANDLING

- A. Contractor shall transport and handle Products in accordance with manufacturer's instructions.
- B. Contractor shall promptly inspect shipments to confirm that Products comply with requirements, quantities are correct, and products are undamaged.
- C. Contractor shall provide equipment and personnel to handle Products by methods to prevent soiling, disfigurement, or damage.

1.04 STORAGE AND PROTECTION

- A. Contractor shall store and protect Products in accordance with manufacturer's instructions, with seals and labels intact and legible. Contractor shall store sensitive products in weather-tight, climate controlled enclosures.
- B. For exterior storage of fabricated Products, Contractor shall place on sloped supports, above ground.
- C. Contractor shall provide off-site storage and protection when Site does not permit on-site storage or protection.

- D. Contractor shall cover products subject to deterioration with impervious sheet covering and provide ventilation to avoid condensation.
- E. Contractor shall store loose granular materials on solid flat surfaces in a well-drained area and prevent mixing with foreign matter.
- F. Contractor shall provide equipment and personnel to store Products by methods to prevent soiling, disfigurement, or damage.
- G. Contractor shall arrange storage of Products to permit access for inspection and periodically inspect to assure Products are undamaged and are maintained under specified conditions.

PART 2 – PRODUCTS Not Used.

PART 3 - EXECUTION Not Used.

END OF DOCUMENT

FIELD ENGINEERING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Site Investigation, and Soils Investigation Report;
- B. Special Conditions;
- C. Site-Visit Certification.

1.02 REQUIREMENTS INCLUDED:

- A. Contractor shall provide and pay for field engineering services by a California-registered engineer, required for the project, including, without limitations:
 - (1) Survey work required in execution of the Project.
 - (2) Civil or other professional engineering services specified, or required to execute Contractor's construction methods.

1.03 QUALIFICATIONS OF SURVEYOR OR ENGINEERS:

Contractor shall only use a qualified licensed engineer or registered land surveyor, to whom District makes no objection.

1.04 SURVEY REFERENCE POINTS:

- A. Existing basic horizontal and vertical control points for the Project are those designated on the Drawings.
- B. Contractor shall locate and protect control points prior to starting Site Work and preserve all permanent reference points during construction. In addition Contractor shall:
 - (1) Make no changes or relocation without prior written notice to District and Architect.
 - (2) Report to District and Architect when any reference point is lost or destroyed, or requires relocation because of necessary changes in grades or locations.
 - (3) Require surveyor to replace Project control points based on original survey control that may be lost or destroyed.

1.05 RECORDS:

Contractor shall maintain a complete, accurate log of all control and survey work as it progresses.

1.06 SUBMITTALS:

- A. Contractor shall submit name and address of Surveyor and Professional Engineer to District and Architect prior to its/their work on the Project.
- B. On request of District and Architect, Contractor shall submit documentation to verify accuracy of field engineering work, at no additional cost to the District.
- C. Contractor shall submit a certificate signed by registered engineer or surveyor certifying that elevations and locations of improvements are in conformance or nonconformance with Contract Documents.

PART 2 – PRODUCTS Not Used.

PART 3 - EXECUTION

3.01 COMPLIANCE WITH LAWS:

Contractor is responsible for meeting all applicable codes, OSHA, safety and shoring requirements.

3.02 NONCONFORMING WORK:

Contractor is responsible for any re-surveying required by correction of nonconforming work.

END OF DOCUMENT

CUTTING AND PATCHING

PART 1 – GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Inspector, Inspections, and Tests, Integration of Work, Nonconforming Work, and Correction of Work, and Uncovering Work;
- B. Special Conditions;
- C. Imported Materials Certification.

1.02 CUTTING AND PATCHING:

- A. Contractor shall be responsible for all cutting, fitting, and patching, including associated excavation and backfill, required to complete the Work or to:
 - (1) Make several parts fit together properly.
 - (2) Uncover portions of Work to provide for installation of ill-timed Work.
 - (3) Remove and replace defective Work.
 - (4) Remove and replace Work not conforming to requirements of Contract Documents.
 - (5) Remove Samples of installed Work as specified for testing.
 - (6) Provide routine penetrations of non-structural surfaces for installation of piping and electrical conduit.
 - (7) Attaching new materials to existing remodeling areas – including painting (or other finishes) to match existing conditions.
- B. In addition to Contract requirements, upon written instructions from the District, Contractor shall uncover Work to provide for observations of covered Work in accordance with the Contract Documents; remove samples of installed materials for testing as directed by District; and remove Work to provide for alteration of existing Work.
- C. Contractor shall not cut or alter Work, or any part of it, in such a way that endangers or compromises the integrity of the Work, the Project, or work of others.

1.03 SUBMITTALS:

- A. Prior to any cutting or alterations that may affect the structural safety of Project, or work of others, and well in advance of executing such cutting or alterations, Contractor shall submit written notice to District pursuant to the applicable notice provisions of the Contract Documents, requesting consent to proceed with the cutting or alteration, including the following:
 - (1) The work of the District or other trades.
 - (2) Structural value or integrity of any element of Project.
 - (3) Integrity or effectiveness of weather-exposed or weather-resistant elements or systems.
 - (4) Efficiency, operational life, maintenance or safety of operational elements.
 - (5) Visual qualities of sight-exposed elements.
- B. Contractor's Request shall also include:
 - (1) Identification of Project.
 - (2) Description of affected Work.
 - (3) Necessity for cutting, alteration, or excavations.
 - (4) Effects of Work on District, other trades, or structural or weatherproof integrity of Project.
 - (5) Description of proposed Work:
 - (a) Scope of cutting, patching, alteration, or excavation.
 - (b) Trades that will execute Work.
 - (c) Products proposed to be used.
 - (d) Extent of refinishing to be done.
 - (6) Alternates to cutting and patching.
 - (7) Cost proposal, when applicable.
 - (8) The scheduled date the Contractor intends to perform the Work and the duration of time to complete the Work.
 - (9) Written permission of District or other District contractor(s) whose work will be affected.

1.04 QUALITY ASSURANCE:

- A. Contractor shall ensure that cutting, fitting, and patching shall achieve security, strength, weather protection, appearance for aesthetic match, efficiency, operational life, maintenance, safety of operational elements, and the continuity of existing fire ratings.
- B. Contractor shall ensure that cutting, fitting, and patching shall successfully duplicate undisturbed adjacent profiles, materials, textures, finishes, colors, and that materials shall match existing construction. Where there is dispute as to whether duplication is successful or has been achieved to a reasonable degree, the District's decision shall be final.

1.05 PAYMENT FOR COSTS:

- A. Cost caused by ill-timed or defective Work or Work not conforming to Contract Documents, including costs for additional services of the District, its consultants, including but not limited to the Construction Manager, the Architect, the Project Inspector(s), Engineers, and Agents, will be paid by Contractor and/or deducted from the Contract by the District.
- B. District shall only pay for cost of Work if it is part of the original Contract Price or if a change has been made to the contract in compliance with the provisions of the General Conditions. Cost of Work performed upon instructions from the District, other than defective or nonconforming Work, will be paid by District on approval of written Change Order. Contractor shall provide written cost proposals prior to proceeding with cutting and patching.

PART 2 - PRODUCTS

2.01 MATERIALS:

- A. Contractor shall provide for replacement and restoration of Work removed. Contractor shall comply with the Contract Documents and with the Industry Standard(s), for the type of Work, and the Specification requirements for each specific product involved. If not specified, Contractor shall first recommend a product of a manufacturer or appropriate trade association for approval by the District.
- B. Materials to be cut and patched include those damaged by the performance of the Work.

PART 3 – EXECUTION

3.01 INSPECTION:

- A. Contractor shall inspect existing conditions of the Site and the Work, including elements subject to movement or damage during cutting and patching, excavating and backfilling. After uncovering Work, Contractor shall inspect conditions affecting installation of new products.

- B. Contractor shall report unsatisfactory or questionable conditions in writing to District as indicated in the General Conditions and shall proceed with Work as indicated in the General Conditions by District.

3.02 PREPARATION:

- A. Contractor shall provide shoring, bracing and supports as required to maintain structural integrity for all portions of the Project, including all requirements of the Project.
- B. Contractor shall provide devices and methods to protect other portions of Project from damage.
- C. Contractor shall, provide all necessary protection from weather and extremes of temperature and humidity for the Project, including without limitation, any work that may be exposed by cutting and patching Work. Contractor shall keep excavations free from water.

3.03 ERECTION, INSTALLATION AND APPLICATION:

- A. With respect to performance, Contractor shall:
 - (1) Execute fitting and adjustment of products to provide finished installation to comply with and match specified tolerances and finishes.
 - (2) Execute cutting and demolition by methods that will prevent damage to other Work, and provide proper surfaces to receive installation of repairs and new Work.
 - (3) Execute cutting, demolition excavating, and backfilling by methods that will prevent damage to other Work and damage from settlement.
- B. Contractor shall employ original installer or fabricator to perform cutting and patching for:
 - (1) Sight-exposed finished surfaces.
- C. Contractor shall execute fitting and adjustment of products to provide a finished installation to comply with specified products, functions, tolerances, and finishes as shown or specified in the Contract Documents including, without limitation, the Drawings and Specifications.
- D. Contractor shall fit Work airtight to pipes, sleeves, conduit, and other penetrations through surfaces. Contractor shall conform to all Code requirements for penetrations or the Drawings and Specifications, whichever calls for a higher quality or more thorough requirement. Contractor shall maintain integrity of both rated and non-rated fire walls, ceilings, floors, etc.
- E. Contractor shall restore Work which has been cut or removed. Contractor shall install new products to provide completed Work in accordance with requirements of the Contract Documents and as required to match surrounding areas and surfaces.

- F. Contractor shall refinish all continuous surfaces to nearest intersection as necessary to match the existing finish to any new finish.

END OF DOCUMENT

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes: Requirements and procedures for ensuring optimal diversion of construction waste materials generated by the Work from landfill disposal within the limits of the Construction Schedule and Contract Sum.
 - 1. The Work of this Contract requires that a minimum of **[65%]** by weight of the construction and demolition materials generated in the Work is diverted from landfill disposal through a combination of re-use and recycling activities.
 - 2. CAL-Green: Alternate waste reduction methods developed in cooperation with local agencies if diversion or recycle facilities capable of compliance with CAL-Green requirements do not exist within the haul boundary of the jobsite (California Code of Regulations, Title 24, Part 11, 5.408).
 - 3. **[LEED projects: Requirements for submittal of LEED documentation in compliance with Materials and Resources Credit 2.1 and Materials and Resources Credit 2.2, Construction Waste Management.]**
 - 4. Requirements for submittal of Contractor's Construction Waste and Recycling Plan prior to the commencement of the Work.
 - 5. Contractor's quantitative reports for construction waste materials as a condition of approval of progress payments submitted to the **[EDIT: Architect or Construction Manager]**

1.2 RELATED REQUIREMENTS

- A. Section 01 3516, Alteration Project Procedures.
- B. Section 01 5000, Temporary Facilities & Controls.
- C. Section 01 7329, Cutting and Patching.
- D. Section 01 8113, Sustainable Design Requirements, for CAL-Green general requirements and procedures.
- E. Section 02 2600, Hazardous Material Abatement (Various Materials).
- F. Section 02 2623, Asbestos Assessment.
- G. Section 02 2626, Lead Assessment.
- H. Section 02 2629, Hazardous Materials Assessment - PCB Ballast & Fluorescent Lamps.
- I. Section 02 4116, Building Demolition.
- J. Section 02 4119, Selective Demolition.
- K. Section 31 1000, Site Clearing.

CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL
SECTION 01 7419
3595001

1.3 REFERENCES AND STANDARDS

- A. California Green Building Standards Code (CALGreen), edition as noted on the drawings, as adopted by the California Division of the State Architect (DSA).

1.4 DEFINITIONS

- A. Class III Landfill: A landfill that accepts non-hazardous resources such as household, commercial, and industrial waste, resulting from construction, remodeling, repair, and demolition operations. A Class III landfill must have a solid waste facilities permit from the California Integrated Waste Management Board (CIWMB) and is regulated by the Enforcement Agency (EA).
- B. Construction and Demolition Debris: Building materials and solid waste resulting from construction, remodeling, repair, cleanup, or demolition operations that are not hazardous as defined in California Code of Regulations, Title 22, Section 66261.3 et seq. This term includes, but is not limited to, asphalt concrete, Portland cement concrete, brick, lumber, gypsum wallboard, cardboard and other associated packaging, roofing material, ceramic tile, carpeting, plastic pipe, and steel. The debris may be commingled with rock, soil, tree stumps, and other vegetative matter resulting from land clearing and landscaping for construction or land development projects.
- C. C&D Recycling Center: A facility that receives only construction and demolition debris material that has been separated for reuse prior to receipt, in which the residual (disposed) amount of waste in the material is less than 10% of the amount separated for reuse by weight.
- D. Disposal: Final deposition of construction and demolition or inert debris into land, including stockpiling onto land of construction and demolition debris that has not been sorted for further processing or resale, if such stockpiling is for a period of time greater than 30 days; and construction and demolition debris that has been sorted for further processing or resale, if such stockpiling is for a period of time greater than one year, or stockpiling onto land of inert debris that is for a period of time greater than one year.
- E. Enforcement Agency (EA): Enforcement agency is the authority having jurisdiction within the Project location.
- F. Inert Disposal Facility or Inert Waste Landfill: A disposal facility that accepts only inert waste such as soil and rock, fully cured asphalt paving, uncontaminated concrete (including fiberglass or steel reinforcing rods embedded in the concrete), brick, glass, and ceramics, for land disposal.
- G. Mixed Debris: Loads that include commingled recyclable and non-recyclable materials generated at the construction site.
- H. Mixed Debris Recycling Facility: A processing facility that accepts loads of commingled construction and demolition debris for the purpose of recovering re-usable and recyclable materials and disposing the non-recyclable residual materials.

CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL
SECTION 01 7419
3595001

- I. Recycling: The process of sorting, cleansing, treating and reconstituting materials for the purpose of using the altered form in the manufacture of a new product. Recycling does not include burning, incinerating or thermally destroying solid waste.
- J. Reuse. The use, in the same or similar form as it was produced, of a material which might otherwise be discarded.
- K. Separated for Reuse. Materials, including commingled recyclables, that have been separated or kept separate from the solid waste stream for the purpose of additional sorting or processing those materials for reuse or recycling in order to return them to the economic mainstream in the form of raw material for new, reused, or reconstituted products which meet the quality standards necessary to be used in the marketplace, and includes materials that have been "source separated".
- L. Solid Waste: All putrescible and nonputrescible solid, semisolid, and liquid wastes, including garbage, trash, refuse, paper, rubbish, ashes, industrial wastes, demolition and construction wastes, abandoned vehicles and parts thereof, discarded home and industrial appliances, dewatered, treated, or chemically fixed sewage sludge which is not hazardous waste, manure, vegetable or animal solid and semisolid wastes, and other discarded solid and semisolid wastes. "Solid waste" does not include hazardous waste, radioactive waste, or medical waste as defined or regulated by State law.
- M. Source-Separated: Materials, including commingled recyclables, that have been separated or kept separate from the solid waste stream at the point of generation, for the purpose of additional sorting or processing of those materials for reuse or recycling in order to return them to the economic mainstream in the form of raw materials for new, reused, or reconstituted products which meet the quality standards necessary to be used in the marketplace.
- N. Waste Hauler: A company that possesses a valid permit from the local waste management authority having jurisdiction to collect and transport solid wastes from individuals or businesses for the purpose of recycling or disposal.

1.5 ADMINISTRATIVE REQUIREMENTS

- A. Submittal Procedures:
 - 1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
 - 2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
 - 3. Sustainable Design Submittals shall comply with the additional requirements of Section 01 8113, Sustainable Design Requirements.

1.6 ACTION SUBMITTALS

- A. Contractor's Construction Waste and Recycling Plan:
 - 1. Review Contract Documents and estimate the types and quantities of materials under the Work that are anticipated to be feasible for on-site processing, source separation for re-use or recycling. Indicate the procedures that will be implemented

CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL
SECTION 01 7419
3595001

- in this program to effect jobsite source separation, such as, identifying a convenient location where dumpsters would be located, putting signage to identify materials to be placed in dumpsters, etc.
2. Prior to commencing the Work, submit Contractor's Construction Waste and Recycling Plan. Submit in format provided with this specification section. The Plan must include, but is not limited to the following:
 - a. Contractor's name and project identification information;
 - b. Procedures to be used;
 - c. Materials to be re-used and recycled;
 - d. Estimated quantities of materials;
 - e. Names and locations of re-use and recycling facilities/sites;
 - f. Tonnage calculations that demonstrate that Contractor will re-use and recycle a minimum of **[65%]** by weight of the construction waste materials generated by the Work.
 3. Contractor's Construction Waste and Recycling Plan must be approved by the Architect prior to the start of Work.
 4. Contractor's Construction Waste and Recycling Plan will not otherwise relieve the Contractor of responsibility for adequate and continuing control of pollutants and other environmental protection measures

1.7 INFORMATIONAL SUBMITTALS

- A. Contractor's Reuse, Recycling, and Disposal Report:
 1. Submit Contractor's Reuse, Recycling, and Disposal Report on the form provided with this specification section with each Application & Certificate for Payment. Failure to submit the form and its supporting documentation will render the Application & Certificate for Payment incomplete and delay progress payments. If applicable, include manifests, weight tickets, receipts, and invoices specifically identifying the Project for re-used and recycled materials:
 - a. Reuse of building materials or salvage items on site (i.e. crushed base or red clay brick).
 - b. Salvaging building materials or salvage items at an offsite salvage or reuse center (i.e. lighting, fixtures).
 - c. Recycling source separated materials on site (i.e. crushing asphalt/concrete for base course, or grinding for mulch).
 - d. Recycling source separated material at an offsite recycling center (i.e. scrap metal or green materials).
 - e. Use of material as Alternative Daily Cover (ADC) at landfills.
 - f. Delivery of soils or mixed inerts to an inert landfill for disposal (inert fill).
 - g. Disposal at a landfill or transfer station (where no recycling takes place).
 - h. Other (describe).
 2. Contractor's Reuse, Recycling, and Disposal Report must quantify all materials generated in the Work, disposed in Class III landfills, or diverted from disposal through recycling. Indicate zero (0) if there is no quantity to report for a type of material. As indicated on the form:

CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL
SECTION 01 7419
3595001

- a. Report disposal or recycling either in tons or in cubic yards. If scales are available at disposal or recycling facility, report in tons; otherwise, report in cubic yards. Report in units for salvage items when no tonnage or cubic yard measurement is feasible.
 - b. Indicate locations to which materials are delivered for reuse, salvage, recycling, accepted as daily cover, inert backfill, or disposal in landfills or transfer stations.
 - c. Provide legible copies of weight tickets, receipts, or invoices that specifically identify the project generating the material. Said documents must be from recyclers and/or disposal site operators that can legally accept the materials for the purpose of re-use, recycling, or disposal.
 - 1) Indicate project title, project number, progress payment number, name of the company completing the Contractor's Report and compiling backup documentation, the printed name, signature, and daytime phone number of the person completing the form, the beginning and ending dates of the period covered on the Contractor's Report, and the date that the Contractor's Report is completed.
3. Demonstrate compliance with California Code of Regulations, Title 24, Part 11 California Green Building Standards Code, "CAL-Green" 5.408.2, to the satisfaction of the enforcing agency.
- a. Landfill **[and Incinerator]** Disposal Records: Indicate receipt and acceptance of waste by landfills **[and incinerator]** facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.
 - b. Recycling and Processing Facility Records: Indicate receipt and acceptance of recyclable waste by recycling and processing facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.
- B. **[For LEED Projects only]** LEED Letter Template: Materials and Resources Credit **[2.1]**
[2.2] Construction Waste Management
1. Complete and sign LEED Letter Template in format provided under the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED) program. Prepare Letter Template on company letterhead.
 - a. Certify that the project has completed a waste management plan and diverted construction, demolition, and land clearing waste to uses other than landfill.
 - b. Provide quantities of diverted materials and means of diversion in the table provided in the LEED Letter Template.
 - c. Indicate how and where waste was diverted.
 - d. Indicate quantities of waste diverted in tons or cubic yards.
 - e. Letter Template will calculate: Total quantity of diverted waste, total quantity of waste, and the percentage of waste diverted.
 - f. For projects where 50% of waste is diverted, one LEED credit will be achieved; where 75% is diverted, two LEED credits will be achieved.
 - g. Include name, organization, role in project, provide signature and date complete

CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL
SECTION 01 7419
3595001

PART 2 - PRODUCTS-NOT USED

PART 3 - EXECUTION

3.1 WASTE MANAGEMENT PLAN

- A. Implement procedures for disposal of materials, as specified in Contractor's Construction Waste and Recycling Plan, which are not diverted for re-use, salvage or recycling.
 - 1. Identify materials to be diverted from disposal by efficient usage, recycling, reuse on the project, or salvage for future use or sale.
 - 2. Determine if materials will be sorted on-site or mixed.
 - 3. Identify diversion facilities where material collected will be taken.
 - 4. Specify that quantities of diverted material will be calculated by weight or volume, but not both.

3.2 SALVAGE, RE-USE, RECYCLING AND PROCEDURES

- A. Re-use, Salvage, and Recycling Facilities: As specified in Contractor's Construction Waste and Recycling Plan.
- B. Develop and implement procedures to re-use, salvage, and recycle new construction and excavation materials, based on the Contract Documents, the Contractor's Construction Waste and Recycling Plan, estimated quantities of available materials, and availability of recycling facilities. Procedures may include on-site recycling, source separated recycling, and/or mixed debris recycling efforts.
 - 1. Identify materials that are feasible for salvage, determine requirements for site storage, and transportation of materials to a salvage facility.
 - 2. Source separate new construction, excavation and demolition materials including, but not limited to the following types.
 - a. Asphalt.
 - b. Concrete, concrete block, slump stone (decorative concrete block), and rocks.
 - c. Drywall.
 - d. Green materials (i.e. tree trimmings and land clearing debris).
 - e. Metal (ferrous and non-ferrous).
 - f. Miscellaneous Construction Debris.
 - g. Paper or cardboard.
 - h. Red Clay Brick.
 - i. Reuse or Salvage Materials
 - j. Soils.
 - k. Wire and Cable.
 - l. Wood.
 - m. Other (describe)

CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL
SECTION 01 7419
3595001

3. Miscellaneous Construction Debris: Develop and implement a program to transport loads of mixed (commingled) new construction materials that cannot be feasibly source separated to a mixed materials recycling facility

3.3 DISPOSAL OPERATIONS AND WASTE HAULING

- A. Legally transport and dispose of materials that cannot be delivered to a source separated or mixed recycling facility to a transfer station or disposal facility that can legally accept the materials for the purpose of disposal.
- B. Use a permitted waste hauler or Contractor's trucking services and personnel. To confirm valid permitted status of waste haulers, contact the local solid waste authority having jurisdiction.
- C. Become familiar with the conditions for acceptance of new construction, excavation and demolition materials at recycling facilities, prior to delivering materials.
- D. Deliver to facilities that can legally accept new construction, excavation and demolition materials for purpose of re-use, recycling, composting, or disposal.
- E. Do not burn, bury or otherwise dispose of solid waste on the project job-site.

3.4 RE-USE AND DONATION OPTIONS

- A. Implement a re-use program to the greatest extent feasible. Options may include:
 1. California Materials Exchange (CAL-MAX) Program is sponsored by the California Integrated Waste Management Board. CAL-MAX is a free service provided by the California Integrated Waste Management Board, designed to help businesses find markets for materials that traditionally would be discarded. The premise of the CAL-MAX Program is that material discarded by one business may be a resource for another business. To obtain a current Materials Listings Catalog, call CAL-MAX/California Integrated Waste Management Board at (916) 255-2369 or send a FAX to (916) 255-2200. The CALMAX Catalog is available through the Internet Site at <http://www.ciwmb/ca.gov/calmax>.

3.5 REVENUE

- A. Revenues or other savings obtained from recycled, re-used, or salvaged materials shall accrue to Contractor unless otherwise noted in the Contract Documents

END OF SECTION

p:\sacramento\3595 tracy unified school district\001-000_villalovoz es new shade structures\08 specifications\06 spec\04 final\freiler - shade struct\01 7419_construction waste management and disposal.docx
Last Updated: December 16, 2021

SECTION 01 7419A
CONTRACTOR'S CONSTRUCTION WASTE AND RECYCLING PLAN
(Submit After Award of Contract and Prior to Start of Work)

Project Title:		
Contract or Work Order No.:		
Contractor's Name:		
Street Address:		
City:	State:	Zip:
Phone: ()	Fax: ()	
E-Mail Address:		
Prepared by: (Print Name)		

Date Submitted:		
Project Period:	From:	TO:

Reuse, Recycling or Disposal Processes To Be Used

Describe the types of recycling processes or disposal activities that will be used for material generated in the project. Indicate the type of process or activity by number, types of materials, and estimated quantities that will be recycled or disposed in the sections below:

- 01 - Reuse of building materials or salvage items on site (i.e. crushed base or red clay brick)
- 02 - Salvaging building materials or salvage items at an off site salvage or re-use center (i.e. lighting, fixtures)
- 03 - Recycling source separated materials on site (i.e. crushing asphalt/concrete for reuse or grinding for mulch)
- 04 - Recycling source separated materials at an off site recycling center (i.e. scrap metal or green matls)
- 05 - Recycling commingled loads of C&D matls at an off site mixed debris recycling center or transfer station
- 06 - Recycling material as Alternative Daily Cover at landfills
- 07 - Delivery of soils or mixed inerts to an inert landfill for disposal (inert fill).
- 08 - Disposal at a landfill or transfer station.
- 09 - Other (please describe) _____

Types of Material To Be Generated

Use these codes to indicate the types of material that will be generated on the project

A = Asphalt	C = Concrete	M = Metals	I = Mixed Inert	G = Green Matls
D = Drywall	P/C=Paper/Cardboard	W/C = Wire/Cable	S= Soils (Non Hazardous)	
M/C = Miscellaneous Construction Debris	R = Reuse/Salvage	W = Wood	O = Other (describe)	

Facilities Used: Provide Name of Facility and Location (City)

Total Truck Loads: Provide Number of Trucks Hauled from Site During Reporting Period

Total Quantities: If scales are available at sites, report in tons. If not, quantify by cubic yards. For salvage/reuse items, quantify by estimated weight (or units).

SECTION I - RE-USED/RECYCLED MATERIALS

Include all recycling activities for source separated or mixed material recycling centers where recycling will occur.

Type of Material	Type of Activity	Facility to be Used/Location	Total Truck Loads	Total Quantities		
(ex.) M	04	ABC Metals, Los Angeles	24	Tons	Cubic YD	Other Wt.
a. Total Diversion			0	0	0	0

SECTION 01 7419A
CONTRACTOR'S CONSTRUCTION WASTE AND RECYCLING PLAN
Continued

SECTION II - DISPOSED MATERIALS						
<i>Include all disposal activities for landfills, transfer stations, or inert landfills where no recycling will occur.</i>						
Type of Material	Type of Activity	Facility to be Used/Location	Total Truck Loads	Total Quantities		
				Tons	Cubic YD	Other Wt.
(ex.) D	08	DEF Landfill, Los Angeles	2	35		
b. Total Disposal				0	0	0

SECTION III - TOTAL MATERIALS GENERATED						
<i>This section calculates the total materials to be generated during the project period (Reuse/Recycle + Disposal = Generation)</i>						
				Tons	Cubic YD	Other Wt.
a. Total Reused/Recycled				0	0	0
b. Total Disposed				0	0	0
c. Total Generated				0	0	0

SECTION IV - CONTRACTOR'S LANDFILL DIVERSION RATE CALCULATION						
<i>Add totals from Section I + Section II</i>						
	Tons	Cubic Yards	Other Wt.			
a. Materials Re-Used and Recycled	0					
b. Materials Disposed	0					
c. Total Materials Generated (a. + b. = c.)	0	0	0			
d. Landfill Diversion Rate (Tons Only)*	#DIV/0!					

* Use tons only to calculate recycling percentages: Tons Reused/Recycled/Tons Generated = % Recycled

Contractor's Comments (Provide any additional information pertinent to planned reuse, recycling, or disposal activities):

Notes:

1. Suggested Conversion Factors: From Cubic Yards to Tons (Use when scales are not available)

Asphalt: .61 (ex. 1000 CY Asphalt = 610 tons. Applies to broken chunks of asphalt)

Concrete: .93 (ex. 1000 CY Concrete = 930 tons. Applies to broken chunks of concrete)

Ferrous Metals: .22 (ex. 1000 CY Ferrous Metal = 220 tons)

Non-Ferrous Metals: .10 (ex. 1000 CY Non-Ferrous Metals = 100 tons)

Drywall Scrap: .20

Wood Scrap: .16

SECTION 01 7419B
CONTRACTOR'S REUSE, RECYCLING, AND DISPOSAL REPORT
(Submit With Each Progress Payment)

Project Title:		
Contract or Work Order No.:		
Contractor's Name:		
Street Address:		
City:	State:	Zip:
Phone: ()	Fax: ()	
E-Mail Address:		
Prepared by: (Print Name)		

Date Submitted:		
Period Covered:	From:	To:

Reuse, Recycling or Disposal Processes Used

Describe the types of recycling processes or disposal activities used for material generated in the project. Indicate the type of process or activity by number, types of materials, and quantities that were recycled or disposed in the sections below:

01 - Reuse of building materials or salvage items on site (i.e. crushed base or red clay brick)
 02 - Salvaging building materials or salvage items at an off site salvage or re-use center (i.e. lighting, fixtures)
 03 - Recycling source separated materials on site (i.e. crushing asphalt/concrete for reuse or grinding for mulch)
 04 - Recycling source separated materials at an off site recycling center (i.e. scrap metal or green matls)
 05 - Recycling commingled loads of C&D matls at an off site mixed debris recycling center or transfer station
 06 - Recycling material as Alternative Daily Cover at landfills
 07 - Delivery of soils or mixed inerts to an inert landfill for disposal (inert fill).
 08 - Disposal at a landfill or transfer station.
 09 - Other (please describe) _____

Types of Material Generated

Use these codes to indicate the types of material that were generated on the project

A = Asphalt	C = Concrete	M = Metals	I = Mixed Inert	G = Green Matls
D = Drywall	P/C=Paper/Cardboard	W/C = Wire/Cable	S= Soils (Non Hazardous)	
M/C = Miscellaneous Construction Debris	R = Reuse/Salvage	W = Wood	O = Other (describe)	

Facilities Used: Provide Name of Facility and Location (City)

Total Truck Loads: Provide Number of Trucks Hauled from Site During Reporting Period

Total Quantities: If scales are available at sites, report in tons. If not, quantify by cubic yards. For salvage/reuse items, quantify by estimated weight (or units).

SECTION I - RE-USED/RECYCLED MATERIALS

Include all recycling activities for source separated or mixed material recycling centers where recycling occurred.

Type of Material	Type of Activity	Facilities Used/Location	Total Truck Loads	Total Quantities		
				Tons	Cubic YD	Other Wt.
(ex.) M	04	ABC Metals, Los Angeles	24	355		
a. Total Diversion			0	0	0	0

SECTION 01 7419B
CONTRACTOR'S REUSE, RECYCLING, AND DISPOSAL REPORT
Continued

SECTION II - DISPOSED MATERIALS						
<i>Include all disposal activities for landfills, transfer stations, or inert landfills where no recycling occurred.</i>						
Type of Material	Type of Activity	Facilities Used/Location	Total Truck Loads	Total Quantities		
				Tons	Cubic YD	Other Wt.
(ex.) D	08	DEF Landfill, Los Angeles	2	35		
b. Total Disposal				0	0	0

SECTION III - TOTAL MATERIALS GENERATED						
<i>This section calculates the total materials generated during the project period (Reuse/Recycle + Disposal = Generation)</i>						
				Tons	Cubic YD	Other Wt.
a. Total Reused/Recycled				0	0	0
b. Total Disposed				0	0	0
c. Total Generated				0	0	0

SECTION IV - CONTRACTOR'S LANDFILL DIVERSION RATE CALCULATION						
<i>Add totals from Section I + Section II</i>						
	Tons	Cubic Yards	Other Wt.			
a. Materials Re-Used and Recycled	0					
b. Materials Disposed	0					
c. Total Materials Generated (a. + b. = c.)	0	0	0			
d. Landfill Diversion Rate (Tons Only)*	#DIV/0!					

* Use tons only to calculate recycling percentages: Tons Reused/Recycled/Tons Generated = % Recycled

Contractor's Comments (<i>Provide any additional information pertinent to planned reuse, recycling, or disposal activities</i>):						

Notes:

- Suggested Conversion Factors: From Cubic Yards to Tons (Use when scales are not available)
Asphalt: .61 (ex. 1000 CY Asphalt = 610 tons. Applies to broken chunks of asphalt)
Concrete: .93 (ex. 1000 CY Concrete = 930 tons. Applies to broken chunks of concrete)
Ferrous Metals: .22 (ex. 1000 CY Ferrous Metal = 220 tons)
Non-Ferrous Metals: .10 (ex. 1000 CY Non-Ferrous Metals = 100 tons)
Drywall Scrap: .20
Wood Scrap: .16

ALTERATION PROJECT PROCEDURES

PART 1 – GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Integration of Work, Purchase of Materials and Equipment, Uncovering of Work and Non-conforming Work and Correction of Work and Trenches;
- B. Special Conditions.

PART 2 - PRODUCTS

2.01 PRODUCTS FOR PATCHING AND EXTENDING WORK:

- A. New Materials: As specified in the Contract Documents including, without limitation, in the Specifications, Contractor shall match existing products, conditions, and work for patching and extending work.
- B. Type and Quality of Existing Products: Contractor shall determine by inspection, by testing products where necessary, by referring to existing conditions and to the Work as a standard.

PART 3 - EXECUTION

3.01 EXAMINATION:

- A. Contractor shall verify that demolition is complete and that areas are ready for installation of new Work.
- B. By beginning restoration Work, Contractor acknowledges and accepts the existing conditions.

3.02 PREPARATION:

- A. Contractor shall cut, move, or remove items as necessary for access to alterations and renovation Work. Contractor shall replace and restore these at completion.
- B. Contractor shall remove unsuitable material not as salvage unless otherwise indicated in the Contract Documents. Unsuitable material may include, without limitation, rotted wood, corroded metals, and deteriorated masonry and concrete. Contractor shall replace materials as specified for finished Work.

- C. Contractor shall remove debris and abandoned items from all areas of the Site and from concealed spaces.
- D. Contractor shall prepare surface and remove surface finishes to provide for proper installation of new Work and finishes.

3.03 INSTALLATION:

- A. Contractor shall coordinate Work of all alternations and renovations to expedite completion and to accommodate District occupancy.
- B. Designated Areas and Finishes: Contractor shall complete all installations in all respects, including operational, and electrical work.
- C. Contractor shall remove, cut, and patch Work in a manner to minimize damage and to provide a means of restoring Products and finishes to original or specified condition.
- D. Contractor shall refinish visible existing surfaces to remain to specified condition for each material, with a neat and square or straight transition to adjacent finishes.
- E. Contractor shall install products as specified in the Contract Documents, including without limitation, the Specifications.

3.04 TRANSITIONS:

- A. Where new Work abuts or aligns with existing, Contractor shall perform a smooth and even transition. Patched Work must match existing adjacent work in texture and appearance.
- B. When finished surfaces are cut so that a smooth transition with new Work is not possible, Contractor shall terminate existing surface along a straight line at a natural line of division and make a recommendation for resolution to the District and the Architect for review and approval.

3.05 ADJUSTMENTS:

- A. Where a change of plane of 1/4 inch or more occurs, Contractor shall submit a recommendation for providing a smooth transition to the District and the Architect for review and approval.
- B. Contractor shall fit Work at penetrations of surfaces.

3.06 REPAIR OF DAMAGED SURFACES:

- A. Contractor shall patch or replace portions of existing surfaces, which are damaged, lifted, discolored, or showing other imperfections, in the area where the Work is performed.
- B. Contractor shall repair substrate prior to patching finish.

3.07 CULTIVATED AREAS AND OTHER SURFACE IMPROVEMENTS:

- A. Cultivated or planted areas and other surface improvements which are damaged by actions of the Contractor shall be restored by Contractor to their original condition or better, where indicated.
- B. Contractor shall protect and replace, if damaged, all existing guard posts, barricades, and fences.
- C. Contractor shall give special attention to avoid damaging or killing trees, bushes and/or shrubs on the Premises and/or identified in the Contract Documents, including without limitation, the Drawings.

3.08 FINISHES:

- A. Contractor shall finish surfaces as specified in the Contract Documents, including without limitations, the provisions of all Divisions of the Specifications.
- B. Contractor shall finish patches to produce uniform finish and texture over entire area. When finish cannot be matched, Contractor shall refinish entire surface to nearest intersections.

3.09 CLEANING:

- A. Contractor shall continually clean the Site and the Premises as indicated in the Contract Documents, including without limitation, the provisions in the General Conditions and the Specifications regarding cleaning.

END OF DOCUMENT

CONTRACT CLOSEOUT AND FINAL CLEANING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Completion of Work;
- B. Special Conditions;
- C. Temporary Facilities and Controls.

1.02 CLOSEOUT PROCEDURES

Contractor shall comply with all closeout provisions as indicated in the General Conditions.

1.03 FINAL CLEANING

- A. Contractor shall execute final cleaning prior to final inspection.
- B. Contractor shall clean interior and exterior glass and all surfaces exposed to view; remove temporary labels, tape, stains, and foreign substances, polish transparent and glossy surfaces, wax and polish new vinyl floor surfaces, vacuum carpeted and soft surfaces.
- C. Contractor shall clean equipment and fixtures to a sanitary condition.
- D. Contractor shall replace filters of operating equipment.
- E. Contractor shall clean debris from roofs, gutters, down spouts, and drainage systems.
- F. Contractor shall clean Site, sweep paved areas, and rake clean landscaped surfaces.
- G. Contractor shall remove waste and surplus materials, rubbish, and construction facilities from the Site and surrounding areas.

1.04 ADJUSTING

Contractor shall adjust operating products and equipment to ensure smooth and unhindered operation.

1.05 RECORD DOCUMENTS AND SHOP DRAWINGS

- A. Contractor shall legibly mark each item to record actual construction, including:
 - (1) Measured depths of foundation in relation to finish floor datum.
 - (2) Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permit surface improvements.
 - (3) Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.
 - (4) Field changes of dimension and detail.
 - (5) Details not on original Contract Drawings
 - (6) Changes made by modification(s).
 - (7) References to related Shop Drawings and modifications.
- B. Contractor will provide one set of Record Drawings to District.
- C. Contractor shall submit all required documents to District and/or Architect prior to or with its final Application for Payment.

1.06 INSTRUCTION OF DISTRICT PERSONNEL

- A. Before final inspection, at agreed upon times, Contractor shall instruct District's designated personnel in operation, adjustment, and maintenance of products, equipment, and systems.
- B. For equipment requiring seasonal operation, Contractor shall perform instructions for other seasons within six months or by the change of season.
- C. Contractor shall use operation and maintenance manuals as basis for instruction. Contractor shall review contents of manual with personnel in detail to explain all aspects of operation and maintenance.
- D. Contractor shall prepare and insert additional data in Operation and Maintenance Manual when the need for such data becomes apparent during instruction.
- E. Contractor shall review contents of manual with personnel in detail to explain all aspects of operation and maintenance.

1.07 SPARE PARTS AND MAINTENANCE MATERIALS

- A. Contractor shall provide products, spare parts, maintenance, and extra materials in quantities specified in the Specifications and in Manufacturer's recommendations.

- B. Contractor shall provide District with all required Operation and Maintenance Data at one time. Partial or piecemeal submissions of Operation and Maintenance Data will not be accepted.

PART 2 – PRODUCTS Not Used.

PART 3 – EXECUTION Not Used.

END OF DOCUMENT

OPERATION AND MAINTENANCE DATA

PART 1 – GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Completion of the Work;
- B. Special Conditions.

1.02 QUALITY ASSURANCE:

Contractor shall prepare instructions and data by personnel experienced in maintenance and operation of described products.

1.03 FORMAT:

- A. Contractor shall prepare data in the form of an instructional manual entitled "OPERATIONS AND MAINTENANCE MANUAL & INSTRUCTIONS" ("Manual").
- B. Binders: Contractor shall use commercial quality, 8-1/2 by 11 inch, three-side rings, with durable plastic covers; two inch maximum ring size. When multiple binders are used, Contractor shall correlate data into related consistent groupings.
- C. Cover: Contractor shall identify each binder with typed or printed title "OPERATION AND MAINTENANCE MANUAL & INSTRUCTIONS"; and shall list title of Project and identify subject matter of contents.
- D. Contractor shall arrange content by systems process flow under section numbers and sequence of Table of Contents of the Contract Documents.
- E. Contractor shall provide tabbed fly leaf for each separate product and system, with typed description of product and major component parts of equipment.
- F. Text: The content shall include Manufacturer's printed data, or typewritten data on 24 pound paper.
- G. Drawings: Contractor shall provide with reinforced punched binder tab and shall bind in with text; folding larger drawings to size of text pages.

1.04 CONTENTS, EACH VOLUME:

- A. Table of Contents: Contractor shall provide title of Project; names, addresses, and telephone numbers of the Architect, any engineers, subconsultants, Subcontractor(s), and Contractor with name of responsible parties; and schedule of products and systems, indexed to content of the volume.

- B. For Each Product or System: Contractor shall list names, addresses, and telephone numbers of Subcontractor(s) and suppliers, including local source of supplies and replacement parts.
- C. Product Data: Contractor shall mark each sheet to clearly identify specific products and component parts, and data applicable to installation. Delete inapplicable information.
- D. Drawings: Contractor shall supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams. Contractor shall not use Project Record Documents as maintenance drawings.
- E. Text: Contractor shall include any and all information as required to supplement product data. Contractor shall provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions.
- F. Warranties and Bonds: Contractor shall bind in one copy of each.

1.05 MANUAL FOR MATERIALS AND FINISHES:

- A. Building Products, Applied Materials, and Finishes: Contractor shall include product data, with catalog number, size, composition, and color and texture designations. Contractor shall provide information for re-ordering custom manufactured products.
- B. Instructions for Care and Maintenance: Contractor shall include Manufacturer's recommendations for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.
- C. Moisture Protection and Weather Exposed Products: Contractor shall include product data listing applicable reference standards, chemical composition, and details of installation. Contractor shall provide recommendations for inspections, maintenance, and repair.
- D. Additional Requirements: Contractor shall include all additional requirements as specified in the Specifications.
- E. Contractor shall provide a listing in Table of Contents for design data, with tabbed fly sheet and space for insertion of data.

1.06 MANUAL FOR EQUIPMENT AND SYSTEMS:

- A. Each Item of Equipment and Each System: Contractor shall include description of unit or system, and component parts and identify function, normal operating characteristics, and limiting conditions. Contractor shall include performance curves, with engineering data and tests, and complete nomenclature, and commercial number of replaceable parts.
- B. Panelboard Circuit Directories: Contractor shall provide electrical service characteristics, controls, and communications.

- C. Contractor shall include color coded wiring diagrams as installed.
- D. Operating Procedures: Contractor shall include start-up, break-in, and routine normal operating instructions and sequences. Contractor shall include regulation, control, stopping, shut-down, and emergency instructions. Contractor shall include summer, winter, and any special operating instructions.
- E. Maintenance Requirements: Contractor shall include routine procedures and guide for trouble-shooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.
- F. Contractor shall provide servicing and lubrication schedule, and list of lubricants required.
- G. Contractor shall include manufacturer's printed operation and maintenance instructions.
- H. Contractor shall include sequence of operation by controls manufacturer.
- I. Contractor shall provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.
- J. Contractor shall provide control diagrams by controls manufacturer as installed.
- K. Contractor shall provide Contractor's coordination drawings, with color coded piping diagrams as installed.
- L. Contractor shall provide charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams.
- M. Contractor shall provide list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.
- N. Additional Requirements: Contractor shall include all additional requirements as specified in Specification(s).
- O. Contractor shall provide a listing in Table of Contents for design data, with tabbed fly sheet and space for insertion of data.

1.07 SUBMITTAL:

- A. Contractor shall submit to the District for review two (2) copies of preliminary draft or proposed formats and outlines of the contents of the Manual within thirty (30) days of Contractor's start of Work.
- B. For equipment, or component parts of equipment put into service during construction and to be operated by District, Contractor shall submit draft content for that portion of the Manual within ten (10) days after acceptance of that equipment or component.

- C. Contractor shall submit two (2) copies of a complete Manual in final form prior to final Application for Payment. Copy will be returned with Architect/Engineer comments. Contractor must revise the content of the Manual as required by District prior to District's approval of Contractor's final Application for Payment.
- D. Contractor must submit two (2) copies of revised Manual in final form within ten (10) days after final inspection.

PART 2 – PRODUCTS Not Used.

PART 3 – EXECUTION Not Used.

END OF DOCUMENT

WARRANTIES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Warranty/Guarantee Information;
- B. Special Conditions.

1.02 FORMAT

- A. Binders: Contractor shall use commercial quality, 8-1/2 by 11 inch, three-side rings, with durable plastic covers; two inch maximum ring size.
- B. Cover: Contractor shall identify each binder with typed or printed title "WARRANTIES" and shall list title of Project.
- C. Table of Contents: Contractor shall provide title of Project; name, address, and telephone number of Contractor and equipment supplier; and name of responsible principal. Contractor shall identify each item with the number and title of the specific Specification, document, provision, or section in which the name of the product or work item is specified.
- D. Contractor shall separate each warranty with index tab sheets keyed to the Table of Contents listing, providing full information and using separate typed sheets as necessary. Contractor shall list each applicable and/or responsible Subcontractor(s), supplier(s), and/or manufacturer(s), with name, address, and telephone number of each responsible principal(s).

1.03 PREPARATION:

- A. Contractor shall obtain warranties, executed in duplicate by each applicable and/or responsible subcontractor(s), supplier(s), and manufacturer(s), within ten (10) days after completion of the applicable item or work. Except for items put into use with District's permission, Contractor shall leave date of beginning of time of warranty blank until the date of completion is determined.
- B. Contractor shall verify that documents are in proper form, contain full information, and are notarized, when required.
- C. Contractor shall co-execute submittals when required.
- D. Contractor shall retain warranties until time specified for submittal.

1.04 TIME OF SUBMITTALS:

- A. For equipment or component parts of equipment put into service during construction with District's permission, Contractor shall submit a draft warranty for that equipment or component within ten (10) days after acceptance of that equipment or component.
- B. Contractor shall submit for District approval all warranties and related documents within ten (10) days after date of completion. Contractor must revise the warranties as required by the District prior to District's approval of Contractor's final Application for Payment.
- C. For items of work delayed beyond date of completion, Contractor shall provide an updated submittal within ten (10) days after acceptance, listing the date of acceptance as start of warranty period.

PART 2 - PRODUCTS Not Used.

PART 3 – EXECUTION Not Used.

END OF DOCUMENT

(Letterhead of Contractor)

STANDARD GUARANTEE / WARRANTY

for

Project Name

Contract No.

We hereby warrant that the Work we have provided under the above reference Contract has been completed in accordance with the Drawings, Specifications, and other Contract Documents.

Under the terms of this warranty, we agree to repair or replace any or all of our work, together with any other adjacent work which may be displaced or damaged by so doing, which may prove to be either patently defective in its workmanship or latently defective in its workmanship or materials within the period of 24 months from the date of filing of the Notice of Completion of the above named Project by the Board of Trustees of the School District, and we also agree to repair any and all damages resulting from such defects, without any expense whatsoever to said Board of Trustees, ordinary wear and tear and unusual abuse or neglect excepted.

In the event of our failure to comply with above-mentioned guarantee conditions within ten (10) day after being notified in writing by the Owner, we collectively and separately do hereby authorize the Owner to have said defective work and damages repaired or replaced and made good at our expense and will honor and pay the costs and charges therefore upon demand.

SIGNED (Contractor) _____

(Address)

(Printed Name of Authorized Representative)

Signature

(License Number)

(Date of Signing)

COUNTERSIGNED (Owner) _____

(Printed Name of Authorized Representative)

Signature

Date of Filing or Notice of Completion: _____

(Letterhead of Company)

SUBCONTRACTOR STANDARD GUARANTEE / WARRANTY

We hereby warrant that

which we have provided in _____

Name of Project _____

for

District _____

has been completed in accordance with Specification Section _____ and requirements of the Contract Documents.

Under the terms of this warranty, we agree to repair or replace any or all of our work, together with any other adjacent work which may be displaced or damaged by so doing, which may prove to be either patently defective in its workmanship or latently defective in its workmanship or materials within a period of 24 months from date of filing the Notice of Completion of the above-named Project by the Board of Trustees of the School District without any expense whatsoever to said Board of Trustees, ordinary wear and tear and unusual abuse or neglect excepted.

In the event of our failure to comply with above-mentioned guarantee conditions within ten (10) day after being notified in writing by the Owner, we collectively and separately do hereby authorize the Owner to have said defective work and damages repaired or replaced and made good at our expense and will honor and pay the costs and charges therefore upon demand.

SIGNED (Subcontractor)

(Signature)

(Company Name)

(Address)

(License Number)

(Date of Signing)

COUNTERSIGNED (General Contractor)

(Signature)

(Company Name)

(Address)

(License Number)

(Date of Signing)

(Letterhead of Company)

SPECIAL EXTENDED WRITTEN GUARANTEE / WARRANTY

We hereby warrant that

which we have provided in _____

for	Name of Project
-----	-----------------

District

has been completed in accordance with Specification Section _____ and requirements of the Contract Documents.

Under the terms of this warranty, we agree to repair or replace any or all of our work, together with any other adjacent work which may be displaced or damaged by so doing, which may prove to be either patently defective in its workmanship or latently defective in its workmanship or materials within a period of _____ year(s) from date of filing the Notice of Completion of the above-named Project by the Board of Trustees of the School District without any expense whatsoever to said Board of Trustees, ordinary wear and tear and unusual abuse or neglect excepted. We also agree to repair any and all damages resulting from such defects.

In the event of our failure to comply with above-mentioned conditions within a reasonable time but in no case longer than ten (10) calendar days after being notified in writing by the Owner, we collectively and separately do hereby authorize the Owner to have said defective work and damages repaired or replaced and made good at our expense and will honor and pay the costs and charges therefore upon demand.

SIGNED (Subcontractor)	
------------------------	--

(Name)

(Address)

(License Number) (Date of Signing)

COUNTERSIGNED (General Contractor)

_____ (Name)

(All over)

(License Number) (Date of Signing)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
---	---	---	---	---	---	---	---	---	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	-----

RECORD DOCUMENTS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Documents on Work;
- B. Special Conditions.

PART 2 - RECORD DRAWINGS

2.01 GENERAL:

- A. As indicated in the Contract Documents, the District will provide Contractor with one set of reproducible, full size original Contract Drawings (mylars).
- B. Contractor shall maintain at each Project Site one set of marked-up plans and shall transfer all changes and information to those marked-up plans, as often as required in the Contract Documents, but in no case less than once each month. Contractor shall submit to the Project Inspector one set of reproducible vellums of the Project Record Drawings ("As-Builts") showing all changes incorporated into the Work since the preceding monthly submittal. The As-Builts shall be available at the Project Site. The Contractor shall submit reproducible vellums at the conclusion of the Project following review of the blueline prints.
- C. Label and date each Record Drawing "RECORD DOCUMENT" in legibly printed letters.
- D. All deviations in construction, including but not limited to pipe and conduit locations and deviations caused by without limitation Change Orders, Construction Claim Directives, RFI's, and Addenda, shall be accurately and legibly recorded by Contractor.
- E. Locations and changes shall be done by Contractor in a neat and legible manner and, where applicable, indicated by drawing a "cloud" around the changed or additional information.

2.02 RECORD DRAWING INFORMATION:

- A. Contractor shall record the following information:
 - (1) Locations of Work buried under or outside each building, including, without limitation, all utilities, plumbing and electrical lines, and conduits.

- (2) Actual numbering of each electrical circuit to match panel schedule.
- (3) Locations of significant Work concealed inside each building whose general locations are changed from those shown on the Contract Drawings.
- (4) Locations of all items, not necessarily concealed, which vary from the Contract Documents.
- (5) Installed location of all cathodic protection anodes.
- (6) Deviations from the sizes, locations, and other features of installations shown in the Contract Documents.
- (7) Locations of underground work, points of connection with existing utilities, changes in direction, valves, manholes, catch basins, capped stubouts, invert elevations, etc.
- (8) Sufficient information to locate Work concealed in each building with reasonable ease and accuracy.

In some instances, this information may be recorded by dimension. In other instances, it may be recorded in relation to the spaces in the building near which it was installed.

- B. Contractor shall provide additional drawings as necessary for clarification.
- C. Contractor shall provide reproducible record drawings, made from final Shop Drawings marked "No Exceptions Taken" or "Approved as Noted."
- D. After review and approval of the marked-up specifications by the Project Inspector, Contractor shall provide electronic copies of the drawings (in PDF format) with one file with all of the sheets and one set of individual sheet files at the conclusion of the Project.

PART 3 - RECORD SPECIFICATIONS

3.01 GENERAL:

- A. Contractor shall mark each section legibly to record manufacturer, trade name, catalog number, and supplier of each Product and item of equipment actually installed.
- B. After review and approval of the marked-up specifications by the Project Inspector, Contractor shall provide one electronic copy of the specifications (in PDF format) at the conclusion of the Project.

PART 4 - MAINTENANCE OF RECORD DOCUMENTS

4.01 GENERAL

- A. Contractor shall store Record Documents apart from documents used for construction as follows:

- (1) Provide files and racks for storage of Record Documents.
- (2) Maintain Record Documents in a clean, dry, legible condition and in good order.

B. Contractor shall not use Record Documents for construction purposes.

PART 5 – PRODUCTS Not Used.

END OF DOCUMENT

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes general requirements and procedures for compliance with California Code of Regulations, Title 24, Part 11 California Green Building Standards Code, "CAL-Green".

- 1. Chapter 5- Non-Residential Mandatory Measures.

1.2 RELATED REQUIREMENTS

- A. Pertinent sections specifying erosion control.
- B. Section 01 6116, Volatile Organic Compound (VOC) Restrictions.
- C. Section 01 7419, Construction Waste Management and Disposal.
- D. Section 01 7700, Closeout Procedures.

1.3 DEFINITIONS

- A. CAL-Green Definitions: Certain terms are defined by CAL-Green in Chapter 5 of the code. Words and terms used in this section shall have the meanings shown therein.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Respond to questions and requests from Architect and the jurisdiction having authority regarding CAL-Green credits that are the responsibility of the Contractor, that depend on product selection or product qualities, or that depend on Contractor's procedures. Document responses as informational submittals.

1.5 SUBMITTALS

- A. CAL-GREEN Submittals: Submit CAL-GREEN submittals required by code and in other Specification Sections.
 - 1. CAL-GREEN submittals are in addition to other submittals. If submitted item is identical to that submitted to comply with other requirements, submit duplicate copies as a separate submittal to verify compliance with indicated CAL-GREEN requirements.
 - 2. Acceptable verification submittals are specified in the related sections.

SUSTAINABLE DESIGN REQUIREMENTS
SECTION 01 8113.10
3595001

PART 2 - PRODUCTS

2.1 REQUIREMENTS - GENERAL

- A. Provide products and procedures necessary to confirm CAL-GREEN compliance required in this Section. Although other Sections may specify some CAL-GREEN requirements, the Contractor shall determine additional materials, techniques, means, methods and procedures necessary to comply with CAL-GREEN requirements.

2.2 STORM WATER POLLUTION PREVENTION PLAN

- A. Section 5.106.1: Comply with requirements of this code section, local ordinances, General Conditions, Special Provisions, and related sections specifying erosion control.

2.3 OUTDOOR WATER USE

- A. Section 5.304.3.1: Irrigation Controllers: Comply with requirements of this code section, local ordinances and Section 32 8000.

2.4 CONSTRUCTION WASTE REDUCTION

- A. Section 5.408 Construction Waste Management, Diversion and Recycling: Comply with requirements of this code section, local ordinances and Section 01 7419.

2.5 BUILDING MAINTENANCE AND OPERATION

- A. Section 5.410.2.5. Documentation and Training: Provide Operations Training as required by these code sections and as specified in Section 01 7700 and Systems Manual as specified in Section 01 7700.

2.6 POLLUTANT CONTROL

- A. Section 5.504.3 Indoor Air Quality: Comply with requirements of this code section, local ordinances and Section 01 3543.
 - 1. During storage, rough installation and until final start-up of HVAC equipment, securely cover all ducts and air distribution component openings with plastic, tape, sheet metal or other methods acceptable to enforcing agency to reduce dust or debris collected in the system.
- B. Section 5.504.4 Finish Material Pollutant Control: All Finish materials shall comply with requirements of this code section, local ordinances and Section 01 6116.

PART 3 - EXECUTION

3.1 GENERAL

- A. Comply with Section 01 7419, Construction Waste Management and Disposal.

SUSTAINABLE DESIGN REQUIREMENTS
SECTION 01 8113.10
3595001

- B. Comply with execution requirements of related sections and applicable local codes and ordinances.

END OF SECTION

*p:\sacramento\3595 tracy unified school district\001-000_villalovoz es new shade structures\08 specifications\06 spec\04 final\freiler
- shade struct\01 8113.10_sustainable design requirements (cal-green).docx
Last Updated: April 8, 2019*

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Glass-fiber-reinforced plastic (FRP) wall paneling.
 - 2. Installation accessories.

1.2 RELATED REQUIREMENTS

EDIT THE FOLLOWING CROSS REFERENCES AND ONLY INCLUDE THOSE USED ON THE PROJECT

- A. Section 01 6116, Volatile Organic Compound (VOC) Restrictions; for VOC limits pertaining to adhesives, sealants, fillers, primers, and coatings.
- B. Section 01 8113, Sustainable Design Requirements, for CAL-Green **[and Collaborative for High Performance Schools (CHPS)]** general requirements and procedures.
- C. Section 06 1000, Rough Carpentry.
- D. Section 09 2900, Gypsum Board.
- E. Section 09 6513, Resilient Base and Accessories.

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CAL Green), edition as noted on the drawings, as adopted by the California Division of the State Architect (DSA).
- C. ASTM International (ASTM):
 - 1. E84: Standard Test Method for Surface Burning Characteristics of Building Materials.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Submittal Procedures:
 - 1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
 - 2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
 - 3. Sustainable Design Submittals shall comply with the additional requirement of Section 01 8113, Sustainable Design Requirements.

FIBERGLASS REINFORCED PLASTIC WALL PANELING

SECTION 06 6400

Project Number

1.5 ACTION SUBMITTALS

- A. Shop Drawings: Submit showing all components, panel joint and end conditions, adjacent materials, and including the following.
 - 1. Dimensioned plans and elevations, drawn to scale.
 - 2. Large-scale details identifying components used and indicating method of attachment.
- B. Product Data: Submit list and complete descriptive data of all products proposed for use. Include manufacturer's specifications, published warranty, installation instructions, and maintenance instructions.
- C. Samples: The following samples are required.
 - 1. FRP panels, 8 inches square, manufacturer's full range of colors for Architect's selection.
 - 2. Trim pieces, 6-inch lengths, for each type.

1.6 INFORMATIONAL SUBMITTALS

- A. Sustainable Design:
 - 1. General:
 - a. Submit information necessary to establish and document compliance with the California Green Building Standards Code.
 - b. Sustainable design submittals are in addition to other submittals.
 - 2. The following information shall be provided:
 - a. Adhesives and Sealants: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.
- B. Sample of manufacturer's warranty.

1.7 CLOSEOUT SUBMITTALS

- A. Warranty/Guarantee: Submit executed warranty and Subcontractor's guarantee.

1.8 QUALITY ASSURANCE

- A. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.
- B. Use materials and products of one manufacturer whenever possible.
- C. All materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.
- D. Work shall be done under direction of a capable foreman experienced in installation of finish carpentry work.

- E. Materials and installation shall meet USDA/FSIS requirements.

1.9 DELIVERY, STORAGE AND HANDLING

- A. Deliver undamaged products to job in manufacturer's sealed containers and/or original bundles with tags and labels intact.
- B. Store materials in protected, dry conditions off of ground and in areas so as to not interfere with the progress of the work.
- C. Allow panels to acclimate with ambient conditions of installation area for not less than 48 hours.
- D. Transport, store and handle in strict accord with the manufacturer's written recommendations.

1.10 FIELD CONDITIONS

- A. Products shall be available at project when required for installation so as not to delay job progress. Installer for these products shall cooperate with installers performing work under other Sections involved to effect proper installation.
- B. Make and be responsible for all field dimensions necessary for proper fitting and completion of work. Report discrepancies to Architect before proceeding.

1.11 WARRANTY

- A. Manufacturer: In addition to the Contractor's and Subcontractor's Guarantee, furnish Owner with manufacturer's fully executed written warranty for FRP panels against defects in materials and workmanship for a period of 2 years.

PART 2 - PRODUCTS

2.1 DESIGN AND PERFORMANCE CRITERIA

- A. Sustainable Design:
 - 1. VOC emissions for field-applied adhesives, sealants, and sealant primers must comply with limits specified in Section 01 6116.

2.2 MATERIALS

- A. Glass-Fiber-Reinforced Plastic (FRP) Wall Panels: "FiberLite" FRP by Nudo Products, Inc. as specified, or equal.
 - 1. Size: 48 inches wide x manufacturer's standard lengths selected by Contractor to minimum installation joints including wall height at vertical application.
 - 2. Thickness: 0.090 inch, minimum.

UPGRADE THE FOLLOWING TO CLASS A IN MULTI-PURPOSE AND CORRIDORS.
--

FIBERGLASS REINFORCED PLASTIC WALL PANELING

SECTION 06 6400

Project Number

3. Flame Spread, ASTM E84: Class C **[A]**.
4. Smoke Developed, ASTM E84: Under 450.
5. Water Absorption: Not over 0.16 percent.
6. Texture: Embossed [Smooth].
7. Color: As selected by the Architect from a minimum of 8 standard colors.

NOTE: CLEAR ANODIZED TRIM IS ALSO AVAILABLE, BUT IS CONSIDERED LESS DURABLE AND EASILY DAMAGED BY CHILDREN.

- B. Trim: Matching PVC moldings for corners, end caps, and division bars.

2.3 ADDITIONAL MATERIALS

- A. Sealant: Silicone type, as provided by panel manufacturer. Color to match wall panels.
- B. Adhesives: VOC compliant, high quality, low odor, non-flammable, water and mold resistant, latex-based as recommended or provided by panel manufacturer.
- C. Provide fasteners, cleaner, and other materials as recommended by panel manufacturer and required for a complete installation.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Prior to installation of FRP panels, carefully inspect and verify that the installed work of all other trades is complete to the point where this installation may properly commence.
- B. Verify that specified items may be installed in accordance with the approved design.
- C. In the event of discrepancy, immediately notify the Architect. Do not proceed in discrepant areas until discrepancies have been fully resolved.

3.2 WALL PANELING INSTALLATION

- A. Set panels on top of flooring base. Secure to walls with adhesive in accordance with panel manufacturer's instructions.
- B. Install matching trim at joints, corners, and other exposed edges.
- C. Install panels vertically, cut to required height, without horizontal joints. Where used as a wainscot 48-inches or less in height, install horizontally without vertical joints except where wall length exceeds maximum available panel length. Joints shall be balanced on each wall with each end panel of equal width or length and not less than one-half full size.
- D. Seal gaps remaining after installation, using silicone sealant.

3.3 CLEANING AND ADJUSTING

- A. Upon completion of installation, remove manufacturer's labels and marks of identification.
- B. Thoroughly wash surfaces and remove foreign material. Leave entire work in neat, orderly, clean and acceptable condition.
- C. Replace damaged parts and surfaces, which are not free from imperfections.

3.4 PROTECTION

- A. Protect work and materials of this Section prior to and during installation and protect the installed work and materials of other trades.
- B. In the event of damage, make all repairs and replacements necessary to the approval of the Architect at no additional cost to the Owner.
- C. Exposed finishes shall be free from scratches, dents, permanent discolorations and other defects in workmanship or material.

END OF SECTION

s:\master specifications\division 06 - wood, plastics, and composites\06 6400_fiberglass reinforced plastic wall paneling.docx
Last Updated: March 23, 2021

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Gypsum board, including finishing.

1.2 RELATED REQUIREMENTS

- A. Section 01 6116, Volatile Organic Compound (VOC) Restrictions; for VOC limits pertaining to adhesives, sealants, fillers, primers, and coatings.
- B. Section 01 8113, Sustainable Design Requirements, for CAL-Green general requirements and procedures.
- C. Section 09 9100, Painting.

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CAL Green), edition as noted on drawings, as adopted by the California Division of the State Architect (DSA).
- C. ASTM International (ASTM):
 - 1. C11: Standard Terminology Relating to Gypsum and related Building Materials and Systems.
 - 2. C473: Standard Test Methods for Physical Testing of Gypsum Panel Products.
 - 3. C475/C475M: Specification for Joint Treatment Materials for Gypsum Wallboard Construction.
 - 4. C557: Specification for Adhesives for Fastening Gypsum Wallboard to Wood Framing.
 - 5. C840: Standard Specification for Application and Finish of Gypsum Board.
 - 6. C1047: Specification for Accessories for Gypsum Wallboard and Gypsum Veneer Base.
 - 7. C1177/C1177M: Specification for Joint Treatment Materials for Gypsum Wallboard Construction.
 - 8. C1396: "Specification for Gypsum Board.
 - 9. C1629/C1629M: Standard Classification for Abuse-Resistant Nondecorated Interior Gypsum Panel Products and Fiber-Reinforced Cement Panels.
 - 10. D3273: Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber.
 - 11. E84: Standard Test Method for Surface Burning Characteristics of Building Materials.

GYPSUM BOARD
SECTION 09 2900
3595001

12. E119: Method for Fire Tests of Building Construction and Materials.

D. Gypsum Association (GA):

1. GA-600: Gypsum Fire Resistance Design Manual.
2. GA-214: Recommended Levels of Finish for Gypsum Board, Glass Mat & Fiber-Reinforced Gypsum Panels.
3. GA-216: Application and Finishing of Gypsum Panel Products.

E. Underwriters Laboratories (UL): Fire Resistance Directory.

1.4 DEFINITIONS

A. Gypsum Board Construction Terminology: Refer to ASTM C11 for definitions of terms for gypsum board construction not defined in this Section or in other referenced standards.

1.5 ADMINISTRATIVE REQUIREMENTS

A. Submittal Procedures:

1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
3. Sustainable Design Submittals shall comply with the additional requirement of Section 01 8113, Sustainable Design Requirements.

B. Coordinate work to avoid delays and interference with work of mechanical, electrical and other trades.

1.6 ACTION SUBMITTALS

A. Product Data: Submit list and complete descriptive data of all products proposed for use. Include manufacturer's specifications, published warranty or guarantee, installation instructions, and maintenance instructions.

B. Samples: Submit sample for each type of finish texture to Architect for review.

1.7 INFORMATIONAL SUBMITTALS

A. Sustainable Design:

1. General:
 - a. Submit information necessary to establish and document compliance with the California Green Building Standards Code.
 - b. Sustainable design submittals are in addition to other submittals.
2. The following information shall be provided:
 - a. Adhesives and Sealants: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.

- b. Paints and Coatings: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.

- B. Statement of installer qualifications, if requested by Architect.

1.8 QUALITY ASSURANCE

- A. Use only new materials and products.
- B. Use materials and products of one manufacturer whenever possible.
- C. Materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.
- D. Workmanship shall be of highest quality. Joints, corners, screws and nail heads shall be finished with long tapered finish, smooth and even in texture. Surfaces shall be prepared to receive paint finish.

1.9 DELIVERY, STORAGE AND HANDLING

- A. Deliver undamaged products to job in manufacturer's sealed containers and/or original bundles with tags and labels intact.
- B. Store materials in protected, dry conditions off of ground and in areas so as to not interfere with the progress of the work.
- C. Transport, store and handle in strict accord with the manufacturer's written recommendations. Materials are to be neatly stacked flat, avoiding undue sag or damaged to board surfaces or edges.

1.10 FIELD CONDITIONS

- A. Do not install wallboard or joint compounds when building temperature is below 55 degrees F or if proper ventilation is not provided to eliminate excessive moisture from building.

PART 2 - PRODUCTS

2.1 DESIGN AND PERFORMANCE CRITERIA

- A. Fire-Resistance-Rated Assemblies: For fire-resistance-rated assemblies, provide materials and install wallboard assembly identical to those tested in assembly indicated according to ASTM E119 by an independent testing agency.
- B. Sustainable Design:
 - 1. VOC emissions for field-applied adhesives, sealants, and sealant primers must comply with limits specified in Section 01 6116.
 - 2. VOC emissions for field-applied paints and coatings must comply with limits specified in Section 01 6116.

GYPSUM BOARD
SECTION 09 2900
3595001

2.2 INTERIOR GYPSUM BOARD PANELS

- A. Gypsum Wallboard: ASTM C1396 Type "X" fire rated with UL label; USG "Sheetrock Firecode," Georgia-Pacific "Fireguard Gypsum Board Type X", National Gypsum "Board Gold Bond Fire-Shield," or equal.
 - 1. Thickness: 5/8 inch unless otherwise shown.
 - 2. Long Edges: Tapered and featured (rounded or beveled) for prefilling.
 - 3. Locations of Use: Walls except as otherwise noted.
- B. Moisture and Mold-Resistant Gypsum Wallboard: ASTM C1396 Type "X" fire rated with UL label; USG "Sheetrock Mold Tough Firecode Core," or equal.
 - 1. Thickness: 5/8 inch unless otherwise shown.
 - 2. Long Edges: Tapered and featured (rounded or beveled) for prefilling.
 - 3. Mold Resistance: 10 on scale of 10 when tested in accordance with ASTM D3273.
 - 4. Moisture Resistance: The average water absorption for panels shall not exceed 5 percent by weight after two-hour immersion when tested in accordance with ASTM C473.
 - 5. Locations of Use:
 - a. Walls at restrooms, where wall will receive FRP finish, and other locations as shown.
 - b. Do not use behind ceramic tile.
 - c. See Section 09 3000, Tiling, for ceramic tile backing.
 - 6. Limitations:
 - a. Avoid exposure to sustained temperatures exceeding 125 degrees F.
 - b. Avoid exposure to excessive, repetitive or continuous moisture before, during and after installation. Eliminate sources of moisture immediately.
 - c. Not suitable for use as a substrate for tile in wet areas such as tubs and showers, gang showers and other areas subject to direct water exposure.

2.3 ACCESSORIES

- A. Fasteners:
 - 1. Screws:
 - a. Gypsum wallboard to wood, use 1-1/4 inch length, bugle head. Second layer of gypsum wallboard to wood use 2 inch length.
 - 2. Other fastener types as required and recommended by gypsum wallboard manufacturer, applicable CBC requirements, and in accordance with the specified standards.
 - 3. Spacing shall be in accordance with the CBC.
- B. Joint System Materials: Conform to ASTM C475.
 - 1. Tape: USG Sheetrock Brand Joint Tape, or equal.
 - 2. Joint compound: USG Sheetrock Brand Joint Compound - Taping, or equal.

3. Joint finishing compound: USG Sheetrock Brand Joint Compound - Topping, or equal.
- C. Sealants:
 1. Interior Wall Sealant: Highly elastic, water-based compound, non-bleeding, non-staining, pumpable and easily applied in beads, and specifically formulated for acoustical sealing; Tremco Acoustical Sealant, Presstite 579.64; or equal.
- D. Adhesives:
 1. Laminating Adhesive: As recommended by gypsum board manufacturer for laminating gypsum board together in fire-rated construction.
 2. Application to Wood Framing: Certified in accordance with ASTM C557.
 3. Adhesives shall comply with required VOC regulations.
- E. Primer/sealer: As specified in Section 09 9100, Painting.
- F. Spray-on Texture Coating: USG "Texture XII Drywall Surfacers," or equal.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Check framing for accurate spacing and alignment. Surfaces shall be checked for surface damage, defects or uneven walls. Uneven walls shall mean those that are not straight, plumb or of even true plane
- B. Verify that spacing of installed framing does not exceed maximum allowable for thickness of gypsum board to be used.
- C. Unacceptable conditions shall be corrected prior to application gypsum board.

3.2 INSTALLATION OF GYPSUM BOARD

- A. General: Comply with ASTM C840, GA-216, and CBC. Where UL designs are indicated on the Drawings for fire-rated partitions, comply with UL requirements, except where exceeded by other requirements.
- B. Board Arrangement Layout: Conform to layouts and requirements indicated; use long boards to restrict joints to minimum. Conditions met and not covered by the Drawings and Specifications shall be resolved in conformity with best practice of trade.
- C. Joints: Butt sheets loosely together with tapered edges always placed together (butt edges placed next to tapered edges are not permitted). Sand or kerf cut edges and mill ends to provide smooth jointing on exposed face. Stagger end joints. Shim wallboard on wood framing to get even joints without offsets.
- D. Fasteners: Place fasteners no less than 3/8 inch from edges of boards. Install fasteners with heads dimpled slightly below surface; do not cut through paper. Use crown face

GYPSUM BOARD
SECTION 09 2900
3595001

hammers for driving nails and approved power tools for self drilling screws. Fasten gypsum wallboard to bearings as follows:

1. Ceilings, Non-rated: Screws 12 inches on center.
 2. Walls, Non-rated: Screws 12 inches on center.
- E. Ceilings: Place boards with long dimension at right angles to supports and end joint occurring over supports. On fire-rated ceilings butted end joints may be placed between supports and reinforced on upper side with 8 inch wide wallboard back up strips set in approved adhesive. Place perimeters of ceilings and edges of openings over solid bearing members.
- F. Cutting and scribing: Cut neatly to fit around outlets, switch boxes and other protrusions, using keyhole saw or specially designed cutting tool for opening of exact shape and size needed.
- G. Trim: Edge exterior corners with specified bead set to true plumb line. Where board joins or abuts a material other than gypsum board, cover end of board with specified metal casing, leaving joint sufficient for installation of sealant. Attach trim with nails at wood studs at 9 inches on center each flange, and type S-12 screws at steel studs at 9 inch on center each flange. No clenching allowed.
- H. Interior Wall Sealant: At interior partitions, use double bead of specified material. Install at floors, wall intersections, where walls abut other materials and at electrical boxes. Apply in accord with manufacturer's printed directions.

3.3 FINISHING

- A. Level of Finishes: In accordance with GA-214.
1. General:
 - a. Finish joints, screw/nail heads or fastener depressions, applied metal trim and surface blemishes, applying tape and compounds in strict accord with manufacturer's printed directions.
 - b. Exposed wallboard shall be finished and sanded as necessary to provide flat, smooth surface ready for decoration and the Finish Levels noted below.
 - c. Primer/sealer, where indicated, is in addition to first coat of primer/sealer in Section 09 9100, Painting.
 2. Level 3 Finish: Provide for finishes with medium to heavy textures. Provide one coat of drywall primer/sealer at prepared surfaces prior to application of final finish.
 3. Level 5 Finish: Provide for gypsum wallboard surfaces with non-textured finishes, and as scheduled on the Drawings, unless otherwise noted.

3.4 ADDITIONAL INSTALLATION REQUIREMENTS

- A. Accessories and Light Fixture Protection: Wherever accessories, panels and recessed light fixtures penetrate fire-rated gypsum wallboard, provide protection box assembly in accordance with UL specifications and as detailed to maintain integrity of rated wall/ceiling system.

- B. Fill voids at wall/floor joints greater than 3/16 inch to provide solid backing for floor base.

3.5 PROTECTION

- A. Protect work and materials of this Section prior to and during installation and protect the installed work and materials of other trades.
- B. In the event of damage, immediately make all repairs and replacements necessary to the approval of the Architect at no additional cost to the Owner.

3.6 CLEAN-UP

- A. Remove all empty containers, scraps of material and all other debris, and leave premises broom clean. Clean all adjoining work spotted or otherwise defaced by this operation.

END OF SECTION

*p:\sacramento\3595 tracy unified school district\001-000_villalovoz es new shade structures\08 specifications\06 spec\04
final\jacobson - shade struct\09 2900_gypsum board.docx
Last Updated: March 26, 2021*

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Ceramic tile.
 - 2. Cementitious backing panels.
 - 3. Setting and grout materials.
 - 4. Waterproof / crack isolation membranes.
 - 5. Miscellaneous materials.

1.2 RELATED REQUIREMENTS

- A. Section 01 6116, Volatile Organic Compound (VOC) Restrictions, for VOC limits pertaining to adhesives, sealants, fillers, primers, and coatings.
- B. Section 01 8113, Sustainable Design Requirements, for CALGreen general requirements and procedures.
- C. Section 08 3113, Access Doors and Frames, for access doors in tiled wall assemblies.

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CALGreen), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- C. 36 CFR 1191 - Americans with Disabilities Act Accessibility Guidelines for Buildings and Facilities; Final Rule; Federal Register, July 26, 1991; updated 2010.
- D. American National Standards Institute (ANSI) / Tile Council of North America (TCNA):
 - 1. A108-A118-A136.1: Tile Industry Specifications.
 - 2. A137.1: Tile Specifications.
- E. ASTM International (ASTM):
 - 1. A153/A153M: Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
 - 2. A666: Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar.

TILING
SECTION 09 3000
3595001

3. A1064/A1064M: Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete.
4. C627: Standard Test Method for Evaluating Ceramic Floor Tile Installation Systems Using the Robinson-Type Floor Tester.
5. C1325: Standard Specification for Fiber-Mat Reinforced Cementitious Backer Units.
6. D4068: Standard Specification for Chlorinated Polyethylene (CPE) Sheeting for Concealed Water-Containment Membrane.
7. E90: Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements.
8. E96/E96M: Standard Test Methods for Gravimetric Determination of Water Vapor Transmission Rate of Materials.
9. E303: Standard Test Method for Measuring Surface Frictional Properties Using the British Pendulum Tester.
10. E413: Classification for Rating Sound Insulation.
11. E492: Standard Test Method for Laboratory Measurement of Impact Sound Transmission Through Floor-Ceiling Assemblies Using the Tapping Machine.
12. E989: Standard Classification for Determination of Single-Number Metrics for Impact Noise.
13. E1007: Standard Test Method for Field Measurement of Tapping Machine Impact Sound Transmission Through Floor-Ceiling Assemblies and Associated Support Structures.
14. E2179: Standard Test Method for Laboratory Measurement of the Effectiveness of Floor Coverings in Reducing Impact Sound Transmission Through Concrete Floors.

F. Tile Council of North America (TCNA):

1. Handbook for Ceramic, Glass and Stone Tile Installation, current edition.

1.4 DEFINITIONS

- A. General: Definitions in the ANSI A108 series of tile installation standards and in ANSI/TCNA A137.1 apply to work of this Section unless otherwise specified.
- B. Module Size: Actual tile size plus joint width indicated.
- C. Face Size: Actual tile size, excluding spacer lugs.
- D. Large Format Tile: Tile that is greater than 15 inches in width or length.
- E. Wet Area: Includes tile surfaces that are either soaked, saturated, or regularly and frequently subjected to moisture such as tub enclosures, showers, swimming pools, commercial kitchens and exterior areas.

1.5 ADMINISTRATIVE REQUIREMENTS

- A. Submittal Procedures:

1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
3. Sustainable Design Submittals shall comply with the additional requirement of Section 01 8113, Sustainable Design Requirements.

1.6 ACTION SUBMITTALS

- A. Product Data:
 1. Manufacturer's product literature for all manufactured products to demonstrate compliance with specified attributes.
 2. Installation instructions for cement backer board, exterior fiber cement board, trim, and accessories.
 3. Installation instructions for manufactured setting and grouting products.
- B. Samples: The following samples are required.
 1. Sample for each type of tile and grout indicated.
 2. Manufacturer's full range of colors for Architect's selection. No additional cost allowance will be permitted for premium colors within manufacturer's full range.
 3. Samples of accessories involving color selection.
 4. Samples of crack isolation membranes, waterproof membranes and backer boards.

1.7 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For installer.
- B. Sample of manufacturer's warranty.
- C. Sustainable Design:
 1. General:
 - a. Submit information necessary to establish and document compliance with the California Green Building Standards Code.
 - b. Sustainable design submittals are in addition to other submittals.
 2. The following information shall be provided:
 - a. Adhesives and Sealants: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.

1.8 CLOSEOUT SUBMITTALS

- A. Warranty/Guarantee: Submit executed warranty and Subcontractor's guarantee.
- B. Specified maintenance materials.

TILING
SECTION 09 3000
3595001

- C. Maintenance Data: For tile, to include in maintenance manuals.

1.9 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials, including tile, trim shapes and grout, which match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Quantity: 3 percent of quantity installed.

1.10 QUALITY ASSURANCE

- A. Installer Qualifications: Use only thoroughly trained and experienced journeyman tile setters completely familiar with the requirements of this work and the recommendations contained in the referenced standards. No allowance will be made for lack of skill on the part of tile setters in acceptance or rejection of installed tile and related products.
- B. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.
- C. Single-Source Responsibility: Use materials and products of one manufacturer whenever possible.
 - 1. Source Limitations for Tile: Obtain tile of each type from one source or producer.
 - a. Obtain tile of each type and color or finish from same production run and of consistent quality in appearance and physical properties for each contiguous area.
 - 2. Source Limitations for Other Products: Obtain each of the following products specified in this Section from a single manufacturer for each product:
 - a. Waterproof membrane.
 - b. Crack isolation membrane.
 - c. Joint sealants.
 - d. Grout.
- D. Materials, components, assemblies, workmanship and installation are to be observed by the Project Inspector. Work not so inspected is subject to uncovering and replacement.

1.11 DELIVERY, STORAGE AND HANDLING

- A. Deliver undamaged products to job in manufacturer's sealed containers and/or original bundles with tags and labels intact.
 - 1. Comply with requirements in ANSI/TCNA A137.1 for labeling tile packages.

- B. Store materials in protected, clean, dry conditions off of ground and in areas so as to not interfere with the progress of the Work. Tile installation materials are to be stored and handled in accordance with ANSI A108.02, Section 2.0.
- C. Transport, store and handle in strict accordance with the manufacturer's written recommendations.

1.12 FIELD CONDITIONS

- A. Environmental conditions for tile installation are to be in accordance with ANSI A108.02, Section 2.2.
- B. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.
- C. Illuminate the work area during installation providing the same level and angle of illumination as will be available for final inspection.

1.13 WARRANTY

- A. Manufacturer: In addition to the Contractor's and Subcontractor's Guarantee, furnish Owner with manufacturer's fully executed written warranty against defects and workmanship for the following:
 - 1. Tile: Manufacturer's available warranty.
 - 2. Assemblies: Single source warranty by setting mortar, grout, and sealant manufacturer for a period of 25 years.
 - 3. Waterproof/crack isolation membrane sheet.
 - a. Lifetime warranty.

PART 2 - PRODUCTS

2.1 DESIGN AND PERFORMANCE CRITERIA

- A. Slip Resistance:
 - 1. For tile installed on walkway surfaces, provide products with the following values as determined by testing identical products per ANSI/TCNA A137.1, Section 9.6.
 - a. Method: Dynamic Coefficient of Friction DCOF AcuTest method, wet test using 0.05 percent sodium lauryl sulfate solution.
 - b. Application: Level interior flooring surface.
 - c. Tested Value: 0.42 or greater.
 - 2. Installed tiles will be subject to field testing to verify slip resistance as specified in Part 3.

TILING
SECTION 09 3000
3595001

- B. Expansion Joints: In accordance with EJ171 of the TCNA Handbook for Ceramic, Glass and Stone Tile Installation. Provide at expansion joints in the backing materials, cold joints in concrete substrate or where backing materials change.
 - 1. Interior Wet Locations: Provide on all surfaces maximum 12 feet on center in both axes.
 - 2. Interior Work, Not Otherwise Specified: Provide on continuous floor areas at intervals of 24 feet.
- C. Sustainable Design:
 - 1. VOC emissions for field-applied adhesives, sealants, and sealant primers must comply with limits specified in Section 01 6116.
 - 2. VOC emissions for field-applied paints and coatings must comply with limits specified in Section 01 6116.

2.2 MATERIALS, GENERAL

- A. ANSI Ceramic Tile Standard: Provide tile that complies with ANSI/TCNA A137.1 for types, compositions, and other characteristics indicated.
 - 1. Provide tile complying with Standard grade requirements unless otherwise indicated.
- B. ANSI Standards for Tile Installation Materials: Provide materials complying with ANSI A108.02, ANSI standards referenced in other Part 2 articles, ANSI standards referenced by TCNA installation methods specified in tile installation schedules, and other requirements specified.
- C. Factory Blending: For tile exhibiting color variations within ranges, blend tile in factory and package so tile units taken from one package show same range in colors as those taken from other packages and match approved Samples.
- D. Mounting: For factory-mounted tile, provide back- or edge-mounted tile assemblies as standard with manufacturer unless otherwise indicated.

2.3 MANUFACTURERS - TILE

- A. Acceptable Manufacturers: Daltile and Crossville, Inc. as specified and the basis of design, American Olean, or equal.

2.4 MATERIALS - TILE

- A. Unglazed Floor Tile: Unglazed, cushion edge, dot type, adhesive mounted in sheets; "Keystones Colorbody Porcelain Mosaics" by Daltile, or equal.
 - 1. Shape and Size: Match existing.
 - 2. Pattern: Match existing.

3. Base: 2 inches x 2 inches mounted, built-up cove base MB-5A of single color.
 4. Colors: Match existing (1 or 2 colors).
 5. Trim Units: Coordinated with sizes and coursing of adjoining flat tile where applicable and matching characteristics of adjoining flat tile. Provide shapes selected from manufacturer's standard shapes.
 6. Grout Color: As selected by Architect from manufacturer's full range.
- B. Glazed Wall Tile: Standard Grade, conforming to Section 6.1 of ANSI/TCNA A137.1; "Color Wheel-Classic, Glazed Ceramic Wall Tile" with cushion edge by Daltile, or equal.
1. Shape and Size: Match existing.
 2. Pattern: Match existing.
 3. Colors:
 - a. Field: Match existing.
 4. Trim Units: Coordinated with sizes and coursing of adjoining flat tile where applicable and matching characteristics of adjoining flat tile. Provide shapes selected from manufacturer's standard shapes.
 5. Grout Color: As selected by Architect from manufacturer's full range.

2.5 MATERIALS – CEMENTITIOUS BACKING PANELS

- A. Cementitious Backer Units (CBU): ANSI A118.9 or ASTM C1325, Type A, in maximum lengths available to minimize end-to-end butt joints; "Durock" by USG, 800-950-3839, or equal.
1. Thickness: 5/8 inch.
- B. Joint Tape: 2-inch wide alkali-resistant glass fiber mesh tape.
- C. Fasteners: Hot dipped galvanized fasteners per ASTM A153/A153M.

2.6 MANUFACTURERS – INSTALLATION MATERIALS

- A. Basis-of-Design Manufacturer: The design is based on "single source" products by MAPEI Corporation, www.mapei.com, as specified.
1. Alternate Manufacturers: Subject to compliance with requirements including "System Warranty", manufacturers offering 'single source' products that may be incorporated into the Work are:
 - a. Laticrete International, Inc., www.laticrete.com
 - b. Ardex Americas, www.ardexamericas.com
 - c. CUSTOM Building Products, www.custombuildingproducts.com.
- B. Source Limitations for Setting Materials, Waterproof/Crack Isolation Liquid Applied Membrane, Grouts and Sealant:

TILING
SECTION 09 3000
3595001

1. Obtain ingredients of uniform quality for each component from a single manufacturer.
- C. Thin-Bed Mortar (Thin-Set): Polymer fortified portland cement mortar complying with ANSI A118.4, ANSI A118.11 and ASTM C627.
1. For wall applications, provide mortar that complies with requirements for non-sagging mortar in addition to the other requirements in ANSI A118.4.
 2. Basis of Design: "Kerabond/Keralastic System" by MAPEI Corporation.
 - a. Thin-Set Mortar gauged with "Keralastic Latex Additive."
 3. Subject to compliance with requirements, provide named product or equivalent product by one of the following:
 - a. Laticrete International, Inc., "254 Platinum."
 - b. "Ardex X 77™ Microtec, Fiber Reinforced Tile and Stone Mortar."
 - c. Custom Building Products, "ProLite Premium Large Format Tile Mortar."
- D. Epoxy Mortar/Adhesive: Thin and medium-bed, chemical resistant epoxy adhesive complying with ANSI A118.3. Use for epoxy mortar applications and water-sensitive stone tile subject to staining, darkening or warping (green, blue, and rose colored marbles, resin-backed and agglomerate).
1. Basis of Design: "Kerapoxy Premium Epoxy Mortar" by MAPEI Corporation.
 2. Subject to compliance with requirements, provide named product or equivalent product by one of the following:
 - a. Laticrete International, Inc., "LATAPOXY 300 Adhesive."
 - b. "Ardex WA, Epoxy Grout and Adhesive."
 - c. Custom Building Products, "EBM-Lite Premium Epoxy Bonding Mortar – 100% Solids."

2.7 GROUT MATERIALS

- A. Polymer-Modified Cement-Based Grout Materials: Zero VOC, water-cleanable grout complying with ANSI A118.7.
1. Basis of Design: "Ultracolor Plus" by MAPEI Corporation
 2. Subject to compliance with requirements, provide named product or equivalent product by one of the following:
 - a. Laticrete International, Inc., "PERMACOLOR Grout."
 - b. "Ardex FL, Rapid Set, Flexible, Sanded Grout."
 - c. Custom Building Products, "Prism Color Consistent Grout."

2.8 CEMENTITIOUS UNDERLAYMENT AND PRIMER

- A. Cementitious Self-Leveling Underlayment: Fast-setting free-flowing cementitious underlayment complying with ASTM C627, consisting of selected

raw materials, portland cement and graded aggregates, mixed with potable water.

1. Basis of Design: "Ultraplan 1 Plus" by MAPEI Corporation.
 2. Subject to compliance with requirements, provide named product or an equivalent product by one of the following:
 - a. Laticrete International, Inc., "Laticrete NXT Level Plus."
 - b. "Ardex TL 1000, Self-Leveling Underlayment."
 - c. "Ardex Liquid BackerBoard, Self-Leveling Underlayment."
 - d. Custom Building Products, "LevelQuik Self-Leveling Underlayment."
- B. Concrete Water-Based Substrate Primer: Surface preparation for self-leveling underlayment to seal porous surfaces and improve underlayment adhesion.
1. Basis of Design: "Primer L" by MAPEI Corporation.
 2. Subject to compliance with requirements, provide named product or an equivalent product by one of the following:
 - a. Laticrete International, Inc., "Laticrete NXT Primer."
 - b. "Ardex P 51 Primer."
 - c. Custom Building Products, "LevelQuik Advance Acrylic Primer."

2.9 WATERPROOF / CRACK ISOLATION MEMBRANE – LIQUID APPLIED

- A. General: Manufacturer's standard zero VOC product complying with ANSI A118.10 and ANSI A118.12 for thin-bed, medium-bed and thick-bed bonded mortar tile applications at walls, floors and ceilings.
- B. Basis of Design: "Mapelastic AquaDefense" by MAPEI Corporation, or equal.
- C. Subject to compliance with requirements, provide named product or an equivalent product by one of the following:
 1. Laticrete International, Inc., "HYDRO BAN."
 2. "Ardex 8+9, Waterproofing and Crack Isolation Compound."
 3. Custom Building Products, "RedGuard Waterproofing and Crack Prevention Membrane."

2.10 SEALANTS

- A. General: Provide manufacturer's standard VOC compliant sealants with characteristics indicated below that comply with applicable requirements in Section 07 9200, Joint Sealants.
 1. Single-component, mildew-resistant, neutral-curing silicone sealant.
 2. Single-component, non-sag urethane sealant.
 3. Acrylic sealants not allowed.

TILING
SECTION 09 3000
3595001

- B. Basis of Design: "Mapesil AC" by MAPEI Corporation.
- C. Subject to compliance with requirements, provide named products or equivalent products by one of the following:
 - 1. Laticrete International, Inc., "LATISIL."
 - 2. "Ardex SX 100% Silicone sealant for Tile and Stone."
 - 3. Custom Building Products, "Commercial 100% Silicone Sealant."
- D. Primer: Provide manufacturer's primer for use with porous stone, submerged and permanent wet areas.
- E. Colors: Provide colors of exposed sealants to match colors of grout in tile adjoining sealed joints unless otherwise indicated.
- F. Refer also to Section 07 9200, Joint Sealants, for installation and preparation requirements.

2.11 MISCELLANEOUS MATERIALS

- A. Metal Edge Strips: L, T and bullnose shapes as shown on Drawings, height to match tile and setting-bed thickness, metallic or combination of metal and PVC or neoprene base, designed specifically for flooring applications; Schluter Systems, Plattsburg, NY, 888-472-4588, or equal.
 - 1. Profiles, materials and finish as indicated. If none are indicated, provide stainless-steel, ASTM A666, Type 302 exposed-edge material.
- B. Patching Compounds: Latex-modified, portland cement-based formulation provided or approved by manufacturer of tile-setting materials for installations indicated.
- C. Tile Protective Coating: Liquid grout-release coating that is formulated to protect exposed surfaces of stone tile and textured tile against adherence of mortar and grout.
 - 1. Compatible with mortar and grout products; easily removable after grouting is completed without damaging grout, stone tile or textured tile; and recommended for use as temporary protective coating for tile product.
 - 2. Floor sealer, complying with floor sealer specified in this Section, may be used provided it is recommended by manufacturer for use as a grout release.
- D. Tile Cleaner: A neutral cleaner capable of removing soil and residue without harming tile and grout surfaces, specifically approved for materials and installations indicated by tile and grout manufacturers.
- E. Grout Sealer (Non Epoxy Grouts): VOC compliant, manufacturer's standard silicone product for sealing grout joints and that does not change color or appearance of grout.

- F. Floor Sealer: VOC compliant, manufacturer's standard product for sealing grout joints and that does not change color or appearance of grout. Colorless, no-sheen, water-based penetrating slip and stain-resistant sealer, not affecting color or physical properties of surfaces as recommended by tile manufacturers.
 - 1. Products: Subject to compliance with requirements, products that may be incorporated into the Work are:
 - a. "Ultracare" line of products manufactured by MAPEI Corporation; www.mapei.com.
 - b. "STONETECH Heavy Duty Grout Sealer Low Solids Coating" manufactured by Laticrete International, Inc.; www.laticrete.com.
 - c. "Aqua Mix Sealer's Choice Gold" manufactured by Custom Building Products; www.custombuildingproducts.com.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas and conditions where tile will be installed, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
 - 1. Verify that substrates for setting tile are firm, dry, clean, and free of coatings that are incompatible with tile-setting materials, including curing compounds and other substances that contain soap, wax, oil, or silicone; and comply with flatness tolerances required by ANSI A108.01 for installations indicated.
 - 2. Verify that concrete substrates for tile floors comply with surface finish requirements in ANSI A108.01 for installations indicated.
 - a. Verify that surfaces that received a steel trowel finish have been mechanically scarified.
 - b. Verify that protrusions, bumps, and ridges have been removed by sanding or grinding.
 - 3. Verify that joints and cracks in tile substrates are coordinated with tile joint locations; if not coordinated, adjust joint locations in consultation with Architect.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Fill cracks, holes, and depressions in concrete substrates for tile floors installed with adhesives or thin-set mortar with trowelable leveling and patching compound specifically recommended by tile-setting material manufacturer.
 - 1. Remove protrusions, bumps, and ridges by sanding or grinding.

TILING
SECTION 09 3000
3595001

2. Correct conditions that do not comply with flatness tolerances specified in referenced ANSI A108 Series of tile installation standards.
- B. Remove coatings that are incompatible with tile-setting materials from substrates, including curing compounds and other substances that contain soap, wax, oil, or silicone.
- C. Where indicated, prepare substrates to receive waterproofing by applying a reinforced mortar bed that complies with ANSI A108.1A and is sloped 1/4 inch per foot (1:50) toward drains.
- D. Blending: For tile exhibiting color variations, verify that tile has been factory blended and packaged so tile units taken from one package show same range of colors as those taken from other packages and match approved samples. If not factory blended, either return to manufacturer or blend tiles at Project site before installing.
- E. Field-Applied Temporary Protective Coating: If indicated under tile type or needed to prevent grout from staining or adhering to exposed tile surfaces, pre-coat them with continuous film of temporary protective coating, taking care not to coat unexposed tile surfaces.

3.3 TILE BACKING PANEL INSTALLATION

- A. Install panels and treat joints according to manufacturer's written instructions for type of application indicated.

3.4 WATERPROOF / CRACK ISOLATION MEMBRANE INSTALLATION

- A. Install waterproof / crack isolation membrane to comply with ANSI A108.13, ANSI A108.17, and manufacturer's written instructions to produce membrane of uniform thickness that is bonded securely, or unbonded, to substrate.

3.5 TILE INSTALLATION

- A. Comply with the TCNA Handbook for Ceramic, Glass, and Stone Tile Installation for TCNA installation methods specified in tile installation schedules. Comply with parts of the ANSI A108 series specifications for installation of tile that are referenced in TCNA installation methods, specified in tile installation schedules, and apply to types of setting and grouting materials used.
- B. For the following installations, follow procedures in the ANSI A108 series of tile installation standards for providing 95 percent mortar coverage:
 1. Tile floors in wet areas.
- C. Wipe backs of tiles with a damp cloth to remove dirt and dust before units are installed.
- D. Pattern Orientation: Match existing.

- E. Extend tile work into recesses and under or behind equipment and fixtures to form complete covering without interruptions unless otherwise indicated. Terminate work neatly at obstructions, edges, and corners without disrupting pattern or joint alignments.
- F. Accurately form intersections and returns. Perform cutting and drilling of tile without marring visible surfaces. Carefully grind cut edges of tile abutting trim, finish, or built-in items for straight aligned joints. Fit tile closely to electrical outlets, piping, fixtures, and other penetrations so plates, collars, or covers overlap tile.
- G. Provide manufacturer's standard trim shapes where necessary to eliminate exposed tile edges.
- H. Where accent tile differs in thickness from field tile, vary setting-bed thickness so that tiles are flush.
- I. Jointing Pattern: Lay tile in grid pattern unless otherwise indicated. Lay out tile work and center tile fields in both directions in each space or on each wall area. Lay out tile work to minimize the use of pieces that are less than half of a tile. Provide uniform joint widths unless otherwise indicated.
 - 1. For tile mounted in sheets, make joints between tile sheets same width as joints within tile sheets so joints between sheets are not apparent in finished work.
 - 2. Where adjoining tiles on floor, base, walls, or trim are specified or indicated to be same size, align joints.
 - 3. Where tiles are specified or indicated to be whole integer multiples of adjoining tiles on floor, base, walls, or trim, align joints unless otherwise indicated.
- J. Joint Widths: Match existing.
- K. Lay out tile wainscots to match existing.
- L. Expansion Joints: Locate expansion joints and other sealant-filled joints, including control, contraction, and isolation joints, where indicated or according to the approved shop drawings, during installation of setting materials, mortar beds, and tile.
 - 1. Install in accordance with TCNA Method EJ171.
 - 2. Do not saw-cut joints after installing tiles.
 - 3. Where joints occur in concrete substrates, locate joints in tile surfaces directly above them.
 - 4. Prepare joints and apply sealants to comply with requirements.
- M. Grout Sealer: Apply grout sealer to cementitious grout joints according to grout-sealer manufacturer's written instructions. As soon as grout sealer has penetrated grout joints, remove excess sealer and sealer from tile faces by wiping with soft cloth.

TILING
SECTION 09 3000
3595001

- N. Floor Sealer: Apply floor sealer to cementitious grout joints in tile floors according to floor-sealer manufacturer's written instructions. As soon as floor sealer has penetrated grout joints, remove excess sealer and sealer from tile faces by wiping with soft cloth.

3.6 GROUT INSTALLATION

- A. Joints shall be packed full and free of all voids or pits, joints shall not be raked. Clean excess grout and mortar from tile surface with water as work progresses. Clean while mortar is fresh and before it hardens on the surface.
- B. Cement Based Grout: Install in accordance with ANSI A108.7 and ANSI A108.10 for cement based grout and the manufacturer's recommended procedures and precautions during application and cleaning.
- C. Epoxy Grout: Install in accordance with ANSI A108.3 and ANSI A108.6 for epoxy grout and the manufacturer's recommended procedures and precautions during application and cleaning.

3.7 INSTALLATION TOLERANCES

- A. Variation from Plumb for Wall Tile: For vertical joints, external corners, and other conspicuous lines, do not exceed 1/8 inch in 10 feet.
- B. Variation in Level for Wall Tile: For horizontal joints and other conspicuous lines, do not exceed 1/4 inch in 20 feet, or 1/2 inch maximum.
- C. Variation in Surface Plane of Floor Tile: Do not exceed 1/8 inch in 10 feet from level or slope indicated when tested with a 10 foot straightedge.
- D. Variation in Plane Between Adjacent Units (Lippage): Do not exceed the following differences between faces of adjacent units as measured from a straightedge parallel to stone tile surface:
 - 1. Units with Polished Faces: 1/64 inch.
 - 2. Units with Honed Faces: 1/32 inch.
 - 3. Units with Sand-Rubbed Faces: 1/32 inch.
 - 4. Units with Thermal-Finished Faces: Depth of thermal finish or 3/16 inch, whichever is less.
 - 5. Units with Natural-Cleft Faces: Depth of natural-cleft finish or 3/16 inch, whichever is less.
- E. Variation in Joint Width: Do not vary joint thickness more than 1/16 inch or one-fourth of nominal joint width, whichever is less.

3.8 DEFECTIVE WORK

- A. Remove and replace tile that is damaged or that does not match adjoining tile. Provide new matching units, installed as specified and in a manner to eliminate evidence of replacement.

3.9 CLEANING AND PROTECTION

- A. Cleaning: On completion of placement and grouting, clean all ceramic tile surfaces so they are free of foreign matter.
 - 1. Use recommended tile protective coating and tile cleaner, as specified.
 - 2. Remove grout residue from tile as soon as possible.
 - 3. Clean grout smears and haze from tile according to tile and grout manufacturer's written instructions but no sooner than 10 days after installation.
 - a. Use only cleaners recommended by tile and grout manufacturers and only after determining that cleaners are safe to use by testing on samples of tile and other surfaces to be cleaned.
 - 4. Protect metal surfaces and plumbing fixtures from effects of cleaning. Flush surfaces with clean water before and after cleaning.
- B. Protect installed tile work with Kraft paper or other heavy covering during construction period to prevent staining, damage, and wear. If recommended by tile manufacturer, apply coat of neutral protective cleaner to completed tile walls and floors.
- C. Prohibit foot and wheel traffic from tiled floors for at least seven days after grouting is completed.
- D. Before final inspection, remove protective coverings and rinse neutral protective cleaner from tile surfaces.

3.10 INTERIOR FLOOR TILE INSTALLATION SCHEDULE

- A. Interior Floor Installations: Standard size tile, slab-on-grade.
 - 1. Tile Installation TCNA F121: ANSI A108.1A, unbonded thick-set reinforced mortar bed (1-1/4 inch minimum to 2-inch maximum thickness) with sheet waterproof / crack isolation /cleavage membrane.
 - a. Tile: ANSI A108.1A, porcelain or ceramic, including quarry.
 - b. Grout: **[ANSI A108.10, cement based] [ANSI A108.6, epoxy]**.

<p>USE ASSEMBLY BELOW FOR ABOVE-GROUND THICK-SET MORTAR INSTALLATIONS NEEDING SOUND REDUCTION MEMBRANE</p>

- B. Interior Floor Installations: Standard size tile, above-ground concrete subfloor.
 - 1. Tile Installation TCNA F112: ANSI A108.1A, bonded thick-set unreinforced mortar bed (3/4 inch minimum to 2-inch maximum thickness) with sheet waterproof / crack isolation / sound reduction membrane.

3.11 FIELD QUALITY CONTROL

- A. Dry or Wet Slip Resistance:

TILING
SECTION 09 3000
3595001

1. Although floor tile has been selected based on manufacturer's data indicating tile meets required slip resistance, installed floor tile shall be field tested using ASTM E303 Standard Test Method for Measuring Surface Frictional Properties Using the British Pendulum Tester.
 - a. Pendulum Test Value (PTV) shall be 45 or greater under dry and wet conditions.
 - b. Individual tests shall be made for each tile flooring product installed.
 - c. Test results shall be reported in writing.
2. Alternative test method, such as use of a BOT-3000E digital tribometer, if proposed, shall provide results for both wet and dry conditions.

3.12 INTERIOR WALL TILE INSTALLATION SCHEDULE

- A. Interior Wall Installations: Standard size tile, non-wet and wet areas except showers.
 1. Tile Installation TCNA W244C: Thin-set mortar **[with liquid-applied waterproof / crack isolation membrane]** on cementitious backer units.
 - a. Wall Type: Wood.
 - b. Backer Board: ANSI A108.11, cement backer board.
 - c. Tile: ANSI A108.5, porcelain or ceramic.
 - d. Grout: **[ANSI A108.10, cement based] [ANSI A108.6, epoxy]**.

3.13 PROTECTION

- A. Protect work and materials of this Section prior to and during installation, and protect the installed work and materials of other trades.
- B. In the event of damage, make all repairs and replacements necessary to the approval of the Architect at no additional cost to the Owner.
- C. Exposed finishes shall be free from scratches, dents, permanent discolorations and other defects in workmanship or material.

END OF SECTION

P:\Sacramento\3595 Tracy Unified School District\001-000_Villalovoz ES New Shade Structures\08 Specifications\06 SPEC\04 FINAL\Jacobson - Shade Struct\09 3000_Tiling.docx
Last Updated: March 15, 2022

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Painting and painter's finish on all exposed exterior and interior surfaces, except prefinished items and unless otherwise noted, as required to complete finishing of the Work. The Work includes, but is not necessarily limited to, the following specific items:
 - 1. Painting work in rooms where finishing work is performed, including painting new surfaces as specified and re-painting existing surfaces within the room, unless otherwise indicated. Re-painting existing surfaces shall be with minimum of one coat using specified coatings compatible with existing.
- B. Items Not Included in This Section:
 - 1. Factory and shop-prefinished items as specified in various Sections.
 - 2. Painting specified elsewhere and included in respective Sections, including but not necessarily limited to shop priming.

1.2 WORK NOT TO BE PAINTED UNLESS OTHERWISE INDICATED

- A. Exposed exterior concrete and concrete slab surfaces, except as noted.
- B. Unfinished masonry, except where noted.
- C. Suspended acoustical ceilings and acoustical tile, except as noted.
- D. Pre-finished casework and other factory and shop-prefinished items as specified in various Sections.
- E. Finish hardware except prime coated items.
- F. Items typically not to be painted including, but not limited to, the following:
 - 1. Glass.
 - 2. Ceramic tile.
 - 3. Resilient floor covering and base.
 - 4. Carpet.
 - 5. Plastic laminate.
 - 6. Porcelain enamel.
 - 7. Vinyl wallcovering, except where noted.
- G. Aluminum doors, windows, frames and railings.
- H. Metal or plastic toilet partitions.
- I. Items of chromium, copper, nickel, brass, bronze or stainless steel.

PAINTING
SECTION 09 9100
3592001

- J. Surfaces in concealed areas such as furred spaces.
- K. Wall areas concealed by cases, counters, cabinets, chalkboards, tackboards (prime coat only required).
- L. Piping or conduit including brackets and similar items therewith running on or across unpainted or otherwise unfinished walls or ceilings.
- M. Galvanized gratings, recessed foot grilles, and thresholds.
- N. Existing rooms or areas not affected by work of this project, unless specifically noted otherwise.

1.3 RELATED REQUIREMENTS

- A. Section 01 6116, Volatile Organic Compound (VOC) Restrictions; for VOC limits pertaining to adhesives, sealants, fillers, primers, and coatings.
- B. Section 01 8113, Sustainable Design Requirements, for CAL-Green general requirements and procedures.
- C. Section 09 2900, Gypsum Board.

1.4 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CAL Green), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- C. ASTM International (ASTM):
 - 1. D523: Standard Test Method for Specular Gloss.
 - 2. D4263: Standard Test Method for Indicating Moisture in Concrete by the Plastic Sheet Method.
 - 3. D6386: Standard Practice for Preparation of Zinc (Hot-Dip Galvanized) Coated Iron and Steel Product and Hardware Surfaces for Painting.
 - 4. D7396: Standard Guide for Preparation of New, Continuous Zinc-Coated (Galvanized) Steel Surfaces for Painting.
- D. Master Painters Institute (MPI):
 - 1. Architectural Painting Manual Guide Specification.
- E. The Association for Materials Protection and Performance (AMPP):
 - 1. SSPC-Society for Protective Coatings/ National Association of Corrosion Engineers International (NACE):
 - a. SSPC-SP 1: Solvent Cleaning.
 - b. SSPC SP-10/NACE No. 2: Near-White Metal Blast Cleaning.

- c. SSPC-SP 16: Brush-Off Blast Cleaning of Coated and Uncoated Galvanized Steel, Stainless Steels, and Non-Ferrous Metals.

1.5 ADMINISTRATIVE REQUIREMENTS

- A. Submittal Procedures:
 - 1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
 - 2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
 - 3. Sustainable Design Submittals shall comply with the additional requirement of Section 01 8113, Sustainable Design Requirements.

1.6 ACTION SUBMITTALS

- A. Product Data: Submit list and complete descriptive data of products proposed for use. Include manufacturer's specifications, published warranty or guarantee, and application instructions. Cross-reference to paint system and locations of application areas.
- B. Samples:
 - 1. Appropriately label and identify each sample, including location and application. Include Architect's number as scheduled on the Drawings, manufacturer's name, color number, and gloss units.
 - 2. Prepare on 8 inch x 10 inch card stock for selected colors and finishes.
 - 3. Submit sufficiently ahead of work progress to allow for color board assembly and distribution.
 - 4. Resubmit as requested until required sheen, color, and texture are approved.

1.7 INFORMATIONAL SUBMITTALS

- A. Statement of applicator qualifications.
- B. Sustainable Design:
 - 1. General:
 - a. Submit information necessary to establish and document compliance with the California Green Building Standards Code.
 - b. Sustainable design submittals are in addition to other submittals.
 - 2. The following information shall be provided:
 - a. Paints and Coatings: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.

1.8 CLOSEOUT SUBMITTALS

- A. Guarantee: Submit Subcontractor's guarantee.

PAINTING
SECTION 09 9100
3592001

1.9 MAINTENANCE MATERIAL SUBMITTALS

- A. At completion of the Work, deliver to Owner extra stock of paint of each color used in each coating material used.
- B. Containers shall be full, tightly sealed, and clearly marked.
- C. Provide the following quantities:
 - 1. Field Colors: 1 five-gallon container.

1.10 QUALITY ASSURANCE

- A. Use only new materials and products.
- B. Single-Source Responsibility:
 - 1. To the maximum extent practicable, select a single manufacturer to provide all materials required by this Section, using additional manufacturers to provide systems not offered by the selected principal manufacturer.
 - 2. For each individual system:
 - a. Provide primer and other undercoat paint produced by same manufacturer as finish coat.
 - b. Use thinner within manufacturer's recommended limits.
- C. Source Quality Control: Material shall be best grade products of type specified and listed below as regularly manufactured by these manufacturers. Materials not bearing manufacturer's identification as standard "best grade product" of their regular line will not be considered for use.
- D. Materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.
- E. Materials and application procedures shall comply with local, state and federal air pollution control regulations.

1.11 DELIVERY, STORAGE AND HANDLING

- A. Deliver undamaged products to job in manufacturer's sealed containers and/or original bundles with tags and labels intact.
- B. Store materials in protected, clean, dry conditions off of ground and in areas which will not interfere with the progress of the Work.
- C. Transport, store and handle in strict accordance with the manufacturer's written recommendations and as specified below.
- D. Remove paint-soiled rags and waste from premises at end of each day's work or store in metal containers with metal covers.

- E. Paint stored at site, shall be in separate structure not less than 60 feet from any other building or structure. Remove empty containers and soiled rags as they accumulate. At completion, remove structure, cleanup area, and leave in original condition.

1.12 FIELD CONDITIONS

- A. Do not apply paints and coatings under conditions which jeopardize quality or appearance of painting or finishing.
- B. Cover or otherwise protect finished work of other trades and surfaces not being painted concurrently or not to be painted.
- C. Interior:
 - 1. Do not apply interior paint when air or surface temperature is below 50 degrees F unless temperature is maintained constantly.
 - 2. Do not apply when ventilation is inadequate to maintain humidity lower than dew point of coldest wall.
- D. Use moisture meter for determining proper moisture levels of surfaces for painting.
- E. Report to Architect in writing upon discovery of any prime coat painting specified in other Sections of Specifications that would prevent proper application of specified finish.
- F. Furnish, erect and remove scaffolding and planks required for work under this Section. Conform to state and local codes, rules and regulations.

1.13 EXISTING CONDITIONS

- A. Existing Surfaces:
 - 1. Paint or otherwise finish all existing surfaces as indicated or scheduled on the Drawings.
 - 2. Work includes primer, paint, repaint or finish of existing painted surfaces altered, defaced or damaged as a result of work under this Contract.
- B. Existing surfaces to be painted include:
 - 1. Work as shown on the Drawings, specified, or as required for a complete Project.

1.14 GUARANTEE

- A. Contractor: Under conditions of its Guarantee under the Contract, paint colors shall be substantially unchanged and finishes shall maintain their original adherence without showing blisters, flaking, peeling, scaling, staining or unusual deterioration or other defects.

PAINTING
SECTION 09 9100
3592001

PART 2 - PRODUCTS

2.1 DESIGN AND PERFORMANCE CRITERIA

- A. Sustainable Design:
 - 1. VOC emissions for field-applied paints and coatings must comply with limits specified in Section 01 6116.

2.2 MANUFACTURERS AND COATING PRODUCTS

- A. Products are specified under "Paint Systems" in Part 3 below and are manufactured by Sherwin-Williams, except as otherwise indicated. Equivalent products to those scheduled manufactured by PPG Architectural Finishes, Glidden Professional, Benjamin Moore & Co., Dunn-Edwards, Vista, or equal, are acceptable.
- B. Materials selected for coating systems for each type surface shall be the product of a single manufacturer or shall be acceptable to manufacturer of finish coating for system.
- C. If more than one quality level of product type is marketed, use material of highest quality.

2.3 MIXING AND TINTING

- A. Deliver paints and stains ready mixed to jobsite. On-site color mixing or tinting will not be allowed.
- B. Each kind of coating for paint finishes shall be factory-mixed to match approved samples, colors, and ready for immediate application.
- C. Mix proprietary products in strict accordance with manufacturer's printed directions.
- D. Thinning, if permitted by manufacturer for a specific coating, shall be in accordance with manufacturer's instructions. Thinning of other products shall be in accordance with standard practice.

2.4 COLORS

- A. Colors shall match existing.
- B. Colors to be selected by the Architect, or where scheduled on the Drawings, are solely for the purpose of conveying color information and do not imply manufacturer's approval or waiver of the requirement that all coatings be from the same manufacturer, unless a specific system is not available from the primary manufacturer.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Prior to the work of this Section, carefully inspect and verify that the installed work of all other trades is complete to the point where this work may properly commence.

- B. Verify that painting may be performed in accordance with the approved design.
- C. In the event of discrepancy, immediately notify Architect. Do not proceed in discrepant areas until discrepancies have been fully resolved.

3.2 PREPARATION

- A. General:
 - 1. Surface preparation and product application shall be in accordance with manufacturer's printed instructions.
 - 2. In addition to prime coats indicated (primer, sealer, filler, undercoat), use two finish coats minimum, and additional coats as required for complete coverage and good appearance of scheduled finish coat.
 - 3. Surfaces to receive new finish shall be properly prepared prior to application of finish coatings.
 - 4. Do not apply paint, enamel, stains or varnishes to wet, damp, dusty, finger-marked, rough, unfinished, or defective surfaces until such defects have been corrected.
- B. Gypsum Board:
 - 1. General:
 - a. Fill narrow, shallow cracks and small holes with spackling compound.
 - 1) Rake deep, wide cracks and deep holes.
 - 2) Dampen with clear water.
 - b. Fill with thin layers of drywall joint cement.
 - c. Allow to dry.
 - d. Sand smooth after drying. Do not raise nap of paper on gypsum board.
- C. Surfaces that cannot be prepared or painted as specified, or to level required by the coating manufacturer, shall be immediately brought to the attention of the Architect, in writing.
 - 1. Starting of work without such notification will be considered acceptance by the Contractor of surfaces involved.
 - 2. Replace unsatisfactory work caused by improper or defective surfaces, as directed by Architect.

3.3 REPAINTING EXISTING INTERIOR SURFACES

- A. Interior surfaces required to be repainted, except acoustic tile, shall be prepared as follows.
 - 1. Wash clean with solution of trisodium phosphate in water and thoroughly rinse or wash with approved self-neutralizing detergent.
 - 2. Spackle, patch, sandpaper, repair, spot or partially prime to provide "hold out" for finish coats of paint and otherwise properly prepare as necessary to provide suitable surfaces, reasonably equal to new, over which to apply specified paints.

PAINTING
SECTION 09 9100
3592001

3.4 CAULKING

- A. Caulk all cracks in finished surfaces.
- B. Seal around any wall openings where original sealant is not fully sealing.
- C. Provide sealant at material transitions and intersections as required.

3.5 PROTECTION

- A. Hardware, fixture canopies, outlet covers, switch plates and other such items shall be removed or loosened and replaced after completing work as required for painting and finishing. Protect items until reinstalled.
- B. Protect work and work of others during progress against damage. Leave such work clean and whole. Correct damage by cleaning, repairing, replacing or repainting as directed.
- C. Provide necessary drop cloths for protection of work. Cover finished surfaces adjacent to work.

3.6 APPLICATION

- A. General:
 - 1. Do not apply initial coating until moisture content of surface is within limitations recommended by paint manufacturer.
 - 2. Apply coatings in accordance with manufacturer's recommendations and the additional requirements, as applicable, of the Architectural Painting Manual Guide Specifications for application methods and paint systems.
 - 3. Flow coat on evenly and well brushed in. Should dead spots occur, touch-up before next coat is applied. Should spots or cracks burn through after final coat is applied, apply additional coats to entire surface as necessary to remedy defects.
 - 4. Rate of application shall be within limits recommended by paint manufacturer for surface involved.
- B. Thicknesses: Rate of application shall be within limits recommended by paint manufacturer for surface involved and comply with the following.
 - 1. Paint materials shall be applied in manner to average 1.5 to 3 Dry Mils in thickness for the total number of coats scheduled.
 - 2. Provide Tooke Dry Mill Coating Inspection Gauge manufactured by Micro Metrics Company to the Project Inspector for inspection of finished coating systems, if requested.
- C. Refinish whole area where portion of finish is not acceptable.
- D. Adjust natural finishes as necessary to obtain identical appearance on veneers and solid stock.

- E. Equipment adjacent to walls shall be disconnected, using workers skilled in appropriate trades, and moved to permit wall surfaces to be painted. Following completion of painting, they shall be expertly replaced and reconnected.
- F. Do not paint over fire-rating labels, fusible links, or sprinkler heads.

3.7 DEFECTIVE WORK

- A. Painter shall be responsible for damage or unsuitable work, including that caused by improperly prepared surfaces. Refinishing shall be at no cost to the Owner. Repair work damaged during construction; touch-up or refinish as necessary any abraded, stained or otherwise damaged surfaces.

3.8 CLEANING AND PROTECTION

- A. Thoroughly clean any drips, splatters, spills, splashes, etc., from walls, floor or other surfaces, with no damage to those surfaces.
- B. Protect work and materials of this Section prior to and during installation, and protect the installed work and materials of other trades.
- C. In the event of damage, make all repairs and replacements necessary to the approval of the Architect at no additional cost to the Owner.

3.9 PAINT SYSTEMS

- A. General:
 - 1. Only major areas are scheduled, but miscellaneous and similar items and areas within room or space shall be treated with suitable system.
 - 2. This Specification shall serve as guide and is meant to establish procedure and quality. Confer with the Architect to determine exact finish desired.
 - 3. Number of coats scheduled is minimum. Additional coats shall be applied at no additional cost as required to hide base material completely, produce uniform color, and provide required and satisfactory finish.
- B. Gloss and Sheen Ratings: Paint gloss shall be defined as the sheen rating of applied paint, in accordance with the following limits in conformance with Master Painters Institute, Inc. (MPI) Standards according to ASTM D523. Not all of the Gloss Levels are necessarily scheduled or used on this Project.

Gloss Level	Description	Units @ 60 degrees	Units @ 85 degrees
G1	Matte or Flat finish	0 to 5	10 max.
G2	Velvet finish	0 to 10	10 to 35
G3	Eggshell finish	10 to 25	10 to 35
G4	Satin finish	20 to 35	35 min.
G5	Semi-Gloss finish	35 to 70	
G6	Gloss finish	70 to 85	

PAINTING
SECTION 09 9100
3592001

Gloss Level	Description	Units @ 60 degrees	Units @ 85 degrees
G7	High-Gloss finish	> 85	

C. Clarification of System Terminology:

1. Interior paint Systems are specified and identified herein by initial letters "INT."
2. Exterior paint Systems are specified and identified herein by initial letters "EXT."
3. The numbers following "INT" and "EXT" for each System identifies the substrate to be coated.
4. Initial numbers for each System identify the substrate to be coated summarized as follows with further clarification included with the System description:

CODE	DESCRIPTION
3.1	Concrete
3.2	Cement Plaster
4	Masonry
5	Metal
6	Wood
9.2	Gypsum Board
9.3	Acoustical Panels and Tile

5. The letter following substrate number identifies the general finish coat chemistry summarized as follows:

CODE	DESCRIPTION
A	Standard acrylic
B	Non-bridging vinyl acrylic
C	Epoxy-like acrylic
D	Semi-transparent stain
E	Elastomeric
F	High performance epoxy-like acrylic
G	Lacquer
H	Aliphatic urethane
I	Fire Retardant Intumescent
J	Acrylic Urethane
K	PVA primer
L	Acrylic primer
M	Premium performance acrylic polymer

6. Hyphenated suffix identifies the topcoat gloss level.

3.10 INTERIOR PAINTING SYSTEMS

INT 9.2A-5

Acrylic on Gypsum Board, smooth finish - Gloss Level 5

1 coat	"ProMar 200" B28W2600	Latex Primer
2 coats	"ProMar 200" B31-2600	Latex Semi-Gloss

Note: Provide additional topcoat at toilet rooms and food service areas.

END OF SECTION

*p:\sacramento\3595 tracy unified school district\001-000_villalovoz es new shade structures\08 specifications\06 spec\04
final\jacobson - shade struct\09 9100_painting.docx
Last Updated: January 26, 2022*

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Code required signage.
 - 2. Exterior building identification and other non-code signage.

1.2 RELATED REQUIREMENTS

- A. Section 01 6116, Volatile Organic Compound (VOC) Restrictions; for VOC limits pertaining to adhesives, sealants, fillers, primers, and coatings.
- B. Section 01 8113, Sustainable Design Requirements, for CAL-Green general requirements and procedures.
- C. Division 26, Electrical.
- D. Signage requirements included on the Drawings.

1.3 REFERENCES AND STANDARDS

- A. California Building Code, edition as noted on the drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CAL Green), edition as noted on drawings, as adopted by the California Division of the State Architect (DSA).
- C. Title 19, CCR, Article 33.01(i).
- D. American National Standards Institute (ANSI):
 - 1. A-117.1: Accessible and Usable Buildings and Facilities.
- E. ASTM International (ASTM):
 - 1. A53/A53M: Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
 - 2. A153/A153M: Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Submittal Procedures:
 - 1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.

SIGNAGE
SECTION 10 1400
3595001

2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
3. Sustainable Design Submittals shall comply with the additional requirement of Section 01 8113, Sustainable Design Requirements.

B. Coordination:

1. Prior to production of shop drawings and samples, coordinate a pre-submittal conference with Architect to confirm submittal requirements, schedule, and sign review process.
2. For signs supported by or anchored to permanent construction, advise installers of anchorage devices about specific requirements for placement of anchorage devices and similar items to be used for attaching signs.

1.5 ACTION SUBMITTALS

A. Shop Drawings:

1. Scaled drawings and signage schedule for each sign indicating materials, lettering layout, and colors.
2. Font Style. 18 point graphical example of alphabet and numerical numbers 0 through 9 of signage font style, upper and lower case letters, punctuation, 18 point scale, and black text on white paper.

B. Product Data: Submit list and complete descriptive data of all products proposed for use. Include manufacturer's specifications, published warranty or guarantee, installation instructions, and maintenance instructions.

C. Samples:

1. Submit three samples of specified signage fonts to be used for visual and tactile characters including braille below the raised characters.
2. Color Verification: Provide physical sample of each available color from the manufacturer. Include color system name and serial number, code and name as applicable.
3. Control Samples. Samples shall be prepared on same base material to be used in fabrication. Submit one sample of each sign type. Signage types are indicated in Construction Document details. Interior signs shall be full size.
4. Dimensional Letters: One full-size representative samples of each dimensional letter type required, showing letter style, color, and material finish and method of attachment.
5. Symbol of Accessibility and Pictograms. Full scale sample of pictograms and symbol of accessibility to be used on sign panels and graphics.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For installer.

B. Sustainable Design:

1. General:
 - a. Submit information necessary to establish and document compliance with the California Green Building Standards Code.
 - b. Sustainable design submittals are in addition to other submittals.
2. The following information shall be provided:
 - a. Adhesives and Sealants: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.
- C. Sample of manufacturer's warranty.
- D. Signage Schedule and Alphanumeric Nomenclature. As a component of shop drawings and informational submittals, verify with Architect the sign nomenclature; room names and numbers; wording of way-finding, directional and informational signage; text; and orientation of wayfinding pictorial graphics.

1.7 CLOSEOUT SUBMITTALS

- A. Warranty/Guarantee: Submit executed warranty and Subcontractor's guarantee.
- B. Maintenance data for signs and sign types including maintenance manuals.

1.8 QUALITY ASSURANCE

- A. Contractor shall assure that the vendor shall be responsible for the quality of materials and workmanship of any firm acting as the vendor's subcontractor.
- B. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.
- C. Use materials and products of one manufacturer whenever possible.
- D. Materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.
- E. The adhesion of inlaid letters and symbols will be tested. See Article WARRANTY.

1.9 DELIVERY, STORAGE AND HANDLING

- A. Deliver undamaged products to job in manufacturer's sealed containers and/or original bundles with tags and labels intact.
- B. Store materials in protected, dry conditions off of ground and in areas so as to not interfere with the progress of the work.
- C. Transport, store and handle in strict accord with the manufacturer's written recommendations.

SIGNAGE
SECTION 10 1400
3595001

1.10 FIELD MEASUREMENTS

- A. Make and be responsible for all field dimensions necessary for proper fitting and completion of work. Report discrepancies to Architect before proceeding.

1.11 WARRANTY

- A. Manufacturer: In addition to the Contractor's and Subcontractor's Guarantee, furnish Owner with manufacturer's available fully executed written warranty for signage against all defects in materials and workmanship, including without limitation against yellowing, cracking, crazing, and other visible and performance defects for a period of 5 years.
 - 1. Text, pictograms or symbols that can be removed from the sign face utilizing a sharp object or other conventional methods will be considered a manufacturing defect.

PART 2 - PRODUCTS

2.1 DESIGN AND PERFORMANCE CRITERIA

- A. Regulatory Standards:
 - 1. Except as otherwise specified or shown, signage shall conform to the following:
 - a. ANSI A-117.1 and the Americans with Disabilities Act (ADA).
 - b. ATBCB Design Guidelines for Signage in relation to the Americans with Disabilities Act.
 - c. California Code of Regulations, Titles 19 and 24.
 - 1) Contracted Grade 2 Braille shall be used whenever Braille symbols are specifically required. Refer to CBC Section 11B-703.3.
 - 2) All signage shall conform to CBC Section 11B-703.
 - d. Uniform Sign Code.
 - 2. When there is a conflict between the CBC and ADA, comply with the most stringent.
- B. Design Criteria: Refer to Chapter 11B of the California Building Code.
 - 1. Raised Characters: Section 11B-703.2.
 - a. Depth: Section 11B-703.2.1.
 - b. Case: Section 11B-703.2.2.
 - c. Style: Section 11B-703.2.3.
 - d. Character Proportions: Section 11B703.2.4.
 - e. Character Height: Section 11B-703.2.5.
 - f. Stroke Thickness: Section 11B-703.2.6.
 - g. Character Spacing: Section 11B-703.2.7.
 - h. Line Spacing: Section 11B-703.2.8.

- i. Installation Height and Location: Section 11B-703.4.
 - 2. Braille: Section 11B-703.3.
 - a. Contracted (Grade 2) Braille with rounded or domed dots shall be used wherever Braille is required.
 - 1) Braille dimensions in accordance with Table 11B-703.3.1.
 - 3. Visual Characters: Section 11B-703.5.
 - a. Character Proportions: Section 11B-703.5.4.
 - b. Stroke Thickness: Section 11B-703.5.7.
 - c. Character Spacing: Section 11B-703.5.8.
 - d. Line Spacing: Section 11B-703.5.9.
 - 4. Pictograms: Section 11B-703.6.
 - a. Pictogram Field: 11B-703.6.1.
 - 1) Characters and Braille shall not be located in the pictogram field.
 - b. Finish and Contrast: Section 11B-703.6.2.
 - 1) Pictograms and their field shall have a non-glare finish. Pictograms shall contrast with their field with either a light pictogram on a dark field or a dark pictogram on a light field.
 - c. Text Descriptors: Section 11B-703.6.3.
 - 1) Locate text descriptors directly below the pictogram field.
 - 2) Text shall be raised characters with braille directly below.
 - 5. International Symbol of Accessibility: Section 11B-703.7.2.1.
 - 6. Toilet Room Door Symbols: Section 11B-703.7.2.6.
 - 7. Tactile Exit Signs: Tactile exit signage to comply with 1013.4 and 11B-703.4.
- C. Sustainable Design:
- 1. VOC emissions for field-applied adhesives, sealants, and sealant primers must comply with limits specified in Section 01 6116.

2.2 PLASTIC SIGNS - TACTILE

- A. Materials, Unless Otherwise Noted:
- 1. Manufacturer and Product: "Inlaid Tactile Sign" by Accent Signage Systems, Inc. Minneapolis, MN, 800-215-9437 as specified and the basis of design; Ellis & Ellis Sign Systems, Sacramento, CA, 916-924-1936; ASI-Modulex, Los Altos, CA, 650-940-1354; Weidner Architectural Signage, Sacramento, CA; or equal.
 - a. Sign Face: Two 1/8-inch plies with eased edges; New Hermes "Gravo-Tac," or equal.
 - 1) Total Thickness: 1/4 inch.
 - 2) Painted signs will not be accepted.
 - b. Tactile Text: Provide tactile text and "Raster" Braille at plastic tactile signage.

SIGNAGE
SECTION 10 1400
3595001

- 1) Tactile text shall be inlaid into sign face 1/32-inch and raised 1/32- inch minimum above sign face surface.
- 2) Inlaid text shall be 1-ply, 1/16-inch thick material; "Gravo-Tac" Exterior or equal.
- 3) Provide text and graphics precisely formed, uniformly opaque to comply with relevant ADA regulations and requirements indicated for size, style, spacing, content, position and colors.
- 4) Symbols where specified shall be International Style.
- 5) Braille shall be Contracted (Grade 2) Braille.
 - a) Dots shall be 0.10-inch on centers in each cell, 0.30-inch on center between corresponding dots in adjacent cells, and 0.395-inch minimum to 0.400-inch maximum on center between corresponding dots in cell directly below.
 - b) Dots shall be raised a minimum of 0.025-inch and a maximum of 0.037-inch above the background, and a base diameter of 0.059-inch minimum and 0.063- inch maximum.
 - c) Dots with straight sides and flat tops are not acceptable.
- c. Colors: High contrast, non-glare, integral colors for graphics.
 - 1) Integral materials shall be U.V. stabilized.
 - 2) Characters, symbols and pictograms shall be in high contrast (light color) with background (dark) color and must conform to the CBC and the ADA Standards.

B. Fabrication:

1. Panel Appearance: Manufacturer's standard, high contrast, semi-matte colors.
2. Surface Texture: Matte Non-glare.
3. Character Style, Size and Layout Position:
 - a. Characters shall be 1-inch high, unless otherwise indicated.
 - b. The stroke of the uppercase letter "I" shall be 15 percent maximum of the height of the character.
 - c. The width of the uppercase letter "O" shall be 60 percent minimum and 110 percent maximum of the height of the uppercase letter "I".
 - d. Character style to be Sans Serif, uppercase, accompanied by Braille directly below text at all locations where raised characters are required.
 - e. Spacing between baselines of separate lines of raised characters with a message shall be 135 percent minimum and 170 percent maximum of the raised character height.
4. Text Schedule: Confirm text, symbols and numbering with the Architect and Owner.
5. Sign Size: As indicated on the Drawings or, if not shown, as reasonably required to accommodate text, symbols and Braille.
 - a. Where signs are installed on window glazing, fabricate a blank sign back to match in size and shape to sign.

- b. Sign backs shall cover back side of sign from view through window on opposite side of sign.
 - c. Signs that are mounted back-to-back on glazing are to be matching in size; the smaller sign is to be increased in size as reasonably required to match the larger sign.
- 6. Sign Shape: As indicated on the Drawings.
 - a. Corners: Radiused, unless otherwise shown.
- 7. Inlaid Letter Adhesion Process: Inlaid material shall be adhered into 1/32-inch deep routed sign face utilizing the heat and pressure bonded/chemically welded process as developed by Accent Signage Systems for the specified "Inlaid Tactile Sign."
 - a. Sign manufacturers for the specified "Inlaid Tactile Sign" shall be familiar with and utilize the exact same manufacturing process developed by Accent Signage Systems.
 - b. Manufacturer must utilize the same and required equipment, products and techniques necessary to produce authentic "Inlaid Tactile Signs" as developed by Accent Signage Systems.
 - c. Other adhesive products and methods, including applied adhesive tapes will not be accepted.
- C. Sign Types: Provide braille translation directly below the raised characters.
 - 1. Room Identification Sign: Provide as shown on the Drawings.
 - a. Provide name and room number at each door indicated.
 - b. Names and numbers to be reviewed and approved by Architect and Owner prior to fabrication.
 - c. Allow an average of 4-numbers and 14-letters for each sign.
 - d. Sign to be provided adjacent to doors as shown.
 - 2. Toilet Room Identification Sign: In addition to the specified Door Symbol, provide a Toilet Room Identification Sign at the strike side of every toilet room door.
 - a. Sign shall include an International Symbol of Accessibility, pictogram, and raised characters, specifying the room name with Braille translation below pictogram.
 - 3. Tactile Exit Sign
 - a. Provide with text in raised characters to read: "EXIT".

2.3 PLASTIC SIGNS - NON-TACTILE

A. Materials, Unless Otherwise Noted:

Manufacturer and Product: Acrylic panel sign as manufactured and distributed by Ellis & Ellis Sign Systems, 916-924-1936, as specified and the basis of design, or equal.

- 1. Sign Face: 1/4-inch, matt finish, non-glare acrylic with subsurface vinyl and paint. Painted faces will not be accepted.
- 2. Colors: Colors shall match specified Tactile Signs and as selected by Architect and Owner.

SIGNAGE
SECTION 10 1400
3595001

- a. Integral materials shall be U.V. stabilized.
- b. Graphics and text shall be in high contrast (light color) with background (dark) color.

B. Fabrication:

- 1. Sign Thickness: 1/4-inch.
- 2. Character Style, Size and Layout Position:
 - a. Characters shall be a minimum of 1-inch high, unless otherwise indicated.
 - b. The stroke thickness of the uppercase letter "I" shall be 10 percent minimum and 20 percent maximum of the height of the character.
 - c. The width of the uppercase letter "O" shall be 60 percent minimum and 110 percent maximum of the height of the uppercase letter "I".
 - d. Letter style to be Sans Serif, uppercase.
 - e. Space characters 10 percent minimum and 35 percent maximum of height of characters, measured between two closest points of adjacent characters, excluding word spaces.
 - f. Spacing between baselines of separate lines of characters within a message shall be 135 percent minimum and 170 percent maximum of character height.
- 3. Text Schedule: Confirm text, symbols and numbering Architect and Owner using the shop drawing/submittal process.
- 4. Sign Size: As indicated on the Drawings or, if not shown, as reasonably required to accommodate text and symbols.
 - a. Where signs are installed on window glazing, fabricate a blank sign back to match in size and shape to sign.
 - b. Sign backs will cover back side of sign from view through window on opposite side of sign.
- 5. Sign Shape: As indicated on the Drawings or, as reasonably required to accommodate the specified text and size at lettering.
 - a. Corners: 1/4-inch radius, unless otherwise shown.

C. Sign Types:

- 1. Toilet Room Door Symbol: Provide one of the following symbols as appropriate to the toilet room type. Toilet Room Door Symbols shall have a color contrast that is distinctly different from the color of the door. Characters, as shown, to be flush with face of symbol. The entire background color must contrast with door. A thin contrasting border around the symbol, with remainder of sign background in a non-contrasting color is not allowed.
 - a. Girls: 12-inch diameter circle, with eased edges.
 - b. Boys: Equilateral triangle with sides 12-inches long, with eased edges.
 - c. Women: 12-inch diameter circle, with eased edges.
 - d. Men: Equilateral triangle with sides 12-inches long, with eased edges.

- e. Unisex or Staff: equilateral triangle of contrasting color and super imposed on and geometrically inscribed within the face of 12-inch diameter circle, which is a contrasting color to the door. The vertices of the triangle symbol shall be located 1/4-inch maximum from the edge of the circle with the vertex pointing upward. Both the circle and triangle to have eased edges.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Prior to installation, carefully inspect and verify that the installed work of other trades is complete to the point where this installation may properly commence.
- B. Verify that specified items may be installed in accordance with the approved design.
- C. In the event of discrepancy, immediately notify Architect. Do not proceed in discrepant areas until discrepancies have been fully resolved.

3.2 INSTALLATION OF SIGNS

- A. General: Locations of signs must be in accordance with the Drawings and approved shop drawings.
- B. Plastic Signs:
 - 1. General:
 - a. Provide both mechanical fasteners and either adhesive or 2-sided adhesive tape as recommended by manufacturer for given mounting substrate.
 - b. Fasteners: Minimum 4-recessed flush head tamper-proof (vandal-resistant) screws per sign.
 - 2. Wood Framed Walls: Mechanical fasteners shall be of adequate length to penetrate exterior finishes and provide secure embedment into wall structure or sheathing.

3.3 PROTECTION

- A. Protect work and materials of this Section and other Sections prior to and during installation, and protect the installed work and materials of all other trades.
- B. In the event of damage, immediately make all repairs and replacements necessary to the approval of the Architect and at no additional cost to the Owner.

SIGNAGE
SECTION 10 1400
3595001

3.4 ADJUSTING AND CLEANING

- A. Remove all dust, dirt, finger marks, etc. from signs and letters using cleaning methods as recommended by manufacturer.

END OF SECTION

*p:\sacramento\3595 tracy unified school district\001-000_villalovoz es new shade structures\08 specifications\06 spec\04 final\freiler
- shade struct\10 1400_ signage.docx
Last Updated: March 30, 2021*

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Toilet accessories.

1.2 RELATED REQUIREMENTS

- A. Section 10 2113, Plastic Toilet Compartments.
- B. Division 26, Electrical.

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the state Architect (DSA).
- B. California Green Building Standards Code (CAL Green), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Submittal Procedures:
 - 1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
 - 2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
- B. Coordination: Coordinate with other trades as required to ensure proper and adequate provision in framing and wall finish for the installation of the selected toilet accessories in the locations required including recessed items)

1.5 ACTION SUBMITTALS

- A. Shop Drawings: Submit showing parts, connections and anchorages, adjacent materials, fully dimensioned and noted.
- B. Product Data: Submit list of each required accessory and complete descriptive data of products proposed for use. Include manufacturer's specifications, published warranty, installation instructions, and maintenance instructions.

1.6 INFORMATIONAL SUBMITTALS

- A. Sample of manufacturer's warranty.

TOILET ACCESSORIES
SECTION 10 2813
3595001

1.7 CLOSEOUT SUBMITTALS

- A. Warranty/Guarantee: Submit executed warranty and Subcontractor's guarantee.
- B. Keys for lockable accessories.
- C. Maintenance data and operating instructions.

1.8 QUALITY ASSURANCE

- A. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.
- B. Use materials and products of one manufacturer whenever possible.
- C. All materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.

1.9 DELIVERY, STORAGE AND HANDLING

- A. Deliver undamaged products to job in manufacturer's sealed containers and/or original bundles with tags and labels intact.
- B. Store materials in protected, dry conditions off of ground and in areas so as to not interfere with the progress of the Work.
- C. Transport, store and handle in strict accord with the manufacturer's written recommendations.

1.10 FIELD CONDITIONS

- A. Make and be responsible for field dimensions necessary for proper fitting and completion of Work. Report discrepancies to Architect before proceeding.
- B. Verify wall depths are adequate for each item prior to ordering. Notify Architect of conflicts or discrepancies.

1.11 WARRANTY

- A. Manufacturer: In addition to the Contractor's and Subcontractor's Guarantee, furnish Owner with manufacturer's fully executed written warranty for toilet accessories against defects in materials and workmanship, agreeing to replace and install toilet accessories at no additional cost to the Owner, within warranty period as follows:
 - 1. For a period of 3 years.

PART 2 - PRODUCTS

2.1 OWNER FURNISHED CONTRACTOR INSTALLED PRODUCTS

- A. The following products will be furnished by the Owner for installation by Contractor. Provide adequate blocking for attachment. Miscellaneous items are to be provided and installed by Contractor.
 - 1. Paper Towel Dispensers.
 - 2. Surface-Mounted Toilet Seat Cover Dispensers.
 - 3. Liquid Soap Dispensers.

2.2 DESIGN AND PERFORMANCE CRITERIA

- A. Conform to applicable requirements of ADA and CBC for accessibility. When in conflict, conform to the most stringent.

2.3 MANUFACTURERS

- A. Accessories: Bobrick Washroom Equipment Inc. or Bradley Corporation as specified and the basis of design, unless otherwise noted, or equal.
 - 1. Manufactured accessories not specified shall require approval as a substitution to be considered equal. Refer to substitution requirements specified in Section 01 3300, Submittal Procedures.
 - 2. Although multiple manufacturers may be specified for a specific accessory, all accessories shall be the product of a single manufacturer, unless otherwise specified or approved.

2.4 MANUFACTURED UNITS

- A. Recessed Toilet Paper Dispenser at Disabled Accessible Locations: Multi-roll; Bobrick B-3888.
- B. Sanitary Napkin/Tampon Dispenser: Coin free operation. Provide semi-recessed unit except where obstruction precludes recessing.
 - 1. Surface-Mounted: Bobrick B-2706C.
- C. Sanitary Napkin Disposal:
 - 1. Surface Mounted for Single Compartment: Bobrick B-270, Bradley 4781-11.
 - 2. Partition Mounted for Two Toilet Compartments: Bobrick B-354, Bradley 4721-15.

2.5 FASTENINGS

- A. Toilet accessories shall be complete with required fastenings.
- B. Fastenings shall either harmonize with the item being fastened, or be of the concealed type.

TOILET ACCESSORIES
SECTION 10 2813
3595001

- C. Exposed fastenings shall be theft and vandal-resistant.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Prior to installation of the Work of this Section, carefully inspect and verify that the installed Work of other trades is complete to the point where this installation may properly commence.
- B. Verify that specified items may be installed in accordance with the approved design.
- C. In the event of discrepancy, immediately notify the Architect. Do not proceed in discrepant areas until discrepancies have been fully resolved.

3.2 PREPARATION

- A. The Contractor shall provide recesses, anchorage and back-up blocking in sizes and in locations as required for proper installation of accessories. Coordinate with other trades where necessary to make provisions for installation.
- B. Securely anchor items in place in locations and at mounting heights indicated. Where specific dimensions are not noted, installation shall be approved by the Architect.
- C. Securely fasten grab bar mounting plates to solid framing or blocking, in accordance with CBC.
- D. Provide cut-outs in toilet partitions for napkin disposal units as required.

3.3 INSTALLATION

- A. Install fixtures, accessories and items in accordance with manufacturers' printed instructions where shown or as approved by Architect.
- B. Mount surface-mounted accessories to solid backing or blocking.
- C. Install plumb and level, securely and rigidly anchored to substrate.
- D. Use concealed vandal-resistant fastenings wherever possible.
 - 1. Adhesive installation not permitted.
 - 2. Provide anchors, bolts and other necessary fasteners, and attach accessories securely to walls or toilet partitions as recommended by manufacturer for each item and each type of substrate condition.
- E. Verify type, location and attachment methods of items furnished by Owner to ensure proper preparation of substrate for solid attachment of accessories.
- F. Sealants: Comply with requirements of Section 07 9200, Joint Sealants.

1. Apply behind toilet accessories as necessary to ensure sanitary and watertight integrity of surfaces.
2. Conceal sealants.

3.4 CLEANING AND ADJUSTING

- A. Upon completion of installation, remove manufacturer's temporary labels, marks of identification.
- B. Thoroughly wash surfaces, remove foreign materials, polish surfaces.
- C. Leave entire accessories in neat, orderly, clean, acceptable condition as approved.
- D. Replace damaged parts, surfaces which are not free from imperfections.

3.5 PROTECTION

- A. Protect Work and materials of this Section prior to and during installation, and protect the installed Work and materials of other trades.
- B. In the event of damage, make repairs and replacements necessary to the approval of the Architect at no additional cost to the Owner.
- C. Exposed finish shall be free from scratches, dents, permanent discolorations and other defects in workmanship or material.

END OF SECTION

p:\sacramento\3595 tracy unified school district\001-000_villalovoz es new shade structures\08 specifications\06 spec\04 final\freiler - shade struct\10 2813_toilet accessories.docx
Last Updated: April 1, 2021

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Engineered fill materials.
 - 2. Imported engineered fill material.
 - 3. Landscape backfill material'
 - 4. Decomposed granite.
 - 5. Aggregate base.

1.2 RELATED REQUIREMENTS

- A. Section 01 5000, Temporary Facilities and Controls.
- B. Section 01 8113, Sustainable Design Requirements, for CAL-Green **[and Collaborative for High Performance Schools (CHPS)]** general requirements and procedures.
- C. Section 31 2333, Trenching and Backfilling.
- D. Section 32 1200, Asphalt Concrete Paving.
- E. Section 32 1600, Site Concrete.
- F. Section 33 0000, Utilities
- G. Section 33 4000, Storm Drainage Utilities.

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CAL Green), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- C. Local Jurisdiction: Any work within the street, highway or right-of-way shall be performed in accordance with the requirement of the governmental agencies having jurisdiction, and shall not begin until all of those governing authorities have been notified.
- D. ASTM International (ASTM):
 - 1. D698-00 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures, Using 5.5 lb (2.49 Kg) Rammer and 12 inch (304.8 mm) Drop.
 - 2. D1556-00 - Test Method for Density of Soil in Place by the Sand-Cone Method.
 - 3. D1557-02e2 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 10 lb. (4.54 Kg) Rammer and 18 inch (457 mm) Drop.

EARTHWORK
SECTION 31 0000
3595001

4. D3017-05 Test Methods for Moisture Content of Soils and Soil-Aggregate Mixture by Nuclear Methods (Shallow Depth).
5. D422-63(2007) e1 Test Method for Particle Size Analysis of Soil.
6. D4318-05 Test Method for Liquid Limit, Plastic Limit, and Plasticity Limit.

E. CALTRANS Standard Specifications Section 17.

F. CAL-OSHA, Title 8, Section 1590 (e).

1.4 ADMINISTRATION REQUIREMENTS

A. Submittal Procedures:

1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
3. Sustainable Design Submittals shall comply with the additional requirements of Section 01 8113, Sustainable Design Requirements.

B. Site Visitation: All bidders interfacing with existing conditions shall visit the site prior to bid to verify general conditions of improvements. Discrepancies must be reported prior to the bid for clarification.

1.5 ACTION SUBMITTALS

A. Provide supplier's descriptive literature for all products to demonstrate compliance with specified attributes.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Contractor / Installer.

1.7 CLOSEOUT SUBMITTALS

A. Guarantee: Submit subcontractor's guarantee.

1.8 QUALITY ASSURANCE

- A. Contractor / Installer shall have been in business for five (5) years providing/finishing similar size projects and complexity.
- B. Contractor shall be solely responsible for all subgrades built. Failures resulting from inadequate compaction or moisture content are the responsibility of the contractor. Contractor shall be solely responsible for any and all repairs.
- C. The representatives of the Owner's testing lab will not act as supervisor of construction, nor will they direct construction operations. Neither the presence of the Owner's testing lab representatives nor the testing by the Owner's testing lab shall excuse the contractors or subcontractors for defects discovered in their work during or following completion of

the project. Correcting of inadequate compaction or moisture content is the sole responsibility of the contractor.

- D. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.
- E. All materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.
- F. Tests (See Part 3, Article "Testing and Observation" for Compaction Testing).

1.9 DELIVERY, STORAGE AND HANDLING

- A. Transport, store and handle in strict accord with the local jurisdiction.

1.10 FIELD CONDITIONS

1.11 EXISTING SITE CONDITIONS

- A. Contractor shall acquaint himself with all site conditions. If unknown active utilities are encountered during work, notify Architect promptly for instructions. Failure to notify will make Contractor liable for damage to these utilities arising from Contractor's operations subsequent to discovery of such unknown active utilities.
- B. Existing civil, mechanical and electrical improvements are shown on respective site plans to the extent known. Should the Contractor encounter any deviation between actual conditions and those shown, he is to immediately notify the Architect before continuing work.

1.12 ON SITE UTILITY VERIFICATION AND REPAIR PROCEDURES

- A. Ground-breaking requirements:
 - 1. All underground work performed by a Contractor must be authorized by the District's Construction Manager or the Low Voltage Consultant prior to start of construction.
 - 2. The Contractor is to obtain and keep the original School's construction utility site plans on site during all excavation operations. Contractor can contact the District's Construction Manager, Facilities Manager, or the Low Voltage Consultant to procure the drawings.
- B. Underground Utility Locating:
 - 1. The contractor shall hire an Underground Utility Locating Service to locate existing underground utility pathways in areas effected by the scope of work for excavation.
 - 2. Contractor must use an underground utility locator service with a minimum of 3 years experience. The equipment operator must have demonstrated experience. Contact Norcal Underground Locating (800/986-6722) or Precision Locating (800/577-7324)

EARTHWORK
SECTION 31 0000
3595001

3. The Underground Utility Locator Service must have the use of equipment with the ability to locate by means of inductive clamping, induction, inductive metal detection, conductive coupling, or TransOnde (Radiodetection) to generate signals, passive locating (free scoping) for "hot" electric, and metal detector.
4. The Underground Utility Locator Service must be able to locate existing utilities at a depth of at least 72".
5. The Underground Utility Locator Service must be able to locate but are not limited to locating the following types of utility pathways:
 - a. All conduit pathways containing 110 volt or greater 50-60Hz electrical wire.
 - b. All conduit pathways containing an active cable TV system.
 - c. All conduit pathways containing wire or conductor in which a signal can be attached and generated without damaging or triggering the existing systems.
 - d. All empty conduit pathways or pipe in which a signal probe or sonde (miniature transmitter) can be inserted.
 - e. All conduit pathways containing non-conductive cables or wires in which a signal probe or sonde (miniature transmitter) can be inserted.
 - f. All plastic and other nonconductive water lines in which a TransOnde Radiodetection) or other "transmitter" can be applied to create a low frequency pressure wave (signal) without damaging or triggering the existing systems.
 - g. All copper or steel waterlines and plastic or steel gas lines.
6. All markings made by the Underground Utility Locator Service or other shall be clear and visible.
7. The contractor shall maintain all markings made by Underground Utility Locator Service or other throughout the entire length of the project.
8. The Underground Utility Locator Service shall provide the contractor with two sets of maps showing the location of utilities and average depth. They will be referenced to permanent buildings. Contractor will deliver one copy to the district at no additional charge.
9. Contractor is responsible to contact Underground Service Alert (U.S.A. 800/227-2600) and receive clearance prior to any excavation operations.
10. Contractor shall inform the (District's Construction Manager)(Architect)(Owner) no later than five (5) days prior to the date scheduled for the utility locator service to be on site.

1.13 PROTECTION

- A. Adequate protection measures shall be provided to protect workmen and passers-by on and off the site. Adjacent property shall be fully protected throughout the operations. Blasting will not be permitted. Prevent damage to adjoining improvements and properties both above and below grade. Restore such improvements to original condition should damage occur. Replace trees and shrubs outside building area disturbed by operations.
- B. In accordance with generally accepted construction practices, the Contractor shall be solely and completely responsible for working conditions at the job site, including safety

of all persons and property during performance of the work. This requirement shall apply continuously and shall not be limited to normal working hours.

- C. Any construction review of the Contractor's performance conducted by the Geotechnical Engineer is not intended to include review of the adequacy of the Contractor's safety measures, in, on, or near the construction site.
- D. Provide shoring, sheeting, sheet piles and or bracing to prevent caving, erosion or gullyng of sides of excavation.
- E. Surface Drainage: Provide for surface drainage during period of construction in manner to avoid creating nuisance to adjacent areas. The contractor shall make a reasonable effort on a daily basis to keep all excavations and the site free from water during entire progress of work, regardless of cause, source, or nature of water.
- F. Adjacent streets and sidewalks shall be kept free of mud, dirt or similar nuisances resulting from earthwork operations.
- G. The site and adjacent influenced areas shall be watered as required to suppress dust nuisance. Dust control measures shall be in accordance with the local jurisdiction.
- H. Trees: Carefully protect existing trees that are to remain. Provide temporary irrigation as necessary to maintain health of trees.

1.14 SEASONAL LIMITS

- A. No fill material shall be placed, spread or rolled during unfavorable weather conditions. When work is interrupted by rains, fill operations shall not be resumed until field tests indicate that moisture content and density of fill are satisfactory.
- B. Excessively wet fill material shall be bladed and aerated per Article "Subgrade Preparation".

1.15 TESTING

- A. General: Refer to Section 01 4523 - TESTING AND INSPECTION SERVICES, AND STRUCTURAL TESTS AND INSPECTIONS LIST, DSA-103.
- B. Geotechnical Engineer: Owner is retaining a Geotechnical Engineer to determine compliance of fill with Specifications, and to direct adjustments in fill operations. Costs of Geotechnical Engineer will be borne by Owner; except those costs incurred for re-tests or re-inspection will be paid by Owner and backcharged to Contractor.
 - 1. If Contractor elects to process or mine onsite materials for use as Suitable Fill, Aggregate Sub Base, Aggregate Base, Rock, Crushed Rock or sand the cost of all testing of this material shall be paid for by the Contractor.
 - 2. Testing of import fill for compliance with Department of Toxic Substance Control (DTSC) shall be paid for by the Contractor.

**EARTHWORK
SECTION 31 0000
3595001**

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Engineered Fill Materials: All fill shall be of approved local materials supplemented by imported fill if necessary. "Approved" local materials are defined as local soils tested and approved by Geotechnical Engineer free from debris, and concentrations of clay and organics; and contain rocks no larger than 3-inches in greatest dimension. The soil and rock should be thoroughly blended so that all rock is surrounded by soil. This may require mixing of the soil and rock with a dozer prior to placement and compaction. Clods, rocks, hard lumps or cobbles exceeding 3-inches in final size shall not be allowed in the upper 6 inches of any fill. Native clay or clayey soils will not be permitted within the upper 12 inches of building pad areas or paved areas.
- B. Imported Engineered Fill Material: Imported fill may be required to complete work. Proposed import fill material shall meet the above requirements; shall be similar to the native soils. Import fill shall meet the above requirements; shall have plasticity index of 20 or less; an Expansion Index of 15 or less; be free of particles greater than 3-inch (3") in largest dimension; be free of contaminants and have corrosion characteristics within the acceptable limits. All import fill material shall be tested and approved by Soils Engineer prior to transportation to the site. Proposed fill material shall comply with DTSC guidelines to include Phase 1 environmental site assessment and related tests. Refer to the October 2001 DTSC Information Advisory for clean imported fill material.
1. DTSC TESTING: Site work contractor is to coordinate testing with an analytical lab, hired by the owner, licensed by the State of California for the DTSC testing. The costs associated with testing will be paid by the contractor.
 2. DTSC testing shall include documentation as to the previous land use, location, and history. Soils shall be analyzed for all compounds of concern to ensure the imported soil is uncontaminated and acceptable. Testing shall be performed per the recommendations included in DTSC Imported Fill Advisory (http://www.dtsc.ca.gov/Schools/upload/SMP_FS_Cleanfill-Schools.pdf). Soils shall be tested prior to import to the project site.
 3. Lab shall determine geographically which tests and analysis comparison will be appropriate for the testing. (CAM 17 / Title 22); (RWQCB) Regional Water Quality Control Board; or (OEHHA) Office of Environmental Health Hazard Assessment.
 4. Frequency of testing shall be conducted in accordance with DTSC's Imported Fill Advisory as follows;

Fill Material Sample Schedule	
Area Of Individual Borrow Area	Sampling Requirements
2 Acres or less	Minimum of 4 samples
2 to 4 Acres	Minimum of 1 sample every ½ acre
4 to 10 Acres	Minimum of 8 samples

**EARTHWORK
SECTION 31 0000
3595001**

Greater than 10 Acres	Minimum of 8 locations with 4 subsamples per location
-----------------------	---

Volume of Borrow Area Stockpile	
Up to 1,000 Cubic Yards	1 sample per 250 cubic yards
1,000 to 5,000 Cubic Yards	4 samples for the first 1000 cubic yards + 1 sample per each additional 500 cubic yards
Greater than 5,000 Cubic Yards	12 samples for the first 5,000 cubic yards + 1 sample per each additional 1,000 cubic yards

5. Reports/ Documentation
 - a. Results of the testing analysis shall be sent to the Owner; Architect; Project Inspector, Project Civil Engineer, DTSC, and DSA. Letter shall reference DSA file and application numbers.
- C. Landscape Backfill Material:
 1. The top 3" of native topsoil stripped from the site may be used for landscape backfill material.
- D. Water: Furnish all required water for construction purposes, including compaction and dust control. Water shall be potable.
- E. Aggregate Base: Provide Class 2 3/4" Aggregate Base conforming to standard gradation as specified in Cal Trans Standard Specifications, Section 26,-1.02A.
- F. Decomposed Granite: Decomposed Granite shall be well graded mixture of fine to 1/8" particles in size with no clods. The material shall be free of vegetation, other soils, debris and rock. The material shall be redish-tan to tan in color.
- G. Decomposed Granite Solidifier: PolyPavement or equal.

PART 3 - EXECUTION

3.1 INSPECTION LAYOUT AND PREPARATION

- A. Prior to installation of the work of this Section, carefully inspect and verify by field measurements that installed work of all other trades is complete to the point were this installation may properly commence
- B. Layout all work, establish grades, locate existing underground utilities, set markers and stakes, setup and maintain barricades and protection facilities; all prior to beginning

**EARTHWORK
SECTION 31 0000
3595001**

actual earthwork operations. Layout and staking shall be done by a licensed Land Surveyor or Professional Civil Engineer.

- C. Verify that specified items may be installed in accordance with the approved design.
- D. In event of discrepancy, immediately notify Owner and the Architect. Do not proceed in discrepant areas until discrepancies have been fully resolved.

3.2 PERFORMANCE

A. GENERAL:

- 1. General: Do all grading, excavating and cutting necessary to conform finish grade and contours as shown. All cuts shall be made to true surface of subgrade.
- 2. Archaeological Artifacts: Should any artifacts of possible historic interest be encountered during earthwork operations, halt all work in area of discovery and immediately contact the Architect for notification of appropriate authorities.
- 3. Degree of Compaction: Percentage of maximum density, hereinafter specified as degree of compaction required, means density equivalent to that percentage of maximum dry density determined by ASTM D1557 Compaction Test method, and such expressed percentage thereof will be minimum acceptable compaction for specified work.
- 4. Moisture Content: Moisture content shall be as noted below and as called for on the plans. Moisture content shall be maintained until subgrade is covered by surfacing materials.

3.3 DEMOLITION, DISPOSAL AND DISPOSITION OF UNDESIRABLE MAN-MADE FEATURES

- A. All other obstructions, such as abandoned utility lines, septic tanks, concrete foundations, and the like shall be removed from site. Excavations resulting from these removal activities shall be cleaned of all loose materials, dish shaped, and widened as necessary to permit access for compaction equipment. Areas exposed by any required over-excavation should be scarified to a depth of 12", moisture-conditioned to near optimum moisture content, and recompacted to at least 95% of the maximum dry density.

3.4 TESTING AND OBSERVATION

- A. All grading and earthwork operations shall be observed by the Geotechnical Engineer or his representative, serving as the representative of the Owner.
- B. Field compaction tests shall be made by the Geotechnical Engineer or his representative. If moisture content and/or compaction are not satisfactory, Contractor will be required to change equipment or procedure or both, as required to obtain specified moisture or compaction. Notify Geotechnical Engineer at least 48 hours in advance of any filling operation.
- C. Earthwork shall not be performed without the notification or approval of the Geotechnical Engineer or his representative. The Contractor shall notify the Geotechnical Engineer at least two (2) working days prior to commencement of any aspect of the site earthwork.

- D. If the Contractor should fail to meet the compaction or design requirements embodied in this document and on the applicable plans, he shall make the necessary readjustments until all work is deemed satisfactory, as determined by the Geotechnical Engineer or Architect/Engineer.
- E. After each rain event Geotechnical Engineer shall test fill material for optimum moisture. Do not place any fill material until desired moisture is achieved.

3.5 CLEARING AND GRUBBING

- A. Prior to grading, remove all debris off-site. Remove trees and brush including the root systems. Holes resulting from tree and brush removal should be prepared and backfilled in accordance with paragraphs 3.7, 3.8, 3.9, and 3.10. This may require deepening and/or widening the holes to adequately remove disturbed soil and provide room for compaction equipment. Strip the surface of all organics. Strippings meeting the requirements of Section 32 9000 may be used in landscape areas only.

3.6 CUTTING

- A. Building pads that are located within a cut/fill transition area will have to be overexcavated to provide a semi-uniform fill beneath the building pad. The portions of building pads located in cut areas shall be overexcavated to provide no more than 1 foot difference in fill placed in the same building pad.
- B. Do all cutting necessary to bring finish grade to elevations shown on Drawings.
- C. When excavation through roots is necessary, cut roots by hand.
- D. Carefully excavate around existing utilities to avoid unnecessary damage. The contractor shall anticipate and perform hand work near existing utilities as shown on the survey, without additional claims or cost.

3.7 STRUCTURAL EXCAVATION

- A. General: Excavate to bear on firm material at contract depth shown on Structural Drawings.
- B. Footings: All footing excavations shall be of sufficient width for installation of formwork, unless earth will retain its position during concreting. All portions of footings above grade must be formed. In the event that footings are placed against earth, footing widths below grade shall be increased 2 inches from those shown on Drawings and positive protection shall be provided for top corners of trench.
- C. Unsuitable Ground: Any errors in structural excavation, soft ground, or clay soils found when excavating shall be reported to Architect. In no case shall work be built on any such soft or clayey unsuitable surface without direction from the Architect. Restore excavations to proper elevation with engineered fill material compacted to 95% of dry density.

**EARTHWORK
SECTION 31 0000
3595001**

3.8 SUBGRADE PREPARATION

- A. Grade compact and finish all subgrades within a tolerance of 0.10' of grades as indicated on Drawings and so as not to pool water. Subgrade within building pads and concrete walks shall be within 0.05' of grades indicated.
- B. After clearing, grubbing and cutting, subsurface shall be plowed or scarified to a depth of at least 12", until surface is free from ruts, hummocks or other uneven features. Moisture condition to 2% above optimum moisture content and recompact to at least 95% of the maximum dry density as determined by ASTM Test Method D1557. If the existing soils are at a water content higher than specified, the contractor shall provide multiple daily aerations by ripping, blading, and/or discing to dry the soils to a moisture content where the specified degree of compaction can be achieved. After seven consecutive working days of daily aerations, and the moisture content of the soil remains higher than specified, the contractor shall notify the architect. If the existing soils have a moisture content lower than specified, the contractor shall scarify, rip, water and blade existing soil to achieve specified moisture content. The contractor shall make proper allowance in schedule and methods to complete this work.
- C. After subgrade for fill within building pad area or within paved areas has been cleared, plowed and scarified, it shall be disked or bladed until uniform and free from large clods, brought to 2% above optimum moisture content and compacted to not less than 95% of maximum dry density, as determined by ASTM Test Method D1557, and such expressed percentage thereof will be minimum acceptable density for specified work.
- D. Subgrade in areas to receive landscaping shall be compacted to (85%).
- E. Where Contractor over-excavates building pads through error, resulting excavation shall be recompacted as engineered fill at Contractor's expense.

3.9 PLACING, SPREADING AND COMPACTING FILL MATERIAL IN BUILDING PAD AND PAVEMENT AREAS

- A. Selected fill material shall be placed in layers which, when compacted, shall not exceed 6 inches in compacted thickness. Each layer shall be spread evenly and thoroughly mixed to insure uniformity in moisture content.
- B. Selected fill material shall be moisture-conditioned to specified moisture content. Selected fill material shall be unfrozen. When moisture content of fill material is below that specified, add water until proper moisture content is achieved. When moisture content is above that specified, aerate by blading or other methods mentioned in 3.08 B until moisture content is satisfactory.
- C. After each layer has been placed, mixed and spread evenly, it shall be thoroughly compacted to a minimum of 90% as determined by the ASTM D1557 Compaction Test. Compact each layer over its entire area until desired density has been obtained.
- D. Recomposition of Fill in Trenches and Compaction of Fill Adjacent to Walls: Where trenches must be excavated, backfill with material excavated. Place in lifts that when compacted do not exceed 6", moisture conditioned to (optimum)(2% above optimum)

moisture content, and compact to a minimum of 90% relative compaction in building pad and paved areas, and to 90% relative compaction in landscape areas.

- E. Jetting of fill materials will not be allowed.

3.10 FINAL SUBGRADE COMPACTION

- A. Building Pads: Upper 12" of all final building pad subgrades (including future buildings) shall be uniformly compacted at specified moisture content to at least 90% of maximum dry density, as determined by ASTM D1557 Compaction Test, regardless of whether final subgrade elevation is attained by filling, excavation, or is left at existing grade. After acceptance of final compaction test, contractor shall maintain the required moisture content of subgrade until concrete flatwork is placed.
- B. Paved Areas: Upper 12" of all final subgrades supporting pavement sections and all other flatwork shall be brought to specified moisture content and shall be uniformly compacted to not less than 95% of maximum dry density, regardless of whether final subgrade elevation is attained by filling, excavation, or is left at existing grade. After acceptance of final compaction test, contractor shall maintain the required moisture content of subgrade until concrete flatwork is placed.
- C. Other Fill and Backfill: Upper 12" of all other final subgrades or finish grades shall be compacted to 90% of maximum dry density.
- D. Gravel Fill: Do not place compacted gravel fill until after underground work and foundations are in place. Compact gravel fill with vibratory plate or similar equipment to preclude settlement.

3.11 PLACING, SPREADING, AND COMPACTION OF LANDSCAPE BACKFILL MATERIALS

- A. All landscaped areas shall receive topsoil. After subgrade under landscape area has been scarified and brought to 85% maximum dry density, top soil shall be placed evenly to depth of 12" at 85% of maximum dry density.
- B. Project Inspector must verify that materials are uniformly spread to minimum depth specified.

3.12 SLOPE CONSTRUCTION

- A. Cut slopes shall be constructed to no steeper than 2:1(horizontal:vertical). Fill slopes shall be constructed to no steeper than 2:1 (horizontal:vertical). Prior to placement of fill on an existing slope the existing slope shall be benched. The benches shall be in a ratio of 2 horizontal to 1 vertical. The face of the fill slopes shall be compacted as the fill is placed, or the slope may be overbuilt and then cut back to the design grade. Compaction by track walking will not be allowed.

3.13 FINISH GRADING

- A. At completion of project, site shall be finished graded, as indicated on Drawings. Finish grades shall be "flat graded" to grades shown on the drawing. Mounding of finish grades

EARTHWORK
SECTION 31 0000
3595001

will not be allowed unless otherwise directed on the landscape drawings. Tolerances for finish grades in drainage swales shall be $\pm 0.05'$. Tie in new and existing finish grades. Leave all landscaped areas in finish condition for lawn seeding. Landscaped planters shall be graded uniformly from edge of planter to inlets. If sod is used for turf areas the finish grade on which it is placed shall be lowered to allow for sod thickness.

- B. All landscape areas shall be left free of rock or foreign material.
- C. All landscape areas shall be approved by Architect prior to any planting.

3.14 SURPLUS MATERIAL

- A. Excavated material not required for grading or backfill shall be removed from site at contractor's expense.

3.15 CLEANING

- A. Refer to Section 01 7700.
- B. Remove from fill all vegetation, wood, form lumber, casual lumber, and shavings, in contact with ground; buried wood will not be permitted in any fill.

END OF SECTION

s:\master specifications\division 31 - earthwork\31 0000_earthwork.docx
Received from WCEI: June 7, 2018, Updated format: 9-3-21

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Trench backfill materials.

1.2 RELATED REQUIREMENTS

- A. Section 01 5000, Temporary Facilities and Controls.
- B. Section 01 8113, Sustainable Design Requirements, for CAL-Green **[and Collaborative for High Performance Schools (CHPS)]** general requirements and procedures.
- C. Section 31 0000, Earthwork.
- D. Section 32 8000, Irrigation.
- E. Section 33 0000, Utilities
- F. Section 33 4000, Storm Drainage Utilities.

1.3 REREENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CAL Green), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- C. California Plumbing Code (CPC), edition as noted on the drawings.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Submittal Procedures:
 - 1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
 - 2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
 - 3. Sustainable Design Submittals shall comply with the additional requirements of Section 01 8113, Sustainable Design Requirements.
- B. Coordination:
 - 1. General Contractor shall coordinate work as herein specified, in accordance with drawings and as required to complete scope of work with all related trades.

TRENCHING AND BACKFILLING
SECTION 31 2333
3595001

1.5 ACTION SUBMITTALS

- A. Provide supplier's descriptive literature for all products to demonstrate compliance with specified attributes:

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For contractor / Installer.

1.7 CLOSEOUT SUBMITTALS

- A. Guarantee: Submit subcontractor's guarantee.

1.8 QUALITY ASSURANCE

- A. Contractor / Installer shall have been in business for five (5) years providing/finishing similar size projects and complexity.
- B. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.
- C. All materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.

1.9 DELIVERY, STORAGE AND HANDLING

- A. Transport, store and handle in strict accord with the local jurisdiction.

1.10 FIELD CONDITIONS

- A. Contractor shall acquaint himself with all existing site conditions. If unknown active utilities are encountered during work, notify Architect promptly for instructions. Failure to notify will make Contractor liable for damage to these utilities arising from Contractor's operations subsequent to discovery of such unknown active utilities.
- B. Trench dewatering may be necessary. Contractor shall provide any and all tools, equipment and labor necessary for trench dewatering no matter what the source. Dewatering shall be continuous until all site utilities are installed and backfilled.

1.11 PROTECTION

- A. Adequate protection measures shall be provided to protect workers and passers-by on and off the site. Adjacent property shall be fully protected throughout the operations. Blasting will not be permitted. Prevent damage to adjoining improvements and properties both above and below grade. Restore such improvements to original condition should damage occur. Replace trees and shrubs outside building area disturbed by operations. Repair all trenches in grass areas with new sod (seeding not permitted) and "stake-off" for protection.

TRENCHING AND BACKFILLING
SECTION 31 2333
3595001

- B. Contractor shall be solely and completely responsible for working conditions at the job site, including safety of all persons and property during performance of the work. This requirement shall apply continuously and shall not be limited to normal working hours.
- C. Any construction review of the Contractor's performance conducted by the Architect or Owner is not intended to include review of the adequacy of the Contractor's safety measures, in, on or near the construction site.
- D. Provide shoring, sheeting, sheet piles and or bracing to prevent caving, erosion or gulying of sides of excavation.
- E. Surface Drainage: Provide for surface drainage during period of construction in manner to avoid creating nuisance to adjacent areas. Keep all excavations free from water during entire progress of work, regardless of cause, source or nature of water.
- F. Adjacent streets and sidewalks shall be kept free of mud, dirt or similar nuisances resulting from earthwork operations.
- G. The site and adjacent influenced areas shall be watered as required to suppress dust nuisance.
- H. Trees: Carefully protect existing trees which are to remain.

1.12 TRENCH SAFETY PROVISIONS

- A. General Contractor shall be solely responsible for safety design, construction and coordination with agencies having jurisdiction. If such plan varies from shoring system standards established by Construction Safety Orders, plan shall be prepared by registered civil or structural engineer.
- B. Nothing herein shall be deemed to allow use of shoring, sloping or protective system less effective than that required by Construction Safety Orders of California State Division of Industrial Safety.
- C. When trenching through paved surface, provide steel trench plates to cover open trenches daily until trenches are backfilled.

1.13 SEASONAL LIMITS

- A. No backfill material shall be placed, spread or rolled during unfavorable weather conditions. When work is interrupted by heavy rains, full operations shall not be resumed until field tests indicate that moisture content and density of fill are satisfactory.
- B. Material above optimum moisture shall be processed per Section 31 0000, Part 3, Article "Subgrade Preparation".

1.14 TESTING

- A. General: Refer to Section 31 0000, Part 1, Article "Testing" and Part 3, Article "Testing and Observation".

TRENCHING AND BACKFILLING
SECTION 31 2333
3595001

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Backfill materials: Pipeline and conduit trench backfill as shown on the plans and as specified below.
 - 1. $\frac{3}{4}$ inch crush rock.
 - 2. Native Materials: Soil native to Project Site, free of wood, organics, and other deleterious substances. Rocks shall not be greater than 3-inches.
 - 3. Sand: Fine granular material, free of organic matter, mica, loam or clay.
 - 4. Lean Mix Concrete: 3 sacks of cement per yard plus sand.
 - 5. Class 2 aggregate base, $\frac{3}{4}$ " rock, per Caltrans Section 26-1.02B
 - 6. Controlled Density Fill: 3 sack slurry backfill.
- B. Water: Furnish all required water for construction purposes, including compaction and dust control. Water shall be potable.
- C. Provide other bedding and backfill materials as described and specified in Section 33 0000, Section 33 4000 and Divisions 22 and 26.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verification of Conditions:
 - 1. Examine areas and conditions under which work is to be performed.
 - 2. Identify conditions detrimental to proper or timely completion of work and coordinate with General Contractor to rectify.

3.2 INSTALLATION

- A. Perform work in accordance with pipe manufacturer's recommendations, as herein specified and in accordance with drawings.

3.3 TRENCHING

- A. Make all trenches open vertical construction with sufficient width to provide free working space at both sides of trench around installed item as required for caulking, joining, backfilling and compacting; not less than 12 inches wider than pipe or conduit diameter, unless otherwise noted.
- B. Carefully excavate around existing utilities to avoid unnecessary damage. The contractor shall anticipate and perform hand work near existing utilities as shown on the survey, without additional claims or cost.
- C. Trench straight and true to line and grade with bottom smooth and free of edges or rock points.

TRENCHING AND BACKFILLING
SECTION 31 2333
3595001

- D. Where depths are not shown on the plans, trench to sufficient depth to give minimum fill above top of installed item measured from finish grade above the utility as follows:
1. Sewer pipe: depth to vary
 2. Storm drain pipe: depth to vary
 3. Water pipe - Fire Supply: 36 inches
 4. Water pipe – Domestic Supply: 30 inches

3.4 BACKFILL

- A. Pipe Trench Backfill is divided into three zones:
1. Bedding: Layer of material directly under the pipe upon which the pipe is laid.
 2. Pipe Zone: Backfill from the top of the bedding to 6 inches (compacted) over the top of the pipe.
 3. Upper Zone: Backfill between top of Pipe Zone and to surface of subgrade.
- B. Bedding: Type of material and degree of compaction for bedding backfill shall be as defined in the Details and Specifications.
- C. Pipe Zone and Upper Zone Backfill:
1. Type of material and degree of compaction Pipe Zone and Upper Zone Backfill shall be as required by Drawings, Details, & Specifications.
 2. Upper Zone Backfill shall not be placed until conformance of Bedding and Pipe Zone Backfill with specified compaction test requirements has been confirmed.
 3. Backfill shall be brought up at substantially the same rate on both sides of the pipe and care shall be taken so that the pipe is not floated or displaced. Material shall not be dropped directly on pipe.
- D. Backfill Compaction:
1. Backfill shall be placed in layers which, when compacted shall not exceed 6 inches in thickness. Each layer shall be spread evenly and thoroughly mixed to insure uniformity. Do not backfill over, wet, frozen or soft subgrade surfaces. Employ a placement method that does not disturb or damage foundation walls, perimeter drainage, foundation damp-proofing, waterproofing or protective cover.
 2. When moisture content of fill material is below that required to achieve specified density, add water until proper moisture content is achieved. When moisture content is above that required, aerate by blading or other methods until specified moisture content is met; see Section 31 0000, Part 3, Article "Subgrade Preparation".
 3. After each layer has been placed, mixed and spread evenly, it shall be thoroughly compacted to 95% of maximum dry density while at specified moisture content. Compact each layer over its entire area until desired density has been obtained.
 4. Compaction: All backfill operations shall be observed by the Inspector of Record and/or Geotechnical Engineer. Field density tests shall be made to check compaction of fill material. If densities are not satisfactory, Contractor will be

TRENCHING AND BACKFILLING
SECTION 31 2333
3595001

required to change equipment or procedure or both, as required to obtain specified densities. Notify Inspector and Architect at least 24 hours in advance of any operation.

E. Backfill in Areas Previously Lime or Cement Treated

1. Where trenching occurs in areas that have been lime or cement treated, class 2 aggregate bases or approved controlled density backfill material shall be used for the top 12-inches minimum of the trench or thickness shall match the depth of treated material.

3.5 TRENCH AND SITE RESTORATION

- A. Finished surface of trenches shall be restored to a condition equal to, or better than the condition as existed prior to excavation work.

3.6 PROTECTION

- A. Protect existing surfaces, structures, and utilities from damage. Protect work by others from damage. In the event of damage, immediately repair or replace to satisfaction of Owner.
- B. Repair existing landscaped areas to as new condition. Replant trees, shrubs or groundcover with existing materials if not damaged or with new materials if required. Replace damaged lawn areas with sod, no seeding will be permitted.
- C. Replace damaged pavement with new compatible matching materials. Concrete walks to be removed to nearest expansion joint and entire panel replaced. Asphalt to be cut neatly and replaced with new materials.
- D. Any existing materials removed or damaged due to trenching to be returned to new condition.

3.7 SURPLUS MATERIAL

- A. Remove excess excavated material, unused materials, damaged or unsuitable materials from site.

3.8 CLEANING

- A. Refer to Section 01 7700.
- B. Contractor will keep the work areas in a clean and safe condition so his rubbish, waste, and debris do not interfere with the work of others throughout the project and at the completion of work.
- C. After completion of work in this section, remove all equipment, materials, and debris. Leave entire area in a neat, clean, acceptable condition.

TRENCHING AND BACKFILLING
SECTION 31 2333
3595001

END OF SECTION

s:\master specifications\division 31 - earthwork\31 2333_trenching and backfilling.docx
Received from WCEI: October 20, 2012; Updated 9-2-21

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Aggregate.
 - 2. Asphalt paving.
 - 3. Seal coat.
 - 4. Wood headers and stakes.
 - 5. Pavement marking.
 - 6. Precast concrete bumpers.

1.2 RELATED REQUIREMENTS

- A. Section 01 5000, Temporary Facilities and Controls.
- B. Section 01 6116, Volatile Organic Compound (VOC) Restrictions, for VOC limits pertaining to adhesives, sealants, fillers, primers, and coatings.
- C. Section 01 8113, Sustainable Design Requirements, for CAL-Green **[and Collaborative for High Performance Schools (CHPS)]** general requirements and procedures.
- D. Section 31 0000, Earthwork.
- E. Section 31 2333, Trenching and Backfilling.
- F. Section 32 8000, Irrigation.
- G. Section 33 0000, Utilities.
- H. Section 33 4000, Storm Drainage Utilities.

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CAL Green), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- C. Local Jurisdiction: Any work within the street, highway or right-of-way shall be performed in accordance with the requirement of the governmental agencies having jurisdiction, and shall not begin until all of those governing authorities have been notified.
- D. ASTM International (ASTM):

ASPHALT CONCRETE PAVING
SECTION 32 1200
3595001

1. D698-00 Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures, Using 5.5 lb (2.49 Kg) Rammer and 12 inch (304.8 mm) Drop.
2. D1556-00 Test Method for Density of Soil in Place by the Sand-Cone Method.
3. D1557-02 Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 10 lb. (4.54 Kg) Rammer and 18 inch (457 mm) Drop.
4. D6628-16 Standard Specification for Color of Pavement Marking Materials.
5. D3017-05 Test Methods for Moisture Content of Soils and Soil-Aggregate Mixture by Nuclear Methods (Shallow Depth).
6. D4318-05 Test Method for Liquid Limit, Plastic Limit, and Plasticity Limit.

E. CALTRANS Standard Specifications.

F. CAL-OSHA, Title 8, Section 1590 (e).

1.4 ADMINISTRATION REQUIREMENTS

A. Submittal Procedures:

1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
3. Sustainable Design Submittals shall comply with the additional requirements of Section 01 8113, Sustainable Design Requirements.

1.5 ACTION SUBMITTAS

A. Provide supplier's descriptive literature for all products to demonstrate compliance with specified attributes.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Contractor / Installer.

B. Sustainable Design:

1. General
 - a. Submit information necessary to establish and document compliance with the California Green Building Standards Code.
 - b. Sustainable design submittals are in addition to other submittals.
2. The following information shall be provided:
 - a. Adhesives and Sealants: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.
 - b. Paints and Coatings: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.

1.7 CLOSEOUT SUBMITTALS

- A. Guarantee: Submit subcontractor's guarantee.

1.8 QUALITY ASSURANCE

- A. Contractor / Installer shall have been in business for five (5) years providing/finishing similar size projects and complexity.
- B. Contractor shall be solely responsible for all subgrades built. Any repairs resulting from inadequate compaction is the responsibility of the contractor.
- C. The representatives of the Owner's testing lab will not act as supervisor of construction, nor will they direct construction operations. Neither the presence of the Owner's testing lab representatives nor the testing by the Owner's testing lab shall excuse the contractors or subcontractors for defects discovered in their work during or following completion of the project. Correcting inadequate compaction is the sole responsibility of the contractor.
- D. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.
- E. All materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.
- F. Contractor shall provide verification that asphalt mix temperature meets the requirements of this specification at time of application.
- G. Tests (See Part 1, Article "Testing").

1.9 DELIVERY, STORAGE AND HANDLING

- A. Transport, store and handle in strict accord with the local jurisdiction.

1.10 FIELD CONDITIONS

- A. Environmental Requirements:
 - 1. Base Course: Do not lay base course on muddy subgrade, during wet weather, or when atmospheric temperature is below 40 degrees F.
 - 2. Asphalt Surfacing: Do not apply asphaltic surfacing on wet base, during wet weather, or when atmospheric temperature is below 50 degrees F.

1.11 EXISTING SITE CONDITIONS

- A. Contractor shall acquaint himself with all site conditions. If unknown active utilities are encountered during work, notify Architect promptly for instructions. Failure to notify will make Contractor liable for damage to these utilities arising from Contractor's operations subsequent to discovery of such unknown active utilities.

1.12 PROTECTION

- A. Adequate protection measures shall be provided to protect workmen and passers-by on and off the site. Adjacent property shall be fully protected throughout the operations. Blasting will not be permitted. Prevent damage to adjoining improvements and properties both above and below grade. Restore such improvements to original condition should damage occur. Replace trees and shrubs outside building area disturbed by operations.
- B. In accordance with generally accepted construction practices, the Contractor shall be solely and completely responsible for working conditions at the job site, including safety of all persons and property during performance of the work. This requirement shall apply continuously and shall not be limited to normal working hours.
- C. Any construction review of the Contractor's performance conducted by the owner's representative is not intended to include review of the adequacy of the Contractor's safety measures, in, on, or near the construction site.
- D. Surface Drainage: Provide for surface drainage during period of construction in manner to avoid creating nuisance to adjacent areas. The contractor shall make a reasonable effort on a daily basis to keep all excavations and the site free from water during entire progress of work, regardless of cause, source, or nature of water.
- E. Adjacent streets and sidewalks shall be kept free of mud, dirt or similar nuisances resulting from earthwork operations.
- F. The site and adjacent influenced areas shall be watered as required to suppress dust nuisance. Dust control measures shall be in accordance with the local jurisdiction.

1.13 SEASONAL LIMITS

- A. No fill material shall be placed, spread or rolled during unfavorable weather conditions. When work is interrupted by rains, fill operations shall not be resumed until field tests indicate that moisture content and density of fill are satisfactory.

1.14 TESTING

- A. General: Refer to Section 01 4523 – TESTING & INSPECTION SERVICES AND STRUCTURAL TESTS AND INSPECTIONS LIST, DSA-103.
- B. Geotechnical Engineer: Owner is retaining a Geotechnical Engineer to determine compliance of fill with Specifications, and to direct adjustments in fill operations. Costs of Geotechnical Engineer will be borne by Owner; except those costs incurred for re-tests or re-inspection will be paid by Owner and backcharged to Contractor.

PART 2 - PRODUCTS

2.1 DESIGN AND PERFORMANCE CRITERIA

- A. Sustainable Design:

**ASPHALT CONCRETE PAVING
SECTION 32 1200
3595001**

1. VOC emissions for field-applied adhesives, sealants, and sealant primers must comply with limits specified in Section 01 6116.
2. VOC emissions for field-applied paints and coatings must comply with limits specified in Section 01 6116.

2.2 MATERIALS

- A. Sterilant: Soil sterilizer shall be CIBA GEIGY's Pramitol 25-E, Treflan EC or Thompson-Hayward Casoron.
 1. Soil sterilizer shall be applied in strict accordance with manufacturer's instructions.
- B. Base Course Aggregate: State Specifications, Section 26, Class 2 aggregate base (3/4" max.).
- C. Asphalt Binder: Steam-refined paving asphalt conforming to State Specifications, Section 92, viscosity grade PG 64-10. Asphalt binder additives for HMA per Caltrans approved list of manufacturers.
- D. Liquid Asphalt Tack Coat: Per CALTRANS section 94.
- E. Surface Course Aggregate: Mineral aggregates for Type "B" asphalt concrete, conforming to State Specifications 39-2.02, Type B, 1/2" maximum, medium gradient. 3/8" maximum gradient at Playcourt.
- F. Seal Coat: shall be a pre-mixed asphalt emulsion blended with select fillers and fibers such as:
 1. "Park-Top No. 302", Western Colloid Products.
 2. "Overcoat", Reed and Gram.
 3. "Drivewalk", Conoco Oil.
- G. Wood Headers and Stakes: Pressure treated.
- H. Pavement Marking: Colors as directed by Architect. Colors of painted traffic stripes and pavement markings must comply with ASTM D6628.
 1. Waterborne traffic line - colors white, yellow and red, State specification PTWB-01R3.
 2. Waterborne traffic line for the international symbol of accessibility and other curb markings – blue, red and green, Federal specification TT-P-1952F.
- I. Precast Concrete Bumpers: 3000 psi at 28 day minimum strength; 48" length unless otherwise indicated; provide with steel dowel anchors and concrete epoxy.
- J. Pavement Epoxy; K-Lite; KtepX-590; Ennis Epoxy HPS2 or an approved equal.
- K. Crack Filler; QPR model CAR08, 10oz asphalt crack filler; Star STA-FLEX Trowel Grade crack filler or approved equal.

ASPHALT CONCRETE PAVING
SECTION 32 1200
3595001

- L. Reclaimed Asphalt Paugment (RAP). HMA Type A or Type B may be produced using RAP providing it does not exceed 15% or the aggregate blend.

2.3 MIXES

- A. General: Plant mixed conforming to State Specifications, Section 39, Type B, 1/2" maximum, medium grading. 3/8" maximum grading shall be used at hardcourt.
- B. Temperature of Hot Mix Asphalt: Not less than 275 degrees F nor more than 325 degrees F when added to aggregate.
- C. Temperature of Hot Mix Aggregate: Not less than 250 degrees F nor more than 325 degrees F when asphalt is added.
- D. Temperature of Hot Mix Asphalt Concrete: Asphalt shall be not less than 285 degrees at time of application, nor more than 350 degrees. Asphalt not meeting the required temperature shall not be used.
- E. Temperature of Warm Mix Asphalt: Mixing and placement; per the approved manufactures heat range recommendations for mixing and placement.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Conditions of Work in Place: Subsurfaces which are to receive materials specified under this Section shall be carefully examined before beginning work hereunder, and any defects therein shall be reported, in writing, to the Architect. Work shall not be started until such defects have been corrected. Starting of work shall imply acceptance of conditions as they exist.

3.2 PREPARATION

- A. Sub-Grade: Clean, shape and compact to hard surface free from elevations or depressions exceeding 0.05' in 10' from true plan. Compact per Section 31 0000. Compaction and moisture content shall be verified immediately prior to placement of aggregate base. Proof roll subbase in presence of geotechnical engineer prior to placement of aggregate base.

3.3 INSTALLATION

- A. Headers:
 - 1. General: Install as edging to asphalt paving, except where adjoining existing pavement, concrete curbs, walks or building.
 - 2. Existing Headers: Remove existing headers where new paving will join existing. Saw cut existing asphalt to provide clean edge.
 - 3. Lines and Levels: Install true to line and grade. Cut off tops of stakes 2-inches below top of header so they will not be visible on completion of job.

**ASPHALT CONCRETE PAVING
SECTION 32 1200
3595001**

B. Asphalt Paving:

1. Base Course: Install in accord with State Specifications, Section 26. Compact to relative compaction of not less than 95%, ASTM D1557. The material shall be deposited on the subgrade in such a manner as to provide a uniform section of material within five percent tolerance of the predetermined required depth. Deposition will be by spreader box or bottom dump truck to prevent segregation of the material. The material so deposited on the subgrade shall have sufficient moisture which, in the opinion of the Architect is adequate to prevent excessive segregation. It shall then be immediately spread to its planned grade and cross section. Undue segregation of material, excessive drifting or spotting of material will not be permitted. If in the opinion of the site geotechnical engineer, the material is unsuitably segregated, it shall be removed or completely reworked to provide the desired uniformity of the material.
 - a. Moisture content and compaction of base material shall be tested immediately prior to placement of asphalt paving.
2. Sterilant: Apply specified material at manufacturer's recommended rate. Applicator of sterilant material shall be responsible for determining location of all planter areas. Apply specified material over entire base course area just prior to application of asphalt. Follow manufacturer's printed directions.
3. Liquid Asphalt Tack Coat: Apply as "tack coat" to all vertical surfaces of existing paving, curbs, walks, and construction joints in surfacing against which paving is to be placed.
4. Asphalt Concrete Surface Course:
 - a. Comply with State Specifications, 39-6 except as modified below.
 - 1) Final gradation shall be smooth, uniform and free of ruts, humps, depressions or irregularities, with a minimum density of 91% of the theoretical maximum specific gravity determined by California Test Method #309. Maximum variation 1/8 inch in 10' when measured with steel straightedge in any one direction. Test paved areas for proper drainage by applying water to cover area. Correct portions that do not drain properly by patching with plant mix. In no case shall accessible parking spaces or loading and unloading areas exceed 2% slope in any direction.
 - 2) Asphalt material shall be delivered to the project site in a covered condition to maintain acceptable temperature.
5. Placement and adjustment of Frames, Covers, Boxes and Grates: The Contractor shall set and adjust to finish grade all proposed and existing frames, covers, boxes, and grates of all manholes, drop inlets, drain boxes, valves, cleanouts, electrical boxes and other appurtenant structures prior to placement of asphaltic concrete.
6. Water Testing: All paved areas shall be water tested, to check drainage, in the presence of the project inspector prior to placement of seal coat. The surface of asphalt paving shall not vary more than 1/8 inch above or below the grade established on the plans. If variations in grade are present, they will be corrected by overlaying paving and/or pavement removal and replacement as directed by the Architect.

**ASPHALT CONCRETE PAVING
SECTION 32 1200
3595001**

7. Patching: Cut existing paving square and plumb at all edges to be joined by new paving. In trenches; grind existing asphalt on each side of trench 3" wide x 1/2 the depth of the section. Apply tack coat to vertical surfaces before installing new work. Warp carefully to flush surface, with seal over joints, and feather edge. Sawcut, remove and patch existing paving where cutting is necessary for installation of piping or conduits under Divisions 15, 16 and 33.
8. Seal Coat:
 - a. Seal coat shall be applied no sooner than 30 days from time of asphalt placement.
 - b. Surface Preparation: surface shall be clean of all dirt, sand, oil or grease. Hose down entire area with a strong jet of water to remove all debris. Remove soft, loose, or otherwise damaged areas of asphalt concrete to full depth of damage and replace with compacted asphalt concrete as specified herein. Minor holes and imperfections may be patched using hot mix asphalt or mastic using sand/SS-1-H. Use wire brush for removal of oil and grease; prime with shellac or synthetic resin as recommended by manufacturer of pavement sealer material.
 - c. Seal Coat Seal Application: Thoroughly mix materials in the presence of the onsite inspector. Failure to do so will be cause for rejection. Apply in accordance with manufacturer's written instructions.
 - a. The minimum application rate for each applied coat shall be 30gals per 1000 sq. ft. Two coats of sealcoat will be required.
 - b. Clean-Up and Precautions: As recommended by pavement sealer material manufacturer.
 - d. Clean-Up and Precautions: As recommended by pavement sealer material manufacturer.
- C. Pavement Marking: painted pavement markings shall be done only after the seal coat has thoroughly dried. On clean surfaces to be painted with traffic paint of dust, dirt, grime, oil, rust or other contaminants which will impair the quality of work or interfere with proper bond of paint coats. Surfaces shall be cleaned to the extent and by whatever means that will satisfactorily accomplish the purpose without damage to asphalt concrete. Provide measured layouts, temporary markings, templates, and other means necessary to provide required marking. Prepare and apply paint in accordance with manufacturer's instructions; paint shall be applied by spray and shall achieve complete coverage free from voids and thin spots. Where indicated on the Drawings, paint parking stall strips, lettering, arrows, accessible symbols, playground markings, game striping, maps, etc. on concrete paving or asphalt concrete paving. Paint stripes shall be 4 inches wide (except otherwise indicated) and applied with two (2) coats of herein specified Traffic Line Paint; white (except as otherwise specified or indicated).
 1. International Accessible Symbol: Symbol shall be white figures on a blue background. Blue shall be equal to color No. 15090 in Fed. Std. 595c. Lines and symbols shall be accurately formed and true to line and form; lines shall be straight and uniform in width. Painted edges shall be clean cut and free from raggedness, and corners shall be cut sharp and square. Tolerances: Apply striping within a tolerance 1/2 inch in 50 feet. Apply markings and striping to widths indicated with a tolerance of 1/4 inch on straight sections and 1/2 inch on curved sections.

ASPHALT CONCRETE PAVING
SECTION 32 1200
3595001

- D. Colors: As directed by Architect
- E. Precast Concrete Bumpers: Install where shown, using steel dowels, and epoxy applied for length to wheel stop without damage to bumpers or asphalt concrete paving.

3.4 CLEANING

- A. Upon completion of work of this Section promptly remove from the working area all scraps, debris and surplus material of this Section.
- B. Clean excess material from surface of all concrete walks and utility structures.

END OF SECTION

*s:\master specifications\division 32 - site improvements\32 1200_asphalt concrete paving.docx
Received from WCEI: December 18, 2020, Format Updated 9-8-21*

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Concrete curbs and gutters.
2. Concrete pavement, sidewalks and ramps.
3. Steel reinforcing for flatwork and curbs.
4. Truncated domes.

1.2 RELATED REQUIREMENTS

- A. Section 01 6116, Volatile Organic Compound (VOC) Restrictions; for VOC limits pertaining to adhesives, sealants, fillers, primers, and coatings.
- B. Section 01 8113, Sustainable Design Requirements, for CAL-Green **[and Collaborative for High Performance Schools (CHPS)]** general requirements and procedures.
- C. Division 31, Earthwork.
- D. Section 32 1200, Asphalt Concrete Paving.

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CALGreen), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- C. American Concrete Institute (ACI):
1. 117: Specification for Tolerances for Concrete Construction and Materials and Commentary.
 2. 211.1: Standard Practice for Selecting Proportions for Normal, Heavyweight and Mass Concrete.
 3. 301: Specifications for Structural Concrete.
 4. 302.1R: Guide to Concrete Floor and Slab Construction.
 5. 305R: Guide to Hot Weather Concreting.
 6. 306R: Guide to Cold Weather Concreting.
 7. 308R: Guide to External Curing of Concrete.
 8. 318: Building Code Requirements for Structural Concrete and Commentary.
 9. 347R: Guide to Formwork for Concrete.
- D. ASTM International (ASTM):

1. A615/A615M: Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement.
 2. A706/A706M: Standard Specification for Deformed and Plain Low-Alloy Steel Bars for Concrete Reinforcement.
 3. C33/C33M: Standard Specification for Concrete Aggregates.
 4. C94/C94M: Standard Specification for Ready-Mixed Concrete.
 5. C143/C143M: Standard Test Method for Slump of Hydraulic-Cement Concrete.
 6. C150/C150M: Standard Specification for Portland Cement.
 7. C260/C260M: Standard Specification for Air-Entraining Admixtures for Concrete.
 8. C309: Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete.
 9. C330/C330M: Standard Specification for Lightweight Aggregates for Structural Concrete.
 10. C494/C494M: Standard Specification for Chemical Admixtures for Concrete.
 11. C618: Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete.
 12. C920: Standard Specification for Elastomeric Joint Sealants.
 13. C1107/C1107M: Standard Specification for Packaged Dry, Hydraulic Cement Grout (Non-Shrink).
 14. C1315: Standard Specification for Liquid Membrane-Forming Compounds Having Special Properties for Curing and Sealing Concrete.
 15. D1751: Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types).
 16. D5893/D5893M: Standard Specification for Cold Applied, Single Component, Chemically Curing Silicone Joint Sealant for Portland Cement Concrete Pavements.
- E. Concrete Reinforcing Steel Institute (CRSI):
1. Manual of Standard Practice.
 2. Placing Reinforcing Bars.
- F. State of California, Department of Transportation (Caltrans):
1. Division of Engineering Services:
 - a. California Test 342: Method of Test for Surface Skid Resistance with the California Portable Skid Test.
 2. Standard Specifications.
 - a. Section 51, Concrete Structures.
 - b. Section 52, Reinforcement.
 - c. Section 73, Concrete Curbs and Sidewalks.
 - d. Section 90, Concrete.
- G. US Government General Services Administration (GSA/SAE):

1. GSA/SAE AMS-STD-595A: Colors Used In Government Procurement.

1.4 ADMINISTRATIVE REQUIREMENTS

A. Submittal Procedures:

1. Action Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
3. Sustainable Design Submittals shall comply with the additional requirements of Section 01 8113, Sustainable Design Requirements.

1.5 ACTION SUBMITTALS

A. Shop Drawings: Joint pattern layout for walks and pavement.

B. Product Data:

1. A complete list of materials proposed to be used for the site concrete work including, but not limited to, sand, gravel, admixtures, surface treatments, coloring agents, sealers, cast-in-place accessories, forming and curing products, concrete mix designs, reinforcing materials, joint materials, curing materials, and detectable warning surface.
2. Manufacturer's descriptive literature for products proposed for use. Include installation instructions, and maintenance instructions.

C. Concrete Mix Design: The Contractor shall submit three copies of each proposed mix design for each class of concrete in accordance with ACI 301, Sections 3.9 "Proportioning on the Basis of Previous Field Experience or Trial Mixture," or 3.10 "Proportioning Based on Empirical Data." The Contractor shall submit a separate mix design for concrete to be placed by pumping, in addition to the mix design for concrete to be placed directly from the truck chute.

1. The following information shall be included in the concrete mix design:
 - a. Proportions of cement, fine and coarse aggregate, and water.
 - b. Water-cement ratio, 28-day compressive design strength, slump, and air content.
 - c. Type of cement and aggregate.
 - d. Special requirements for pumping.
 - e. Range of ambient temperature and humidity for which design is valid.
 - f. Special characteristics of mix, which require precautions in mixing, placing, or finishing techniques to achieve specified finished product.
2. Do not begin concrete production until mixes have been reviewed and approved by Engineer.
 - a. Review of mix design by the Architect and Engineer shall in no way relieve the subcontractor of his responsibility for the performance of the concrete.

D. Qualification Data: For manufacturer

- E. Delivery tickets as specified for ready-mixed concrete.
- F. Sustainable Design:
 - 1. General:
 - a. Submit information necessary to establish and document compliance with the California Green Building Standards Code.
 - b. Sustainable design submittals are in addition to other submittals.
 - 2. The following information shall be provided:
 - a. Adhesives and Sealants: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.
 - b. Paints and Coatings: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.

1.6 CLOSEOUT SUBMITTALS

- A. Guarantee: Submit subcontractor's guarantee.

1.7 QUALITY ASSURANCE

- A. Qualifications:
 - 1. Manufacturer of ready-mixed concrete products shall meet ASTM C94/C94M requirements for production facilities and equipment.
- B. Design, erect, support, brace and maintain formwork and shoring to safely support all loads that might be applied until such loads can be carried by concrete.
- C. The Contractor shall perform work in accordance with ACI 301.
- D. Use only new materials and products.
- E. Single-Source Responsibility: Use materials and products of one manufacturer whenever possible.
- F. Materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.
- G. Testing to determine compliance with the work of this Section will be the responsibility of the Contractor.
 - 1. Cement and reinforcing shall be tested in accordance with CBC Section 1910A. Testing of reinforcing may be waived in accordance with Section 1910A.2 when approved by the Engineer and DSA.
 - 2. Testing will be performed by an independent testing and inspecting agency in accordance with Section 01 4523, Testing and Inspection Services, and paid for by the Owner.
 - 3. Refer to Article FIELD QUALITY CONTROL in Part 3 of this Section for additional requirements.

4. Cost of retests and coring due to low strength or defective concrete will be paid by the Owner and back-charged to the Contractor.
- H. Sieve analysis from testing laboratories identifying rock/sand percentages within the concrete mix; or class 2 aggregate base shall have the current Project name and Project location identified on the report. Outdated analytical reports greater than 90 days old will not be accepted.
- I. Mockups: Provide on-site mockup panels for each type of exposed colored concrete flatwork showing texture and color before proceeding with finish to be used on this Project.
 1. Construct sample panels after review and approval of samples.
 2. Size: Minimum 5 feet square and have at least one longitudinal and one transverse joint unless a more specific note indicates otherwise on Drawings.
 3. Construct sample panels at location approved by Architect.
 4. Construct sample panels in ample time to allow for finishing and curing before requesting Architect to review.
 5. Follow procedures used on accepted samples.
 6. Include saw-cut and tooled joints to match method and appearance proposed for use in completed work.
 7. Prepare successive sample panels as required until finish, color, and appearance is approved by Architect.
 8. Do not remove sample panels until authorized in writing by the Architect and all concrete work has been approved.

1.8 DELIVERY, STORAGE AND HANDLING

- A. Deliver undamaged products to job in manufacturer's sealed containers and/or original bundles with tags and labels intact.
- B. Store materials in protected, dry conditions off of ground and in areas so as to not interfere with the progress of the Work.
- C. Transport, store and handle in strict accordance with the manufacturer's written recommendations.
- D. Store cement in weather tight building, permitting easy inspection and identification. Protect from dampness. Lumpy or stale cement will be rejected.
- E. Aggregates: Prevent excessive segregation, or contamination with other materials or other sizes of aggregate. Use only one supply source for each aggregate stock pile.

1.9 FIELD CONDITIONS

- A. Make and be responsible for all field dimensions necessary for proper fitting, slopes, and completion of work. Report discrepancies to Architect before proceeding.
- B. Do not place concrete during rain without adequate protection.

- C. The Contractor shall conform to ACI 306R when mixing and placing concrete during cold weather. Provide sufficient protection when daily temperatures drop below 40 degrees F.
- D. The Contractor shall conform to ACI 305R when mixing and placing concrete during hot weather. When air temperature exceeds 100 degrees F adjust concrete mix with retarding admixture in design mix, and adequately test and take additional measures as directed by concrete supplier.
- E. The Contractor shall maintain access for vehicular and pedestrian traffic as required for other construction activities. Use temporary striping, flagmen, barricades, warning signs, and warning lights as required.
- F. Placing in hot weather: Comply with ACI 305R. Concrete shall be delivered, placed and finished in a sufficiently short period of time to avoid surface dry checking.
 - 1. Concrete shall not exceed 85 degrees F at time of placement.
 - 2. Concrete shall be kept wet continuously after tempering until implementation of curing compound procedure in accordance with this specification.
 - 3. Evaporation Retarder: Apply evaporation retarder to concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 pounds per square foot per hour, before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.
- G. Placing in Cold Weather: Comply with ACI 306R. Protect from frost or freezing. No antifreeze admixtures are permitted.
 - 1. When placing concrete during freezing or near-freezing weather, mix shall have temperature of at least 50 degrees F but not more than 90 degrees F.
 - 2. Concrete shall be maintained at temperature of at least 50 degrees F for not less than 72 hours after placing or until it has thoroughly hardened.
 - 3. Provide necessary thermal coverings for any flat work exposed to freezing temperatures.

PART 2 - PRODUCTS

2.1 DESIGN AND PERFORMANCE CRITERIA

- A. Contractor shall comply with requirements applicable to this Section for concrete materials, admixtures, bonding materials, curing materials, surface sealers and others as required.
- B. Concrete walking surfaces shall have a coefficient of friction not less than 0.30 and will be subject to testing to verify compliance as specified in Article FIELD QUALITY CONTROL.
 - 1. The coefficient of friction will be measured by California Test 342 before pavement is opened to public traffic, but not sooner than 7 days after concrete placement.

2. Contractor shall notify the Architect and Project Inspector of pavement having a coefficient of friction less than 0.30.
- C. Sustainable Design:
1. VOC emissions for field-applied adhesives, sealants, and sealant primers must comply with limits specified in Section 01 6116.
 2. VOC emissions for field-applied paints and coatings must comply with limits specified in Section 01 6116.

2.2 FORMING MATERIALS

- A. Form Material: Steel, wood, or other suitable material of size and strength to resist movement during concrete placement and to retain horizontal and vertical alignment until removal. Use straight forms, free of distortion and defects. Use flexible spring steel forms or laminated boards to form radius bends as required. The forms shall be of a depth equal to the depth of curbing or sidewalk, and so designed as to permit secure fastening together at the tops. Coat forms with non-staining type coating that will not discolor or deface surface of concrete.
1. Concrete Exposed to View: 5/8-inch minimum APA B-B Plyform, steel or "Sonotube" forms by Sunoco, 888-875-8754, or equal.
 2. Concrete Concealed from View: 5/8-inch minimum APA B-B Plyform, steel or 1 x 8 DF, Number 2 Grade or better.
- B. Form Ties: Snap off metal of fixed length, leaving no metal within 1-1/2 inches of surface and no fractures, spalls or other surface defects larger than 1 inch diameter; manufactured by Burke, Dayton Superior, or equal.
- C. Spreaders: Metal. Wood is not permitted.
- D. Form Coating: Coat forms with non-staining material that will not discolor or deface surface of concrete or leave any residue on concrete that would interfere with surface coating as approved by the Architect.
- E. Chamfer Strips: Rigid polyvinyl chloride, 3/4-inch x 3/4-inch, in maximum possible lengths, manufactured by Burke, Greenstreak, Vulco, or equal.

2.3 REINFORCING MATERIALS

- A. Reinforcement Bars: New billet steel deformed bars conforming to requirements of ASTM A615/A615M or ASTM A706/A706M; Grade 60.
1. Bars for dowels installed through expansion joints or construction joints to existing sidewalks or concrete features shall be smooth or if deformed shall be sleeved on one end for slippage.
- B. Reinforcing Supports: Galvanized metal chairs or spacers or metal hangers, accurately placed 3 feet on center each way, staggered, with each support securely fastened to steel reinforcement in place.

1. Bottom bars in footings may be supported with 3-inch concrete blocks with embedded wire ties.
2. Concrete supports without wire ties will not be allowed.

2.4 CONCRETE MATERIALS

- A. Cement: Portland cement in accordance with ASTM C150/C150M, Type II, low alkali.
- B. Concrete Aggregates: Graded from coarse to fine in accordance with ASTM C33/C33M.
 1. Normal Weight Aggregates: Clean and free from deleterious coatings, clay balls, roots, and other extraneous materials, and in conformance with ASTM C33/C33M, except as otherwise specified. Combined grading shall meet limits of ASTM C33/C33M.
 - a. Size: Not be larger than one-fifth of the narrowest dimension between forms, or larger than three-fourths of the minimum clear spacing between reinforcing bars.
 2. Lightweight Aggregates:
 - a. General: Durable particles suitably processed, washed and screened without adherent coatings, free of materials with deleterious reactivity to alkali in cement, and conforming to ASTM C330/C330M.
 - b. Fine aggregate shall be natural sand, or sand prepared from stone or gravel, with grains free of silt, loam and clay.
- C. Water: Potable, clean, and in accordance with ASTM C94/C94M, free from injurious amounts of oil, acids, alkalis, salts, scale, organic materials or other deleterious matter, and in compliance with ACI 318 Section 26.4.1.3.
- D. Fly Ash: Western Fly Ash, conforming to ASTM C618 for Class N or Class F materials and in accordance with CBC Section 1903A.6.
 1. Class C is not permitted.
 2. Proportions: Not more than 15 percent (by weight) may be substituted for portland cement.

2.5 ADMIXTURES

- A. Water Reducing Admixture: Admixture to improve placing, reduce water cement ratio and ultimate shrinkage; "WRDA 64" by GCP Applied Technologies, or equal conforming to ASTM C494/C494M and ACI 318 Section 3.6.
 1. Water reducing admixture may be used subject to prior approval by the Architect, Engineer, and the Testing Lab.
 2. Proposed product and quantity shall be included in original design mix.
- B. Air-Entraining Admixture: "Daravair 1000" by GCP Applied Technologies or equal conforming to ASTM C260 and ACI 318, section 26.4.1.4.
 1. Proportion air entraining concrete to attain specified minimum 28-day compressive strength.

2. Total air entrainment in concrete shall be not less than 4 percent or more than 6 percent of the volume of concrete.
- C. Glare Reduction Colorant: Concentrated pigment dispersions designed to permanently color concrete; "Chromix L10 Base-Black" by Sika Corporation, or equal. *Was within 2.2 H.1*

2.6 CURING MATERIALS

- A. Clear Curing Compound: Water-based membrane-forming concrete curing compound in accordance with ASTM C309 and C1315; "Aqua Resin Cure Clear" by Burke CO, "1100" by W.R. Meadows, or equal.

2.7 ADDITIONAL MATERIALS AND COMPONENTS

- A. Concrete Bonding Agent: The following, or equal, conforming to ASTM C1059/C1059M.
 1. "Weld-Crete" by Larson Products Corporation, 800-633-6668.
 2. "Daraweld C" by GCP Applied Technologies, 877-423-6491.
- B. Patching Mortar: One-component, trowel applied, migrating-corrosion-inhibitor enhanced, polymer-modified, shrinkage-compensated, fiber reinforced, micro-silica enhanced, cementitious repair mortar for horizontal, vertical, and overhead applications; "Meadow-Crete GPS" by W.R. Meadows, or equal.
- C. Non-Shrink Grout: Premixed, non-metallic, no chlorides, non-staining and non-shrinking conforming to ASTM C1107/C1107M; "MasterFlow 713" by Master Builders Solutions, a division of BASF, 800-433-9517, or equal.
- D. Drainage Rock Base: 3/4-inch aggregate size conforming to Class 2 Aggregate Base as defined in Caltrans Standard Specifications Section 26, or equal clean free-draining gravel or crushed rock as recommended by the Geotechnical Engineer.
- E. Expansion Joint Material: Preformed 3/8-inch fiber material, with bituminous binder manufactured for use as concrete expansion joint material and conforming to ASTM D1751 and approved by Architect.
 1. Furnish joint fillers in one-piece lengths for full width being placed, wherever possible. Where more than one length is required, lace or clip joint-filler sections together.
- F. Joint Sealant for Expansion Joints in Concrete: Weather and UV resistant, single component, cold applied silicone sealant, Type S, conforming to ASTM D5893/D5893M; ASTM C920, Grade P, Class 25, Use T.
 1. Self-Leveling: "DOWSIL 890-SL Silicone Joint Sealant" by Dow Chemical Company, or equal.
 2. At Slopes Exceeding 5 Percent: Non-sagging; "DOWSIL 888 Silicone Joint Sealant" by Dow Chemical Company, or equal.
 3. Color: As standard with manufacturer.

- G. Pre-Formed Plastic Expansion Joint Caps: Polystyrene, with removable tops; "Snap Cap" by W. R. Meadows, Tex-Trude expansion caps, or equal.
- H. Truncated Domes: Vitriified Polymer Composite (VPC) cast-in-place detectable/tactile warning surface tiles complying with Americans with Disabilities Act (ADA) and the California Code of Regulations (CCR) Title 24, Part 2, Chapter 11B; "Armor-Tile", "Access Tile Tactile Systems," or equal.
 - 1. Color: Shall be yellow and approximate 33538 of GSA/SAE AMS-STD-595A in accordance with CBC Section 11B-705.1.1.3.1.
- I. Traffic Paint for Accessibility Striping at Stairs: VOC compliant, water-based, vinyl acrylic copolymer fast drying emulsion and specifically formulated as a traffic marking paint; "Setfast" with "Duckback" abrasive additive by Sherwin-Williams, "SAFE-STRIDE" by Wooster Products, Inc., or equal.
 - 1. Colors: As selected by Architect. [Yellow]
- J. Cast Abrasive Accessibility Strips and Stairs: Extruded aluminum with integral anchor and filled with abrasive granules in epoxy binder; Model ST-SF-N by Nystrom, Inc., 800-547-2635, Type T-24 by American Safety Tread Company, Inc., 800-245-4881, Type WP-24A by Wooster Products, Inc., 330-264-2844, or equal.
 - 1. Colors: As selected by Architect. [Yellow]

2.8 CONCRETE DESIGN AND CLASS

- A. Designed Strength and Classes of Concrete: The following mixes are not applicable to concrete items exceeding 4 feet in height above the adjacent grade.
 - 1. Class "B": Concrete shall have 1 inch maximum size aggregate, shall have 3000 pounds per square inch minimum at 28 day strength with a maximum water to cementitious ratio no greater than 0.50.
 - a. Location of Use: Exterior slabs, including walks, vehicular paved surfaces, manhole bases, poured-in-place drop inlets, curbs, valley gutters, curb and gutter, and other concrete of like nature.
 - 2. Class "D" concrete of 1 inch maximum size aggregate shall have 3500 pounds per square inch 28 day strength with a maximum water to cementitious materials ratio of 0.55.
 - a. Location of Use: Footings and retaining walls not attached to buildings, and planter walls, monument signs, and other site concrete not described for use in Class "B".
- B. Slump Limits: Provide concrete, at point of final discharge of proper consistency as tested in accordance with ASTM C143/C143M with slumps of 4 inches, plus or minus 1 inch.
- C. Mix Design: Concrete shall be designed for strength in accordance with provisions of CBC Section 1905A.

1. Should the Contractor desire to pump concrete, a modified mix design will need to be submitted for review.
 2. Fly ash may be used in concrete to improve workability in amounts up to 15 percent of the total cementitious weight.
- D. Air Entrainment: Provide at concrete paving / flatwork, including concrete ramps and stairs in accordance with local jurisdiction minimum requirements, but no less than 3 percent of the volume of concrete.
- E. Glare Reduction Additive:
1. General:
 - a. Provide at exterior concrete slabs, walks, ramps, stairs, including bleachers, and other exposed flatwork to eliminate glare.
 - b. Omit glare reduction colorant where color hardener, integral color, and stain treatment of concrete are scheduled.
 2. Quantity: As required to match approved sample but not exceed 2 pounds of colorant per cubic yard of concrete.
 3. Add colorant to mix in accordance with manufacturer's printed instructions.
- F. Coloring Agent:
1. Quantity: Add pigment as required to result in hardened concrete color consistent with approved sample but not exceeding maximum dosage per sack of cement as recommended by manufacturer based on total cementitious materials of mix design.
 2. Add pre-mixed colorant bags to mix in accordance with manufacturer's printed instructions.

2.9 MIXING OF CONCRETE

- A. Conform to requirements of CBC Chapter 19A.
- B. Concrete shall be mixed until there is uniform distribution of material and mass is uniform and homogenous; mixer must be discharged completely before the mixer is recharged.
- C. Concrete shall be Ready-Mixed Concrete: Mix and deliver in accordance with the requirements set forth in ASTM C94/C94M and ACI 301. Batch Plant inspection may be waived in accordance with CBC Section 1705A.3.3, when approved by the Project Engineer and DSA.
1. Furnish batch certificates for each batch discharged and used in the work.
 2. Approved Testing Laboratory shall check the first batching at the start of the work and furnish mix proportions to the Licensed Weighmaster.
 3. Licensed Weighmaster shall identify materials as to quantity and to certify to each load by ticket.
 4. Delivery tickets are to accompany each truck and shall be kept in the job superintendent's file. Delivery tickets must indicate the following information or be subject to rejection:

- a. Name of Project.
 - b. Supplier of concrete.
 - c. Truck identity and ticket serial number.
 - d. Date of delivery.
 - e. Brand of cement.
 - f. Cement content.
 - g. Strength classification.
 - h. Batching time.
 - i. Point of deposit.
 - j. Total amount of water.
 - k. Weight of aggregate.
 - l. Daily temperature.
 - m. Number of cubic yards in load.
 - n. Admixture content.
 - o. Name of Contractor.
 - p. Name of driver.
 - q. Time loaded and first mixing of concrete.
 - r. Reading of revolution counter.
 - s. Color additive.
5. Ticket shall be transmitted to Project Inspector by truck driver with load identified thereon. Project Inspector will not accept load without load ticket identifying mix and will keep daily record of pours, identifying each truck, its load and time of receipt, and will transmit two copies of record to DSA.
 6. At end of project, Weighmaster shall furnish affidavit to DSA on form satisfactory to DSA, certifying that all concrete furnished is in conformance with proportions established by mix designs.
 7. Placement of concrete shall occur as rapidly as possible after batching and in a manner which will assure that the required quality of the concrete is maintained. In no case may concrete be placed more than 90 minutes from batch time.
 - a. When air temperature is between 85 and 90 degrees F, reduce maximum batching to discharge time from 90 minutes to 75 minutes.
 - b. When air temperature is above 90 degrees F, reduce maximum batching to discharge time to 60 minutes.
 8. Water may be added to the mix only if neither the maximum permissible water-cement ratio nor the maximum slump is exceeded.
 - a. The quantity of water used for each batch shall be accurately measured.
 - b. In no case shall more than 10 gallons of water be added to a full 9-yard load, or 1 gallon per yard on remaining concrete within the drum, providing load tag indicates at time of mixing at plant an allowance for additional water.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Confirm general layout, grade, and joint pattern layout with the Architect prior to placing concrete.
- B. Verify that gradients and elevations of the base are correct, and that the base is dry.
- C. Contractor shall report in writing to the Architect prevailing conditions that will adversely affect satisfactory execution of the work of this Section.
 - 1. Do not proceed with work until unsatisfactory conditions have been corrected.
- D. Forms and reinforcements are subject to approval by the Project Inspector as specified in Article FIELD QUALITY CONTROL.

3.2 PREPARATION

- A. Remove frost, water, and other foreign materials from form surfaces, reinforcement, and embedded items against which concrete will be placed.
- B. When the ambient temperature necessitates the use of cold or hot weather concreting, make provisions in advance of concrete placement.
- C. Before placing concrete, clean tools and equipment, and remove debris from areas to receive concrete.
- D. Clean reinforcing and other embedded items of coatings, oil, mud and soil that may impair bond with concrete.
- E. Slab-On-Grade: After subgrade has been approved by Geotechnical Engineer, install specified drainage rock base material to thickness shown. Rock base shall be implemented and compacted in accordance with the Geotechnical Report and recommendations of the Geotechnical Engineer.

3.3 INSTALLATION – FORMWORK

- A. Form material shall be straight, true, sound and able to withstand deformation due to loading and effects of moist curing. Materials which have warped or delaminated, or require more than minor patching of contact surfaces, shall not be reused.
- B. Build forms to shapes, lines, grades and dimensions indicated. Construct formwork to maintain tolerances required by ACI 301. Forms shall be substantial, tight to prevent leakage of concrete, and properly braced and tied together to maintain position and shape. Butt joints tightly and locate on solid backing. Chamfer corners where indicated. Form bevels, grooves and recesses to neat, straight lines. Construct forms for easy removal without hammering, wedging or prying against concrete.
- C. Space clamps, ties, hangers and other form accessories so that working capacities are not exceeded by loads imposed from concrete or concreting operations.

- D. Build openings into vertical forms at regular intervals if necessary to facilitate concrete placement, and at bottoms of forms to permit cleaning and inspection.
- E. Build in securely braced temporary bulkheads, keyed as required, at planned locations of construction joints.
- F. Before placement of reinforcing steel, coat faces of all forms to prevent absorption of moisture from concrete and to facilitate removal of forms. Apply specified material in conformance with manufacturer's written directions.
 - 1. Seal all cut edges.
 - 2. Before re-using form material, inspect, clean thoroughly, and recoat.
- G. Slope tie-wires downward to outside of wall.
- H. Brace, anchor and support all cast-in items to prevent displacement or distortion.
- I. During and immediately after concrete placing, tighten forms, posts and shores. Readjust to maintain grades, levels and camber.
- J. Concrete Paving, Curbs, Curb and Gutters, Ramps:
 - 1. Expansion Joints: Install at locations indicated, and so that maximum distance between joints is 20 feet for exterior concrete unless otherwise shown. Expansion joint material shall be full depth of concrete section. Recess for snap cap and sealant when required.
 - 2. Curbs, Valley Gutter, and Curb & Gutter: Install expansion joints at 60 feet on center, except when placing adjacent to concrete walks, the expansion joints shall align with the expansion joints shown for the concrete walks. Expansion joint material shall be full depth of concrete section. Recess for snap cap and sealant when required.
 - 3. Isolation Joints: 3/8-inch felt between walls and exterior slabs or walks so that paved areas are isolated from all vertical features, unless specifically noted otherwise on plans.
 - 4. Exterior Concrete Paving: Install expansion joints at 20 feet on center maximum, both directions, unless shown otherwise on plans.
 - 5. Ramps: Whether shown or not, all ramps shall have control joints and expansion joints.
 - a. Control joints on ramps shall be aligned and placed in between the vertical posts for the handrails. The curbs, if required shall have control joints that align with the handrail posts.
 - b. Expansion joints shall be placed at the upper, intermediate, and bottom landings.
- K. Inspection: Refer to Article FIELD QUALITY CONTROL.

3.4 INSTALLATION – REINFORCING

- A. General: Reinforcing shall be accurately placed at locations indicated on the drawings within required tolerances and providing required clearances. Reinforcement shall be

secured prior to placement of concrete such that tolerances and clearances are maintained. Coverage shall be in accordance with Section 1907A.7 of the CBC.

1. Reinforcement must be in place before concreting is begun.
 2. Keep a person on the job to maintain position of reinforcing as concrete is placed.
 3. All expansion and construction joints in concrete shall have dowels of size and spacing as shown on the Drawings, or as approved by Architect.
 4. Give notice whenever pipes, conduits, sleeves, and other construction interferes with placement; obtain method of procedure to resolve interferences.
- B. Additional reinforcing steel shall be placed around all utility boxes, valve boxes, manhole frames and covers that are located within the concrete placements.
1. The bars shall be placed so that there will be a minimum of 1-1/2-inch clearance and a maximum of 3-inch clearance. The reinforcing steel shall be placed mid-depth of concrete slab.
- C. At right angles or intersections of concrete walks, additional 2 feet x 2 feet #5, 90 degree bars shall be added at all inside corners for additional crack control. The bars shall be placed 2 inches from concrete forms and supports, at mid-depth of slab.
- D. Reinforcing steel shall be adequately supported by approved devices on centers close enough to prevent any sagging.
- E. Placing Tolerances:
1. In accordance with ACI 301 or CRSI/WCRSI Recommended Practice for Placing Reinforcing Bars, unless otherwise shown.
 2. Clear distance between parallel bars in a layer shall be no less than 1 inch, the maximum bar diameter shall not exceed 1-1/2 times the maximum size of coarse aggregate.
- F. Splices:
1. General: Unless otherwise shown on drawings, splice top reinforcing at midspan between supports, splice bottom reinforcing at supports, and stagger splices. Bar laps shall be wired together. Reinforcing steel laps shall be as follows:
 - a. Length of Lap Splices in Concrete:
 - 1) No. 4 bar: 24 inches minimum.
 - 2) No. 5 Bar: Not less than 62 bar diameters.
 - 3) No. 6 Bar: 56 inches minimum.
 - 4) No. 7 Bars and Larger: Not less than 93 bar diameters.
 - b. All splices shall be staggered at 5 feet minimum from adjacent splices.
- G. Inspection: Refer to Article FIELD QUALITY CONTROL.

3.5 PLACING OF CONCRETE – GENERAL

- A. Adjacent finish surfaces shall be protected at all times during the concrete pour and finishing. Verify that all formwork is tight and leak-proof before concrete is poured. Finish work defaced during the concrete pour and finishing shall be replaced at no extra cost to Owner.
- B. Remove wood chips, sawdust, dirt, loose concrete and other debris just before concrete is to be poured. Use compressed air for inaccessible areas. Remove all standing water from excavations.
- C. Transport concrete from mixer to place of final deposit as rapidly as practicable by methods which will prevent separation or loss of ingredients. Deposit as close as practicable in final position to avoid re-handling or flowing. Partially hardened concrete must not be deposited in work. Concrete shall not be wheeled directly on top of reinforcing steel.
- D. Keep excavations free of standing water, but moisture condition sub-grade before concrete placement.
- E. Placing: Once started, continue concrete pour continuously until section is complete between predetermined construction joints. Prevent splashing of concrete onto adjacent forms or reinforcement and remove such accumulation of hardened or partially hardened concrete from forms or reinforcement before work proceeds in that area. Free fall of concrete shall not to exceed 4'-0" in height. If necessary, provide lower openings in forms to inject concrete and to reduce fall height.
- F. Remove form spreaders as placing of concrete progresses.
- G. Place footings as monolithic and in one continuous pour.
- H. Compacting: Concrete shall be compacted by mechanical vibrators.
 - 1. Concrete shall be thoroughly worked around reinforcement and embedded fixtures and into corners of forms.
 - 2. Vibrating shall not be applied to concrete which has already begun to initially set or be continued so long as to cause segregation of materials.

3.6 REMOVAL OF FORMS

- A. Remove without damage to concrete surfaces.
 - 1. Sequence and timing of form removal shall insure complete safety of concrete structure.
 - 2. Forms shall remain in place for not less than the following periods of time. These periods represent cumulative number of days during which temperature of air in contact with concrete is 60 degrees F and above.
 - a. Vertical Forms of Foundations, Walls and All Other Forms Not Covered Below: 5 days.
 - b. Concrete Paving Edge Screeds or Forms: 7 days.

3. Concrete shall not be subjected to superimposed loads (structure or construction equipment) until it has attained its full design strength and not for a period of at least 21 days after placing. Concrete systems shall not be subjected to construction loads in excess of design loads.
- B. Patching: Install specified patching mortar per manufacturer's recommendations. Repairs to defective concrete which affect the strength of any structural concrete member or component are subject to approval by the architect and DSA.

3.7 CONCRETE PAVING

- A. Concrete paving shall be formed and finished to required line and grades true and flat with a maximum tolerance of 1/8-inch in 10 feet for flatness and to slopes indicated.
- B. Concrete vibrator shall be used to assist concrete placement. Contractor shall have spare concrete vibrator on site during concrete placement.
- C. Thoroughly water and soak the subgrade of exterior concrete paving, curbs, curb and gutters, with multiple daily waterings for at least three days or as required to achieve required moisture content prior to the concrete pour in order to place the subgrade soils in full expansion.
 1. Provide damming as required to keep standing water within the formed area and to allow for proper saturation and full expansion of the subgrade soils.
 2. Remove standing water before concrete placement.
- D. Construction Joints:
 1. Keep exposed concrete face of construction joints continuously moist from time of initial set until placing of concrete; thoroughly clean contact surface by chipping entire surface not earlier than 5 days after initial pour to expose clean hard aggregate solidly embedded, or by approved method that will assure equal bond, such as green cutting.
 2. If contact surface becomes contaminated with soil, sawdust or other foreign matter, clean entire surface and re-chip entire surface to assure proper adhesion.

3.8 FINISHING

- A. Concrete Paving: Finish surface as required by ACI 302.1R using manual and vibrating screeds to place concrete level and smooth.
 1. Under no circumstances shall water be added to the top surface of freshly placed concrete.
 2. Use "jitterbugs" or other special tools designed for the purpose of forcing the course aggregate below the surface leaving a thick layer of mortar 1 inch in thickness.
 3. After tamping the concrete, wood float surface to a true and even plane.
 4. After floating with a wood bull float, make 2 passes with a steel Fresno trowel to start sealing the concrete surface.

5. While concrete is still wet but sufficiently hardened to bear a persons' weight on knee boards, start troweling with a steel hand trowel or a machine trowel in larger areas. Use sufficient pressure to bring moisture to surface.
 6. After surface moisture has disappeared, finish concrete utilizing steel, hand or power trowel.
 7. Completed surface shall be free from trowel marks, depressions, ridges or other blemishes. Tolerance for flatness shall be 1/8-inch in 10 feet.
 8. Provide final finish as follows, unless otherwise indicated:
 - a. Medium Broom Finish: Typical finish to be used at all exterior walks, stairs and ramps. Brooming direction shall run perpendicular to slope to form non-slip surface.
- B. Curb Finish: Steel trowel.
- C. Joints and Edges:
1. Mark-off exposed joints, where indicated, with 1/4-inch radius x 1 inch deep jointer or edging tool. Joints shall be clean, cut straight and parallel or square with respect to concrete walk edge.
 2. Tool edges of control joints, walk edges, and wherever concrete walk adjoins other material or vertical surfaces. Expansion joints shall be constructed as detailed on plans.
 3. The expansion joints shall be full depth as shown in the Drawings. Failure to do so will result in non-compliance and shall be immediately machine cut by the Contractor at its expense.

3.9 CURING

- A. Formed Concrete:
1. Keep forms and top on concrete between forms continuously wet until removal of forms, 7 days minimum.
 2. Maintain exposed concrete in a continuous wet condition for 14 days following removal of forms.
- B. Concrete Paving, Curb, Curb and Gutter, Valley Gutter:
1. Cure utilizing curing compound. If applicable, the Contractor shall verify that the approved curing compound is compatible with the approved colorant system.
 2. Curing compound shall be applied in a wet puddling application. Spotty applications shall be reason for rejection and possibly concrete removal and replacement at the contractor's expense with no compensation from the Owner.
- C. No curing compound shall be applied to areas scheduled to receive resilient track surface including, curbs, ramps, runways, and similar items.

3.10 DEFECTIVE CONCRETE

- A. General:

1. Determination of defective concrete shall be made by the Architect or Engineer whose opinion shall be final in identifying areas to be replaced, repaired or patched.
2. As directed by Architect, cut out and replace defective concrete.
 - a. Defective concrete shall be removed from the site.
 - b. No patching is to be done until surfaces have been examined by Architect and permission to begin patching has been provided.
 - c. Permission to patch an area shall not be considered waiver of right by the Owner to require removal of defective work, if patching does not, in opinion of Architect, satisfactorily restore quality and appearance of surface.
 - d. Remove and replace concrete if repair to an acceptable condition is not feasible.

B. Defective Concrete Is:

1. Concrete that does not match the approved mix design for the given installation type.
2. Concrete not meeting specified 28-day strength.
3. Concrete which contains rock pockets, voids, spalls, transverse cracks, exposed reinforcing, or other such defects which adversely affect strength, durability or appearance.
4. Concrete which is incorrectly formed, out of alignment or not plumb or level, or outside of the maximum tolerance for flatness and slopes indicated.
5. Concrete containing embedded wood or debris.
6. Concrete having large or excessive patched voids which were not completed under Architect's direction.
7. Concrete not containing required embedded items.
8. Concrete with excessive shrinkage, transverse cracking, crazing, curling; or defective finish.
9. Concrete that is unsuitable for placement or has set in truck drum for longer than 90 minutes from the time it was batched.
10. Concrete where expansion joint filler that is not isolating the full depth of the concrete section, and not recessed as required for backer rod and sealant where required.
11. Concrete that is excessively wet or excessively dry and will not meet the minimum or maximum slump required per mix design.
12. Finished concrete with oil stains from equipment use, and or rust spots that cannot be removed.
13. Concrete with control joints (weakened planed joints) that do not meet the required minimum depth shown on the drawings.
14. Concrete not meeting slip-resistance requirements.

C. Flatwork: The Owner reserves the right to survey the flatwork, to determine if flatwork is outside of the maximum tolerance for flatness and slopes as indicated.

1. If the flatwork is found to be out of tolerance, then the Contractor is required to replace concrete at no additional expense to the Owner.
2. Determination of flatwork flatness, surveying and remedial work must be completed far enough in advance so that the project schedule is maintained, delays are avoided, and the new flatwork or flatwork repairs are properly cured.
3. The Contractor will be responsible for reimbursing the Owner for costs associated with re-surveying to verify compliance of work remediated by the Contractor.

3.11 SEALANT

- A. Apply sealant in compliance with manufacturer's instructions, using hand guns or pressure equipment with proper nozzle size, on clean, dry, properly prepared substrates.
- B. Force sealants into joint against sides of joint to make uniform. Avoid pulling of the sealant from the sides. Fill sealant space completely with sealant.
- C. Finished joints shall be straight, uniform, smooth, and neatly finished.
- D. Remove any excess sealant from adjacent surfaces of joints utilizing the manufacturer's recommended solvent and cleaning processes. Leave the work in a neat, clean condition.

3.12 FIELD QUALITY CONTROL

- A. Inspection of Forms and Reinforcing:
 1. Approval of forms and reinforcing steel must be received from Project Inspector prior to pouring concrete.
 2. Notice of readiness to place first pour shall be given to Project Inspector, DSA, Architect, and Engineer not less than 48 hours prior to placement of concrete to allow for inspection.
 3. Pouring of concrete shall not proceed prior to completing requested adjustments to forms and reinforcing and without approval of Project Inspector.
- B. Testing of Concrete:
 1. Frequency and Samples for Testing:
 - a. Four identical cylinder samples for strength tests of each class of concrete placed each day shall be taken not less than once a day, or not less than once for each 50 cubic yards of concrete, or not less than once for each 2,000 square feet of surface area for slabs or walls.
 - b. In addition, samples for strength tests for each class of concrete shall be taken for seven-day tests at the beginning of the concrete work or whenever the mix or aggregate is changed.
 2. Testing:
 - a. Slump: Each truck's concrete shall be tested for slump before concrete is placed.
 - b. Strength:

- 1) Tests for strength will be conducted by Testing Agency on one cylinder at 7 days and two cylinders at 28 days. The fourth remaining cylinder will be available for testing at 56 days if the 28-day cylinder test results do not meet the required design strength.
 - 2) On a given project, if the total volume of concrete is such that the frequency of specified testing would provide less than five strength tests for a given class of concrete, tests shall be made from at least five randomly selected batches or from each batch if fewer than five batches are used.
- C. Slip-Resistance Testing: Owner's Testing Agency will perform testing on flatwork to verify compliance with specified slip-resistance.
1. The coefficient of friction will be measured by California Test 342 before pavement is opened to public traffic, but not sooner than 7 days after concrete placement
 2. Where paving is determined to have a coefficient of friction less than 0.30, Contractor is to repair and/or replace these surfaces at no cost to Owner.

3.13 CLEANING

- A. Upon completion of work of this Section promptly remove from the working area all scraps, debris and surplus material of this Section.
- B. Clean excess material from surface of all concrete walks and utility structures.
- C. Power wash concrete surfaces to remove stains, dried mud, tire marks, and rust spots.
- D. Comply with any additional requirements of additive manufacturer for colored concrete.

3.14 PROTECTION

- A. Graffiti-resistant Coating:
 1. Surface Preparation: Prepare concrete surface to receive graffiti-resistant coating specified in Section 09 9623, Graffiti-Resistant Coatings, where indicated.
 2. Concrete must be clean, dry, and free of efflorescence and dust.
- B. Protect work and materials of this Section prior to and during installation, and protect the installed work and materials of other trades.
- C. In the event of damage during construction, make all repairs and replacements necessary to the approval of the Architect, at no additional cost to the Owner.

END OF SECTION

PART 1 – GENERAL

1.1 SUMMARY

- A. Provide all labor, materials, equipment, and tools necessary for the complete installation of an attenuated synthetic grass infill system as outlined in these specifications. The system should consist of but not necessarily be limited to the following:
- B. A vertical draining field base consisting of a four-inch layer of compacted $\frac{3}{4}$ " Class 2 aggregate compacted to 95% and four-inch layer of Class 2 permeable base compacted to 90-95% relative compaction.
- C. A complete synthetic grass system, consisting of:
 - 1. Synthetic turf
 - 2. Cushion layer
 - 3. An infill system, consisting of a specially formulated non-expansive, coated, clean, dust free and specially sized silicon dioxide bead (Envirofill brand preferred).
- D. Quality Assurance: Manufacturer should have manufactured and installed synthetic grass surfaces for a minimum of 5 years. Manufacturer's detailed installation procedures should be submitted to the Architect and made part of the Bid Specifications.

1.2 RELATED REQUIREMENTS

- A. Section 01 5000, Temporary Facilities and Controls.
- B. Section 31 0000, Earthwork.
- C. Section 33 4000, Storm Drainage Utilities.

1.3 REREENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. ASTM D624 Standard Test Method for Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomers.
- C. ASTM D2859 Standard Test Method for Flammability of Finished Textile Floor Covering Materials
- D. ASTM E303 Standard Test Method for Measuring Surface Frictional Properties Using the British Pendulum Tester
- E. ASTM F1292 Standard Specification for Impact Attenuation of Surface Systems Under

and Around Playground Equipment

- F. ASTM F1951 Standard Specification for Determination of Accessibility of Surface Systems Under and Around Playground Equipment
- G. ASTM C1028 Standard Test Method for Determining the Static Coefficient of Friction of Ceramic Tile and Other Like Surfaces by the Horizontal Dynamometer Pull Meter Method – This standard replaces ASTM D2047
- H. ASTM D412 Standard Test Methods for Vulcanized Rubber and Thermoplastic Rubbers and Thermoplastic Elastomers- Tension

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Submittal Procedures:
 - 1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
 - 2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
 - 3. Sustainable Design Submittals shall comply with the additional requirements of Section 01 8113, Sustainable Design Requirements.
- B. Coordination:
 - 1. General Contractor shall coordinate work as herein specified, in accordance with drawings and as required to complete scope of work with all related trades.

1.5 ACTION SUBMITTALS

- A. Provide supplier's descriptive literature for all products to demonstrate compliance with specified attributes:

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For contractor / Installer.
Prospective manufacturers and/or installers of the turf should be required to comply with the following:
 - I. The turf manufacturer must be experienced in the manufacture of a no nail synthetic grass system and provide references of five (5) specific installations in the last three (3) years.
 - J. The turf installer must provide competent workmen skilled in no nail synthetic grass installation. The designated supervisory personnel on the project must be competent in the installation of this material, including gluing seams and proper installation of the infill mixture.
 - K. Installation should be in accordance with ASTM F1292 for Impact Attenuation of surface system under and around playground equipment. The poured in place system to be installed in compliance with the Critical Fall Height as determined by the Playground

Equipment (if any).

- L. Manufacturers should provide written instructions for recommended maintenance practices.

1.7 CLOSEOUT SUBMITTALS

- A. Guarantee: Submit subcontractor's guarantee.

1.8 QUALITY ASSURANCE

- A. Contractor / Installer shall have been in business for five (5) years providing/finishing similar size projects and complexity.
- B. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.
- C. All materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.

1.9 DELIVERY, STORAGE AND HANDLING

- A. Transport, store and handle in strict accord with the local jurisdiction.

1.10 FIELD CONDITIONS

- A. Contractor shall acquaint himself with all existing site conditions. If unknown active utilities are encountered during work, notify Architect promptly for instructions. Failure to notify will make Contractor liable for damage to these utilities arising from Contractor's operations subsequent to discovery of such unknown active utilities.
- B. Trench dewatering may be necessary. Contractor shall provide any and all tools, equipment and labor necessary for trench dewatering no matter what the source. Dewatering shall be continuous until all site utilities are installed and backfilled.

1.11 PROTECTION

- A. Adequate protection measures shall be provided to protect workers and passers-by on and off the site. Adjacent property shall be fully protected throughout the operations. Blasting will not be permitted. Prevent damage to adjoining improvements and properties both above and below grade. Restore such improvements to original condition should damage occur. Replace trees and shrubs outside building area disturbed by operations. Repair all trenches in grass areas with new sod (seeding not permitted) and "stake-off" for protection.
- B. Contractor shall be solely and completely responsible for working conditions at the job site, including safety of all persons and property during performance of the work. This requirement shall apply continuously and shall not be limited to normal working hours.
- C. Any construction review of the Contractor's performance conducted by the Architect or Owner is not intended to include review of the adequacy of the Contractor's safety measures, in, on or near the construction site.

SYNTHETIC TURF
SECTION 32 1816.16
3595001

- D. Provide shoring, sheeting, sheet piles and or bracing to prevent caving, erosion or gullyng of sides of excavation.
- E. Surface Drainage: Provide for surface drainage during period of construction in manner to avoid creating nuisance to adjacent areas. Keep all excavations free from water during entire progress of work, regardless of cause, source or nature of water.
- F. Adjacent streets and sidewalks shall be kept free of mud, dirt or similar nuisances resulting from earthwork operations.
- G. The site and adjacent influenced areas shall be watered as required to suppress dust nuisance.
- H. Trees: Carefully protect existing trees which are to remain.

1.12 TRENCH SAFETY PROVISIONS

- A. General Contractor shall be solely responsible for safety design, construction and coordination with agencies having jurisdiction. If such plan varies from shoring system standards established by Construction Safety Orders, plan shall be prepared by registered civil or structural engineer.
- B. Nothing herein shall be deemed to allow use of shoring, sloping or protective system less effective than that required by Construction Safety Orders of California State Division of Industrial Safety.
- C. When trenching through paved surface, provide steel trench plates to cover open trenches daily until trenches are backfilled.

1.13 SEASONAL LIMITS

- A. No backfill material shall be placed, spread or rolled during unfavorable weather conditions. When work is interrupted by heavy rains, full operations shall not be resumed until field tests indicate that moisture content and density of fill are satisfactory.
- B. Material above optimum moisture shall be processed per Section 31 0000, Part 3, Article "Subgrade Preparation".

1.14 TESTING

- A. General: Refer to Section 31 0000, Part 1, Article "Testing" and Part 3, Article "Testing and Observation".

1.15 WARRANTY AND MAINTENANCE

- A. The bidder and/or the turf manufacturer must provide the following:
- B. The turf manufacturer should provide a warranty to the owner that covers defects in materials and workmanship of the turf for a period of **FIVE (5) years** from the date of Substantial Completion, and **TWO (2) years** on seams.
- C. The manufacturer's warranty should specifically exclude vandalism, acts of War and acts of Nature beyond the control of the owner of the manufacturer.

- D. All turf warranties should be limited to repair or replacement of the affected areas and should include all necessary materials, labor, transportation costs, etc. to complete said repairs.
- E. All warranties are contingent upon full payment by the owner of all pertinent invoices and owner, at owner's expense, completing a full power-brooming and "top-off" of lost infill at two-year intervals from date of substantial completion.
- F. The bidder should provide a maintenance program to the owner. The warranty should be subject to compliance with said maintenance program in addition to items named above.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

The synthetic turf material and resilient cushion should be in accordance with the following:

- A. Acceptable Manufacturer: Beyond Grass Premium or Tencate Grass.
- B. Or approved equal.

2.2 SYSTEM REQUIREMENTS

- A. A poured in place system with a synthetic grass wearing layer upper membrane and an underlying impact attenuation cushion layer. The finished surface should be porous and capable of being installed at varying thickness to comply with Critical Fall Height requirements of playground equipment.
- B. The cushion layer should be a mixture of black recycled rubber mixed with a 100% solids moisture cured aromatic Polyurethane binder (100 pounds of rubberized cushion layer to 12 pounds of binder) installed at the appropriate thickness.
- C. Synthetic Turf shall be:
 - 1. A 1-1/2" monofilament polyethylene with brown thatch yarn, formulated for superior wear resistance and a secondary proprietary polyethylene thatch. Product must have built-in antimicrobial protection to inhibit the growth of bacteria, mold, mildew, and reduce odor.
 - 2. The system should be tufted with a minimum of 60 ounce of yarn per square yard. The system should also include a primary woven polypropylene backing and a polyurethane secondary backing. Finish coating shall be at 22 ounces per square yard.
 - 3. The machine gauge shall be 1/2". Tufted pile height is 1-1/2".
 - 4. Total fabric weight shall be at least 88 ounces per square yard.
 - 5. The finished product should also include perforations to ensure drainage greater than 30 inches per hour. Non-perforated systems should not be acceptable alternates for purposes of this specification.

- D. The turf should be delivered in 15' wide rolls.
- E. All lines, numbers and markings indicated on plans should be permanently inlaid. Painted lines should not be an acceptable alternative for purposes of this specification.
- F. The fiber should be green in color to simulate natural grass as closely as possible and treated with UV inhibitor, guaranteed a minimum of eight years.
- G. The infill system should be an a non-expansive engineered coated, clean, dust free and specially sized silicon dioxide beads.
- H. Latex backed turf shall not be acceptable. All adhesives must also be latex free.

PART 3 – EXECUTION

3.1 SITE PREPARATION AND BASE

- A. The sub-base will have a slope per plan.
- B. The base aggregate should consist of a minimum of four inches (4") of $\frac{3}{4}$ " Class 2 aggregate compacted to 95% and four inches (4") of $\frac{3}{4}$ " Class 2 permeable aggregate base compacted to between 90%-95%.
- C. The sub base should be installed in two inch (2") lifts to appropriate thickness.
- D. The sub-base should be compacted using vibrating tamper, to approximately 95% Proctor density.
- E. The sub-base should no longer have any vegetation.
- F. Subgrade prior to aggregate installation: Sublevel grade is to be compacted prior to the ABC aggregate installation. Particular attention should be paid to areas of disturbed earth such as where footers for playground equipment enter the ground. Concrete used to fill said areas/footers should be poured to the top of sublevel surface.
- G. The sub-base installer and architect will accept the aggregate base in writing prior to the installation of the poured in place system.
- H. Any alterations must be agreed between all parties.

3.2 INSTALLATION

The synthetic turf safety surfacing installer should strictly adhere to the installation procedures outlined under these sections. Any variance from these requirements should be accepted in writing by the manufacturer's onsite representative and submitted to the architect/owner, verifying that the changes do not in any way affect the warranty.

A. Cushion Layer

1. The components of the poured in place safety surfacing should be mixed on site in a mixer to ensure a comprehensive mix according to manufacturer's instructions.
2. The cushion layer comprised of SBR buffings shall be mixed with the aromatic moisture cured polyurethane binder at a rate of 12% of the total weight of the material thoroughly so that the binder is evenly dispersed into the rubber base.
3. The cushion layer comprised of non-tire derived SBR & EPDM Chunk Rubber shall be mixed with the appropriate amount of urethane so that the binder is evenly dispersed into the rubber base.
4. The cushion layer mix should then be spread and troweled to the desired depth and allow to cure for 24 hours.

B. Synthetic Turf Layer

1. The synthetic grass should be cut and laid out across the area, and utilizing standard state-of-the-art gluing procedures, each roll should be seamed to the next.
2. The edge of the synthetic turf should be stapled or nailed to header/anchor board.
3. A strip of seam tape should be used to seam the rolls of material. The specified glue should be a one part urethane adhesive (SeamTight).

C. Infill

1. The infill material shall be spread evenly, at a rate of 2 lbs per square foot with a large fertilizer type spreader. The infill will be spread in strict accordance with the turf installer's specifications.
2. Between each application of infill, the field area should be brushed with a motorized rotary nylon broom.
3. Caution: Too much fiber exposed (not enough infill) will cause the fibers to mat or crush with heavy foot traffic. This will lead to premature wearing of the fiber and will void any manufacturer's warranty. No Crumb Rubber shall be used as infill.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Gates and gate hardware.

1.2 RELATED REQUIREMENTS

- A. Section 01 6116, Volatile Organic Compound (VOC) Restrictions, for VOC limits pertaining to adhesives, sealants, fillers, primers, and coatings.
- B. Section 01 8113, Sustainable Design Requirements, for CAL-Green general requirements and procedures.
- C. Section 32 1600, Site Concrete.
- D. Section 08 7100, Door Hardware, for padlocks.

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CAL Green), edition as noted on the drawings, as adopted by the California Division of the State Architect (DSA).
- C. Chain Link Fence Manufacturers' Institute (CLFMI):
 - 1. Products Manual.
- D. ASTM International (ASTM):
 - 1. A153: Zinc Coating (Hot Dip) on Iron and Steel Products.
 - 2. A392: Zinc Coated Steel Chain Link Fence Fabric.
 - 3. A653/A653M: Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
 - 4. A780/A 780M: Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings.
 - 5. C33/C33M: Standard Specification for Concrete Aggregates.
 - 6. C94: Ready-mixed Concrete.
 - 7. C150/C150M: Standard Specification for Portland Cement.
 - 8. F668: Poly Vinyl Chloride (PVC) Coated Steel Chain Link Fence Fabric.
 - 9. F934: Standard Colors for Poly Vinyl Chloride (PVC) Coated Chain Link.
 - 10. F969: Standard Practice for Construction of Chain-Link Tennis Court Fence.
 - 11. F1083: Pipe, Steel, Hot-Dipped Zinc Coated (Galvanized) Welded, for Fence Structures.

CHAIN LINK FENCES AND GATES
SECTION 32 3113
3595001

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Submittal Procedures:
 - 1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
 - 2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
 - 3. Sustainable Design Submittals shall comply with the additional requirement of Section 01 8113, Sustainable Design Requirements.

1.5 ACTION SUBMITTALS

- A. Shop Drawings: Submit showing all parts, connections and anchorages, adjacent materials, fully dimensioned and noted. Indicate plan layout, spacing of components, post foundation dimensions, hardware anchorage and schedule of components.
- B. Products Data: Submit list and complete descriptive data of all products proposed for use. Include manufacturer's specifications, published warranty or guarantee, installation instructions, and maintenance instructions.
- C. Samples:
 - 1. Chain-link fabric, approximately 12 inches square, in selected color.
 - 2. Hardware and fittings if requested by Architect.

1.6 INFORMATIONAL SUBMITTALS

- A. Sample of manufacturer's warranty.
- B. Sustainable Design:
 - 1. General:
 - a. Submit information necessary to establish and document compliance with the California Green Building Standards Code.
 - b. Sustainable design submittals are in addition to other submittals.
 - 2. The following information shall be provided:
 - a. Paints and Coatings: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.

1.7 CLOSEOUT SUBMITTALS

- A. Warranty/Guarantee: Submit executed warranty and Subcontractor's guarantee.

1.8 QUALITY ASSURANCE

- A. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.
- B. Use materials and products of one manufacturer whenever possible.

- C. All materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.

1.9 DELIVERY, STORAGE AND HANDLING

- A. Deliver undamaged products to job in manufacturer's sealed containers and/or original bundles with tags and labels intact.
- B. Store materials in protected, dry conditions off of ground and in areas so as to not interfere with the progress of the work.
- C. Transport, store and handle in strict accord with the manufacturer's written recommendations.

1.10 FIELD CONDITIONS

- A. Make and be responsible for all field dimensions necessary for proper fitting and completion of work. Report discrepancies to Architect before proceeding.

1.11 WARRANTY

- A. Manufacturer: In addition to the Contractor's and Subcontractor's Guarantee, furnish Owner with manufacturer's fully executed written warranty for chain link fencing against defects in materials and workmanship, including the following:
 - 1. Windscreen: 3 years.

PART 2 - PRODUCTS

2.1 DESIGN AND PERFORMANCE CRITERIA

- A. Industry Standards: Materials and installation shall conform to the requirements of the Chain Link Fence Manufacturers Institute (CLFMI) "Product Manual."
- B. Regulatory Requirements: Pedestrian gates and related hardware shall comply with applicable codes, including provisions for accessibility required by CBC and the Americans with Disabilities Act "Designs for Accessible Design." Comply with the most stringent.
- C. Use new components **[except existing fence indicated to be relocated,]** free from defects affecting service and appearance.
- D. Sizes specified or shown are minimum.
- E. Provide ferrous material except as otherwise indicated or specified.
- F. Sustainable Design:
 - 1. VOC emissions for field-applied paints and coatings must comply with limits specified in Section 01 6116.

CHAIN LINK FENCES AND GATES

SECTION 32 3113

3595001

2.2 WORKMANSHIP

- A. Galvanizing: Hot dip galvanize ferrous materials after fabrication. Repair zinc coating damaged in shop or during field erection by re-coating with hot repair compound, Re Galv, Galvalloy, Galvieweld-alloy, or equal, applied in accord with manufacturer's recommendations.

2.3 MATERIALS

- A. Vinyl Coated Chain Link Fabric: Steel wire with no less than 1.20 ounce of zinc coating per square foot of surface area, covered with color coating of polyvinyl chloride no less than 15 mils thick fusion method with breaking strength of 1200 pounds (Class 2b), and complying with ASTM F668.
 - 1. Typical:
 - a. Wire Diameter: 9 gage, coated size.
 - b. Mesh Opening: 2 inches.
 - 2. Edges: Knuckle fabric at bottom and at top selvage.
 - 3. Fabric widths shall be one piece.
 - 4. Color of PVC Coating: In compliance with ASTM F934 and as selected by Architect.
- B. Security Fabric: 16 gauge galvanized sheet metal in conformance with ASTM A653/A653M, 1.3 pounds per square foot, with round hole perforations; McNichols item number 1431141638 as specified and the basis of design, or equal.
 - 1. Perforations shall be 3/16" holes on a 1/4" stagger.
 - 2. Open Area: 51 percent.
 - 3. Finish: Prime and paint as specified in Section 09 9100, Painting, prior to installation.
- C. Security Fabric U-Edging: 14 gauge. galvanized hot rolled U shaped edging, 1 inch tall face x 3/8 inch opening width; McNichols quality U-Edging, item number 4003801410 as specified and the basis of design, or equal.

2.4 GATES

- A. Frames:
 - 1. Gate Leaves to 6 Feet Wide: 1-5/8 inch outside diameter pipe at 2.27 pounds per linear foot.
 - 2. Provide additional horizontal and vertical pipe or tube as necessary to assure proper gate operation and attachment of fabric and hardware.
- B. Diagonal Bracing: Provide adjustable length 3/8 inch truss rods on non-welded gate frames and welded gate frames where corner rigidity is insufficient to insure no sag.
- C. Fabric: As specified for fence.
- D. Gate Assembly:

1. Weld or assemble gate frame with malleable or pressed steel fittings and rivets to provide rigid connections.
 2. Install fabric with stretcher bars at vertical edges, which may also be used at top and bottom edges.
 3. Securely attach stretcher bars and fabric to frame on all sides at 15 inches on center.
 4. Attach hardware with rivets or by other means which will provide security against removal.
- E. Gate Hardware:
1. Provide the following at Accessible gates:
 - a. Exit Device: Von Duprin CD-PA-AX-99-NL-06-WH
 - b. 1 set hinges: self closing Mammoth hinges.
 - c. 1 each: Rim cylinder 20-057 ICX 626 SCH.
 - d. 2 each: FISC core 23-030 626 SCH.
 - e. 1 each: Mortise cylinder 26-091 ICX XQ11-848 626 SCH
- F. Kick Plates: 10 inches tall x width of gate x 14 gauge minimum, smooth uninterrupted surfaced, galvanized steel.
1. Mount on the bottom edge of gate at the push side. Mount on both sides at two-way swing gates.
 2. Bottom edge of plate shall be not more than 3 inches above the top of the walk.
 3. Plate shall be welded to the fence frame and shall allow the gate to be opened by a wheelchair footrest without creating a trap or hazardous condition.
 4. Provide at pedestrian gates that are within the disabled accessible path of travel

2.5 ADDITIONAL MATERIALS AND COMPONENTS

- A. Galvanizing Repair: Zinc coating damaged in shop or during field erection shall be by re-coated using a hot repair compound; "Regalv" repair stick by Rotometals, San Leandro, CA, or equal, applied in accordance with manufacturer's recommendations.

2.6 RELOCATED EXISTING CHAIN LINK FENCING

- A. Inspect existing chain link fencing fabric indicated to be removed and re-installed in new work.
- B. Supervise removal and re-installation.
- C. Provide new material, including fittings and hardware, as necessary for re-installation, complete as specified for new chain link fencing.
- D. Existing fencing materials indicated to be removed or relocated and which are not re-installed in new work, including footing, will become property of the Contractor and shall be removed from the site.

CHAIN LINK FENCES AND GATES
SECTION 32 3113
3595001

PART 3 - EXECUTION

3.1 INSTALLATION

A. General:

1. Execute work in accord with best trade practice for industrial fence installations.
2. Make welds neat and secure, grind off excess exposed metal.
3. Gates shall move freely without sag.

B. Tension Wire: Provide wire at bottom of fence fabric. Install taut, tying to each post with 6 gauge wire.

C. Fabric: Leave about 1-1/2 inches between ground and bottom barbs.

1. Pull fabric taut and tie to posts, rails and tension wires.
2. Install fabric on security side of fence.
3. Fabric shall remain under tension after pulling force is released.

D. Gates:

1. Install gates plumb, level and secure, with full swing or slide without interference.
2. Install ground set items in substantial concrete mass for adequate anchorage.

E. Tie Wires:

1. Install with one tight turn to hold fabric firmly to frame.
2. Bend ends of wire inward to prevent hazard to persons or apparel.

F. Fasteners:

1. Install nuts for tension band and hardware bolts on side of fence opposite fabric side.
2. Spoil ends of bolts to prevent removal of nuts.

3.2 ADJUSTING

A. Repair exposed zinc coatings damaged in shop or during field erection using specified repair system and in compliance with ASTM A 780,

B. Adjust gated hardware for smooth operation and lubricate where necessary.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

A. Scope of Work:

1. Furnish all labor, materials, tools, equipment, and transportation required to perform and complete the installation of an automatic sprinkler irrigation system, including all piping, sprinkler heads, controls, connections, testing, etc. as shown on the Drawings and as specified herein. The water source for this project is potable water.
2. Utilize and accept as standards manufacturer's recommendations and/or installation details for any information not specifically detailed on the Drawings.

1.2 RELATED REQUIREMENTS

- A. Section 01 6116, Volatile Organic Compound (VOC) Restrictions, for VOC limits pertaining to adhesives, sealants, fillers, primers, and coatings.
- B. Section 01 8113, Sustainable Design Requirements, for CAL-Green general requirements and procedures.
- C. Section 31 0000, Earthwork.
- D. Section 31 2333, Trenching and Backfilling.
- E. Section 32 9000, Landscaping.

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CALGreen), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).

1.4 ADMINISTRATIVE REQUIREMENTS

A. Submittal Procedures:

1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
3. Sustainable Design Submittals shall comply with the additional requirements of Section 01 8113, Sustainable Design Requirements

**IRRIGATION
SECTION 32 8000
3595001**

B. Pre-Installation Meeting:

1. Request and hold a pre-installation meeting prior to beginning the work of this Section. Parties required to be in attendance are the Landscape Contractor, Project Inspector, Owner's Representative, and the Landscape Architect.

1.5 ACTION SUBMITTALS

- A. Product names are used as standards; provide proof as to equality of any proposed material and do not use other materials or methods unless approved in writing by the Owner's Representative. Submit no more than one request for substitution for each item. The decision of the Owner's Representative is final.
- B. Use equipment capacities specified herein as the minimum acceptable standards.
- C. List materials in the order in which they appear in Specifications; include substitutions. Submit the list for approval by the Owner's Representative.
- D. Make any mechanical, electrical, or other changes required for installation of any approved, substituted equipment to satisfaction of Owner's Representative and without additional cost to Owner. Approval by Owner's Representative of substituted equipment and/or dimensional drawing does not waive these requirements.
- E. Do not construe approval of material as authorization for any deviations from Specifications unless attention of Owner's Representative has been directed to specified deviations.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data for the following:
 1. For landscape contractor.
- B. Sample of manufacturers' warranty.
- C. Record of Pre-Installation Meeting.
- D. Sustainable Design:
 1. General:
 - a. Submit information necessary to establish and document compliance with the California Green Building Standards Code.
 - b. Sustainable design submittals are in addition to other submittals.
 2. The following information shall be provided:
 - a. Adhesives and Sealants: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.
 - b. Paints and Coatings: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.

1.7 CLOSEOUT SUBMITTALS

- A. Warranty/Guarantee: Submit executed warranty and subcontractor's guarantee.
- B. Maintenance and Operating Instructions:
 - 1. Furnish operating maintenance instructions bound in a hardback binder and indexed. Start compiling data upon approval of list of materials. Do not request final inspection until booklets are approved by Owner's Representative.
 - 2. Incorporate the following information in these sets:
 - a. Complete operating instructions for each item of irrigation equipment.
 - b. Typewritten maintenance instructions for each item of irrigation equipment.
 - c. Manufacturer's bulletins which explain installation, service, replacement parts, and maintenance.
 - d. Service telephone numbers and/or addresses posted in an appropriate place as designated by Owner's Representative.
- C. Record Drawings.

1.8 QUALITY ASSURANCE

- A. Qualifications: Work must be complete by a licensed Landscape Contractor. Provide proof of five years' continuous experience in landscaping and irrigation of projects of similar size.
- B. Certification: Ensure that the contractor installing the Central Control System is trained and certified in the installation of the Central Control System. The training and certification must have been completed within two years prior to the installation date.
- C. Work Force: Ensure that an experienced foreman is present at all times during installation. Keep the same foreman and workers on the job from commencement to completion.
- D. Reviews: Specifically request reviews of all items listed in Article INSPECTION REQUIREMENTS, prior to progressing to the next level of work.
- E. Standards:
 - 1. Provide work and material in full accordance with the rules and regulations of the National Electric Code; the Uniform Plumbing Code; and other applicable state or local laws or regulations.
 - 2. Furnish, without extra charge, additional material and labor required to comply with these rules and regulations, though the work may not be specifically indicated in the Specifications or Drawings.
 - 3. Where the Specification requirements exceed those of the above-mentioned codes and regulations, comply with the requirements in the Specifications.

**IRRIGATION
SECTION 32 8000
3595001**

1.9 DELIVERY, STORAGE AND HANDLING

- A. Transport, store and handle in strict conformance with the manufacturer's written recommendations.
- B. Deliver undamaged products to job in manufacturer's sealed containers and/or original bundles, with tags and labels intact. All material containers or certificates shall be clearly marked by manufacturer as to contents for inspection.
- C. Store materials in original undamaged packages and containers, inside well-ventilated area protected from weather, moisture, soilage, extreme temperatures, and humidity. Lay flat, blocked off ground.
- D. Use all means necessary to protect irrigation system materials before, during, and after installation and to protect related work and material.
- E. Handle plastic pipe carefully, especially protecting it from prolonged exposure to sunlight. Store pipe on beds that are the full length of the pipe, and keep pipe flat.

1.10 FIELD CONDITIONS

- A. Information on Drawings relative to existing conditions is approximate. During progress of construction, make deviations necessary to conform to actual conditions, as approved by Owner's Representative, without additional cost to Owner. Accept responsibility for any damage caused to existing services. Promptly notify Owner's Representative if services are found which are not shown on Drawings.
- B. Protect existing trees-to-remain as specified in "Existing Tree Protection" in Article PREPARATION, in Part 3 of this Section.
- C. Protect existing utilities within construction area. Repair damages to utility lines that occur as a result of operations of this work.
- D. Verify dimensions at building site and check existing conditions before beginning work. Make changes necessary to install work in harmony with other crafts after receiving approval by Owner's Representative.

1.11 INSPECTION REQUIREMENTS

- A. Obtain verification from Project Inspector for the following at the appropriate times during construction and prior to further progression of work in this Section:
 - 1. Pressure testing of all mainlines and lateral lines (See "Hydrostatic Tests – Open Trench" in Article FIELD QUALITY CONTROL, in Part 3 of this Section),
 - 2. Trench depth,
 - 3. Sleeves under pavement,
 - 4. Flushing of all mainlines and lateral lines,
 - 5. Backfill and pipe bedding,

- 6. Layout of heads,
 - 7. Operation of system and coverage adjustments (with Landscape Architect) after system is fully automated and operational, backfill of trenching is completed, and surface has been restored to original grades.
- B. In case of failure to obtain any verification by the Project Inspector as required above, remove and replace work as necessary to obtain the verification at no additional cost to the Owner.

1.12 WARRANTY AND GUARANTEE

- A. Manufacturer: In addition to the Contractor's and Subcontractor's Guarantee, furnish Owner with manufacturer's available fully executed written warranty against defects in materials and workmanship.
- B. Subcontractor Guarantee: Shall include damage by leaks and settlement of irrigation trenches.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Use materials as specified; any deviation from the Specifications must first be approved by the Owner's Representative in writing.

2.2 DESIGN AND PERFORMANCE CRITERIA

- A. Sustainable Design:
 - 1. VOC emissions for field-applied adhesives, sealants, and sealant primers must comply with limits specified in Section 01 6116.
 - 2. VOC emissions for field-applied paints and coatings must comply with limits specified in Section 01 6116.

2.3 MATERIALS

- A. Automatic Control Valves: As indicated on Drawings.
- B. Gate Valve: As indicated on Drawings.
- C. Pipe and Fittings:
 - 1. PVC pipe: As indicated on Drawings.
 - 2. PVC fittings three-inch (3") size and smaller: High impact, standard weight, Schedule 40, molded PVC as manufactured by George Fischer, Lasco, Spears, or approved equal.

IRRIGATION
SECTION 32 8000
3595001

3. PVC fittings four-inch (4") size and larger: High impact, standard weight, Class 200 gasketed, molded PVC as manufactured by George Fischer, Lasco, Spears, or approved equal.
 4. All plastic pipe and fittings: Continuously and permanently marked with manufacturer's name, type of material, IPS size, schedule, NSF approval, and code number.
 5. Threaded PVC pipe and nipples: IPS Schedule 80 when necessary to use threaded connections to gauges, valves, or control valves. Threaded adapters may be used in place of nipples when making pipe to valve connections.
 6. Use 45-degree fittings for changes in depth of pipe, and at transition from main line to automatic control valves.
 7. Piping above ground: Schedule 40 galvanized steel with cast-iron fittings.
- D. PVC Primer: Weld-On P-70 Purple Primer or approved equal.
- E. PVC Glue: Weld-On 711 Gray heavy bodied PVC Cement or approved equal.
- F. Sprinkler Heads: As indicated on Drawings.
- G. Quick Coupler Valves: As indicated on Drawings.
- H. Sleeves: As indicated on Drawings.
- I. All Valve Boxes and Covers: Manufactured, green with "Irrigation – Non-Potable" permanently embossed on cover. Carson, Rainbird or approved equal.
- J. Reduced Pressure Backflow Preventer: As indicated on Drawings.
- K. Automatic Sprinkler Control Wire:
1. Connections between remote control valves and controller: UF-14 direct burial polyethylene (PE) insulated wire, Paige Electric P7079D or approved equal. Common wire to be white, and lead wire to be colored. If multiple controllers are used, a different color is to be used for each controller's lead wire. (Use red for the first controller). Spare wires are to be yellow.
 2. UL Listed waterproof sealing pack for wire connections: 3M DBR/Y-6, or approved equal.
 3. Provide adequate working space around electrical equipment in compliance with local codes and ordinances.
 4. Electrical, other than low voltage, such as power wiring, conduit, fuses, thermal overloads and disconnect switches, is included under Division 26 of these Specifications.
- L. Unions And Flanges:
1. Steel unions and flanges two inches (2") and smaller: 150 lb. screwed black (brass to iron seat) or galvanized malleable iron (ground joint).

2. Steel unions and flanges two and one-half inches (2 ½") and larger: 150 lb. black flange union, flat-faced, full gasket.
 3. Gaskets: One-sixteenth inch (1/16") thick rubber Garlock No. 122, Johns-Manville or approved equal.
 4. Flange Bolts: Open-hearth bolt steel, square heads with cold pressed hexagonal nuts, cadmium plated in ground. Provide copper-plated steel bolts and nuts or brass bolts and nuts for brass flanges.
- M. Sand for Trench Backfill: Natural sand, free of roots, bark, sticks, rags, or other extraneous material

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Prior to commencement of the work of this Section, obtain written verification from the project Civil Engineer that the rough grade in landscape areas is in conformance with Section 31 0000 - Earthwork.
- B. Examine conditions of work in place before beginning work; report defects.

3.2 PREPARATION

- A. Scheduling: Notify the Project Inspector prior to commencing and/or continuing the work of this Section. Remove and replace, at no cost to Owner, any work required as a result of failure to give the appropriate notification.
- B. Measurements: Take field measurements; report variance between plan and field dimensions.
- C. Protection: Maintain warning signs, shoring and barricades as required. Prevent injury to, or defacement of, existing improvements. At no additional cost to Owner, repair or replace items damaged by installation operations.
- D. Existing Tree Protection:
 1. Avoid unnecessary root disturbance, compaction of soils within drip line, or limb breakage.
 2. Do not store material or dispose of any material other than clean water within the drip line.
 3. Provide adequate irrigation during construction.
 4. Replace any tree damaged during construction with a tree of equal size and value at no additional cost to Owner.
 5. Adjust trench locations in field to minimize damage to existing elements and plant roots of trees-to-remain at no additional cost to Owner.

**IRRIGATION
SECTION 32 8000
3595001**

- E. Surface Preparation: Prior to beginning sprinkler irrigation work, complete placement of topsoil as specified in Section 31 0000 – Earthwork. Notify Project Inspector of irregularities if any.

3.3 AUTOMATIC CONTROLLER

- A. Connect automatic control valves to controller(s) in sequence as shown on Drawings.
- B. Install all exposed wires to a minimum of twenty-four inches (24") beyond controller within a UL approved rigid conduit.

3.4 GRADING

- A. Install all irrigation features to their finished grade and at depths indicated. Complete and /or accommodate all rough grading and/or finish grading before commencing with trenching.

3.5 LAYOUT

- A. Lay out work as accurately as possible to Drawings. Drawings are generally diagrammatic to extent that swing joint offsets and fittings are not shown. Record all changes on the Record Drawings.
- B. Do not willfully install the irrigation system as shown on Drawings when it is obvious, in the field, that obstructions or other discrepancies exist which may not have been considered in the design. Notify Owner's Representative of discrepancies before proceeding.

3.6 EXCAVATING AND TRENCHING

- A. General: Perform excavations as required for installation of work included under this Section, including shoring of earth banks to prevent cave-ins. Restore surfaces, existing underground installations, etc., damaged or cut as result of this work to their original condition and in a manner approved by the Landscape Architect.
- B. Width:
 - 1. Make trenches wide enough to allow a minimum of six inches (6") between parallel pipelines and three inches (3") between side of pipe and side of trench. Do not allow stacking of pipe within trench.
 - 2. Allow a minimum clearance of twelve inches (12") in any direction from parallel pipes of other trades.
- C. Preparation of Excavations: Remove rubbish and rocks from trenches. Bed pipe on a minimum of three inches (3") of clean, rock-free soil to provide a firm, uniform bearing for entire length of pipeline. If clean, rock-free soil is not available, use sand for pipe bedding. See Backfill and Compacting for the remainder of the trench backfill.

- D. Minimum depth of cover: Unless shown otherwise, provide the following minimums:
 - 1. Mainline: twenty-four inches (24") cover.
 - 2. Lateral line: twelve inches (12") cover for spray heads, and eighteen inches (18") cover for rotor heads.
- E. Conflicts with other trades:
 - 1. Hand-excavate trenches where potential conflict with other underground utilities exist.
 - 2. Where other utilities interfere with irrigation trenching and piping work, adjust the trench depth as instructed by Owner's Representative.

3.7 BACKFILL AND COMPACTING

- A. General: Do not begin until hydrostatic tests are completed and when system is operating and after required tests and inspections have been made.
- B. Backfill directly around the pipe: Cover pipe with a minimum of three inches (3") of clean, rock-free soil. If clean, rock-free soil is not available, use sand for three inches (3") of backfill above the pipe. The remainder of the trench backfill material can be native soil or material described below. Do not allow wedging or blocking of pipe.
- C. For backfill of trenches under paving areas:
 - 1. See Section 31 0000 – Earthwork for compaction rates and material
 - 2. See Section 31 2333 – Trenching and Backfilling for trench backfill procedure.
- D. For backfill of trenches in landscape areas:
 - 1. Place backfill in six-inch (6") layers and compact with an acceptable mechanical compactor.
 - 2. Compact backfill material in landscape areas to eighty-five percent (85%) maximum dry density of the soil.
 - 3. If settlement occurs along trenches, make adjustments in pipes, valves, and sprinkler heads, soil, sod or paving as necessary to bring the system, soil, sod or paving to the proper level or the permanent grade, without additional cost to the Owner.
- E. Excess Soil: Remove all rocks, debris, and excess soil that results from sprinkler irrigation trenching operations, landscape planting, and soil preparation operations off site at no additional cost to the Owner. If soil meets topsoil requirements in Section 31 0000 – Earthwork, it may be used for finish grading.
- F. Finishing: Dress-off areas to eliminate construction scars.

**IRRIGATION
SECTION 32 8000
3595001**

3.8 CONTROL WIRES

- A. General: Install control wires beneath sprinkler main line whenever possible; tape wires to mainline pipe. Provide one spare wire for each controller.
- B. Slack Wire: Provide eighteen inches (18") of slack wire for each wire connected to automatic control valve. Slack wire shall be coiled and left in the valve box. Tape wires in bundles every ten feet (10'); do not tape wires in sleeves.
- C. Expansion and Contraction: Snake wire in trench to allow for contraction of wire.
- D. Wire Passing Under Existing or Future Paving or Construction: Encase in PVC Schedule 40 or galvanized steel conduit extending at least twelve inches (12") beyond edges of paving or construction.
- E. Wire Connections: Install wire connections in a waterproof sealing pack.
- F. Wire Splicing: Permit splicing only on runs exceeding 500 feet. Locate all splices within valve boxes.
- G. Wire Termination: Install wire in a valve box with eighteen inches (18") of slack wire coiled and individually capped with approved waterproof sealing pack.
- H. Spare Wire: Install two (2) spare wires along each wire path. If there is more than one wire path from the controller, the contractor to install two (2) spare wires per path. Provide eighteen inches (18") of slack wire at each automatic control valve.

3.9 FLUSHING LINES

- A. Thoroughly flush lines prior to installing valves, performing hydrostatic testing, or installing sprinklers. Divert water to prevent washouts.

3.10 AUTOMATIC CONTROL AND QUICK COUPLER VALVES

- A. Install where shown and where practical; place no closer than twelve inches (12") to walk edges, building walls, or fences. Refer to detail for example.
- B. Thoroughly flush mainline before installing valve.
- C. Install valves in ground cover areas where possible.

3.11 PIPING

- A. General: Install in conformance with reference standards, manufacturer's written directions, as shown on Drawings and as herein specified.
- B. Workmanship:
 - 1. General: Install sprinkler irrigation equipment in planted areas throughout the site.
 - 2. Coordination: Organize location of sleeves with other trades as required.

C. Pipe Line Assembly:

1. General:
 - a. Cutting: Cut pipe square; remove rough edges or burrs.
 - b. Solvent-welded Connections: Use materials and methods recommended by the pipe manufacturer.
 - c. Brushes: Use non-synthetic brushes to apply solvents and primer.
 - d. Cleaning: Clean pipe and fittings of dirt, moisture, and debris prior to applying solvent or primer.
 - e. Assembly: Allow pipe to be assembled and welded on the surface or in the trench.
 - f. Expansion and Contraction: Snake pipe from side to side of trench to allow for expansion and contraction.
 - g. Location: Locate pipes as shown on Drawings except where existing supply valves, utilities or obstructions prohibit or where slight changes are approved to better suit field conditions.
2. Flexible Elastometric Seal Joints:
 - a. General: Assemble in strict conformance with the pipe manufacturer's instruction.
 - b. Rubber Rings: Use rubber rings specific for water service systems.
 - c. Cleaning: Thoroughly clean ring and groove of dirt, moisture and debris using a clean, dry cloth. Do not use solvents, lubricants, cleaning fluids or other material for cleaning.
 - d. Seating: Properly seat ring in groove.
 - e. Spigot:
 - 1) General: Clean spigot-end of pipe as in "Cleaning" above prior to applying lubricant recommended by pipe manufacturer.
 - 2) Seating: Insert spigot into bell and seat to full depth required.
3. Connections:
 - a. Threaded Plastic Pipe Connection:
 - 1) Use Teflon tape or pipe joint compound.
 - 2) When assembling to threaded pipe, take up joint no more than one full turn beyond hand-tight.
 - b. Metal Valves and Plastic Pipe: Use threaded plastic male adapters.
 - c. Metal to Metal Connections:
 - 1) Use specific joint compound or gasket material for type of joint made. Where pipe of dissimilar metals are connected, use dielectric fittings.
 - 2) Where assembling, do not allow more than three full threads to show when joint is made up.
 - d. Where assembling soft metal (brass or copper) or plastic pipe, use strap-type friction wrench only; do not use a metal-jawed wrench.
 - e. Threading:

**IRRIGATION
SECTION 32 8000
3595001**

- 1) Do not permit the use of field-threading of plastic pipe or fittings. Use only factory-formed threads.
 - 2) Use factory-made nipples wherever possible. Permit the use of field-cut threads in metallic pipe only where absolutely necessary. When field-threading, cut threads accurately on axis with sharp dies.
 - 3) Use pipe joint compound for all threaded joints. Apply compound to male thread only.
4. Sleeves and conduits:
- a. Use sleeves of adequate size to accommodate retrieval for repair of wiring or piping and extend a minimum of twelve inches (12") beyond edges of walls or paving.
 - b. Provide removable, non-decaying plug at end of sleeve to prevent entrance of soil.
5. Unions: Locate unions for easy removal of equipment or valve.
6. Capping: Plug or seal opening as lines are installed to prevent entrance materials that would obstruct pipe. Leave in place until removal is necessary for completion of installation.

3.12 SPRINKLER HEADS

- A. Sprinkler heads: Locate as shown on the Drawings except where existing conditions prohibit, or slight changes are approved to achieve as good or better coverage under the same conditions. Do not allow sprinkler head spacing to exceed the maximum shown on the Drawings. Plumb heads.
- B. Handling, Assembly of Pipe, Fittings, and Accessories: Allow only skilled tradesmen to handle and assemble pipe, fittings and equipment. Keep interior of pipes, fittings and accessories clean at all times. Close ends of pipe immediately after installation; leave closure in place until removal is necessary for completion of installation. Do not permit bending of pipe.
- C. Flushing: Remove end heads and operate system at full pressure until all rust, scale, and sand is removed. Divert water to prevent ponding or damage to finished work.
- D. Coverage: Accept responsibility for full and complete coverage of irrigated areas to satisfaction of Landscape Architect and make necessary adjustments to better suit field conditions at no additional costs to Owner.

3.13 FIELD QUALITY CONTROL

- A. Visual Inspection: Verify that all pipe is homogenous throughout and free from visual cracks, holes, or foreign materials. Inspect each length of pipe. All materials are subject to impact test at the discretion of the Landscape Architect.

B. Hydrostatic Tests – Open Trench:

1. Center-load piping with a small amount of backfill to prevent arching or slipping under pressure.
2. Request the presence of the Project Inspector in writing at least forty-eight hours in advance of testing.
3. At no additional cost to Owner, test in the presence of the Project Inspector.
4. Apply continuous static water pressure of 100 psi when welded plastic joints have cured at least twenty-four hours, and with the risers capped, as follows: test main lines and submains for four hours; test lateral lines for two hours.
5. Repair leaks resulting from tests; and repeat tests.
6. Test to determine that all sprinkler heads function according to manufacturer's data and give full coverage according to intent of Drawings. Replace any sprinklers not functioning as specified with ones that do, or otherwise correct system to provide satisfactory performance.

C. Continuity Testing: Test locating device and control wires for continuity prior to and after back-filling operations.

3.14 CLEAN-UP

- A. Remove debris resulting from work of this Section.**

3.15 ADJUSTMENTS AND MAINTENANCE

- A. Adjusting System:** Prior to acceptance, satisfactorily adjust and regulate entire system. Set watering schedule on controller appropriate to types of plants and season of year. Adjust remote control valves to operate sprinkler heads at optimum performance based on pressure and simultaneous demands through supply lines.
- B. System Layout:** Provide reduced prints of Record Document irrigation plans, laminated in four (4) mil. plastic, of size to fit controller door. Enlarge remote-control valve designations as necessary for legibility. Color-code areas covered by each station. Affix plans to inside of controller door.
- C. Instructions:** Upon completion of work, instruct maintenance personnel on operation and maintenance procedures for entire system.
- D. Flow Charts:** Record and prepare an accurate flow-rate chart for each automatic control valve.

3.16 RECORD DRAWINGS

- A. As specified in Section 01 3300, Submittal Procedures, and the following:**
1. Regularly update plans of the system and any changes made to the system throughout the project. Record all changes on this plan before trenches are back-filled.

**IRRIGATION
SECTION 32 8000
3595001**

2. Record complete as-built information and submit the Record Drawings to the Architect before applying for payment for work installed.
3. Show the following on the Record Drawings accurately to scale and dimensioned from two permanent points of reference:
 - a. and spares Distance of mainline from nearby hardscape.
 - b. Location of automatic control valves, quick couplers, and gate valves.
 - c. Location and size of all sleeves.
 - d. Location of automatic control wires.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Soil Preparation and Fertilization
 - 2. Planting
 - 3. Weed Control
 - 4. Mulch
 - 5. Clean-up
 - 6. Landscape Maintenance Period
- B. Work not included in this Section: Landscape elements such as concrete walks, fencing, outdoor lighting, rough grading, and clearing are not a part of this Section unless shown on the landscape Drawings.

1.2 RELATED REQUIREMENTS

- A. Section 31 0000, Earthwork.
- B. Section 32 8000, Irrigation

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CALGreen), edition as noted on the drawings, as adopted by the California Division of the State Architect (DSA).
- C. EPA - Federal Insecticide, Fungicide and Rodenticide Act.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Submittal Procedures:
 - 1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
 - 2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.

LANDSCAPING
SECTION 32 9000
3595001

- B. Pre-Installation Meeting: Request and hold a pre-installation meeting prior to beginning the work of this Section. Parties required to be in attendance are the Landscape Contractor, Project Inspector, Owner's Representative, and Landscape Architect.
- C. Pre-scheduled On-site Project Meetings: Hold regularly-scheduled (monthly or bimonthly as determined by the Landscape Architect) on-site project meetings with the Landscape Architect, Project Inspector and Owner's Representative. Dates and times will be jointly agreed upon.

1.5 ACTION SUBMITTALS

- A. Plant Material: Within fifteen (15) days after award of contract, locate plant materials required for construction. Ensure that trees and shrubs are contract- grown from a certified nursery. Notify Owner's Representative of plant material "tied off" for review at selected nursery. If specified material is not obtainable, submit the following to Owner's Representative: proof of non-availability, proposal for use of equivalent material, photographs of alternative choices of plant material. Include clear, written description of type, size, condition, and general character of plant material.
- B. Data Sheets:
 - 1. Provide product data for each type of landscape material indicated in the Drawings and Specifications.
 - 2. Letter from the manufacturer stating that the soil amendment material submitted for use on this project has no metal fragments or foreign objects.
- C. Samples: Submit samples of the following materials to Landscape Architect for approval:
 - 1. Soil amendment: (3) one-quart zip-locked plastic bags.
 - 2. Bark Mulch: (3) one-quart zip-locked plastic bags.
 - 3. Imported Topsoil: (3) one-quart zip-locked plastic bags.
- D. Provide soils analysis reports prepared by a qualified soils laboratory in accordance with the Soils Testing Requirements under "Soil Testing" in Article SOIL TESTING, in Part 3 of this section.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For landscape contractor.
- B. Prior to planting, submit copies of all trucking or packaging tags for all soil amendment, fertilizer and other additives to Landscape Architect so the quantities can be verified.
- C. Record of Pre-Installation Meeting.

1.7 CLOSEOUT SUBMITTALS

- A. Guarantee: Submit Subcontractor's guarantee.
- B. Record Drawings.

1.8 QUALITY ASSURANCE

- A. Qualifications: Work must be completed by a licensed Landscape Contractor. Provide proof of five years of continuous experience in landscaping and irrigation of projects of similar size (+/- 20% of the construction cost) and scope for education campuses. Landscape Contractor to have a minimum of two projects either completed or in construction in the last five years.
- B. Work Force: Ensure that an experienced foreman is present at all times during installation. Keep the same foreman and workers on the job from commencement to completion.
- C. Reviews: Specifically request reviews of all items listed below in Article INSPECTION REQUIREMENTS prior to progressing to the next level of work. The Owner's Representative reserves the right to inspect and reject material, both at place of growth and at site, before and/or after planting, for compliance with requirements for name, variety, size and quality.
- D. Reference Standards: Meet or exceed Federal, State and County laws requiring inspection of all plants and planting materials for plant disease and insect control.
- E. Plant Material:
 - 1. Conform to the current edition of Horticultural Standards for quality of Number 1 grade nursery stock as adopted by the American Association of Nurserymen. Conform to sizes specified on plant legend. Select plants which have a natural shape and appearance.
 - 2. Select only plants that are true to name, and tag one of each bundle or lot with the name of the plant in accordance with the standards of practice of the American Association of Nurserymen. In all cases, botanical names shall take precedence over common names.
 - 3. Tag each plant of a patented variety with the variety and identification number, where applicable, as it is delivered to the job site.
 - 4. Select only plants which have been nursery-grown in accordance with good horticultural practices and which have been grown under climatic conditions similar to those in the locality of the project for at least one year.
 - 5. Select only plants which are typical of their species or variety; have normal habits of growth; are sound, healthy, vigorous, well-branched and densely-foliated when in leaf; are free of disease, insect pests, eggs or larvae; and have a healthy and well-developed root system.

LANDSCAPING
SECTION 32 9000
3595001

6. Do not use plants that are severely pruned or headed-back to meet size requirements.
7. Do not plant container-grown plants that have cracked or broken balls of earth when taken from the container. Remove canned stock carefully from cans after containers have been cut on two sides with tin snips or other approved cutter.
8. At any time prior to final acceptance, be prepared to replace any plants that are rejected by the Owner's Representative because of physical damage to the plant.
9. Do not remove container-grown stock from containers before time of planting.
10. Furnish quantities necessary to complete the work as shown on the Drawings and, if necessary, make up for any discrepancies in the quantities given in the Plant List at no additional cost to Owner.

1.9 DELIVERY, STORAGE AND HANDLING

- A. Packaged Materials: Deliver packaged materials in original, unopened containers showing weight, certified analysis, name and address of manufacturer, and indication of conformance with state and federal laws if applicable.
- B. Coordinate a time for the Landscape Architect to inspect the plants upon their delivery to the project site.
- C. Bulk Materials:
 1. Do not dump or store bulk materials near structures, utilities, walkways or pavements, or on existing turf areas or plants.
 2. Provide erosion-control measures to prevent erosion or displacement of bulk materials, discharge of soil-bearing water runoff, and airborne dust reaching adjacent properties, water conveyance systems, or walkways.
 3. Accompany each delivery of bulk fertilizers and soil amendments with appropriate certificates.

1.10 FIELD CONDITIONS

- A. Planting Season Limits: Do not plant when grounds are wet or temperature is below 25° F. Do not proceed with any soil preparation and fertilization if all planting cannot be completed within Planting Season Limit.

1.11 INSPECTION REQUIREMENTS

- A. Landscape Architect reserves the right to examine and reject plant material both at place of growth and at site, before and after planting, for compliance with requirements of name, variety, size, and quality.

- B. Obtain verification from Project Inspector for the following at the appropriate times during construction and prior to further progression of work in this Section:
1. Rough grading is to tolerances specified in Section 31 0000 – Earthwork.
 2. The placement of landscape backfill material is as specified in this Section.
 3. Prior to the commencement of planting operations specified in this Section, the coverage and operation of the sprinkler irrigation system are as specified in Section 32 8000 - IRRIGATION.
 4. Required Test: For each load of soil amendment delivered to the site, spread at least two cubic yards (2 cy) of material onto a paved surface approximately two inches (2") deep. Pass a magnetic rake over the material in two directions. If any metal is found, test the entire load in the same manner. Perform all testing in the presence of the Project Inspector.
 5. Soil amendments, fertilizer, bark mulch and materials used for hydroseeding have been delivered to the site by the supplier, the invoices from the supplier indicate the project name and quantities delivered, and the Project Inspector has received copies of all such documents.
 6. Prior to planting, amendments and conditioners have been incorporated as per pre-planting recommendations, and planting areas have been made ready to receive planting.
- C. In case of failure to obtain any verification by the Project Inspector as required above, remove and replace work as necessary to obtain the verification at no additional cost to the Owner.

1.12 PROTECTION

- A. Provide protection for persons and property throughout progress of work. Use temporary barricades as required. Proceed with work in such manner as to minimize spread of dust and flying particles and to provide safe working conditions for personnel. Store materials and equipment where directed.
- B. Existing Construction: Execute work in an orderly and careful manner to protect paving, work of other trades, and other improvements.
- C. Existing Utilities: Provide protection for existing utilities within construction area. At no additional cost to Owner, repair any damages to utility lines that occur as a result of this work.
- D. Landscaping: Protect landscape work and materials from damage due to landscape operations, operations by other contractors and trades, and trespassers. Maintain protection during installation and maintenance periods.

**LANDSCAPING
SECTION 32 9000
3595001**

1.13 PLANTING SCHEDULE

- A. Install, establish, and maintain all lawn areas for a minimum of ninety (90) days prior to date of substantial completion. Coordinate schedule with other work and overall project schedule. Failure to install lawn areas by this date shall result in assessment of liquidated damages.
- B. Proceed with work in an orderly and timely manner to complete installation of landscaping within contract limits.

1.14 LANDSCAPE MAINTENANCE PERIOD REQUIREMENTS

- A. Beginning of Landscape Maintenance Period:
 - 1. General: Landscape Maintenance Period does not begin until all work is installed, as determined by Landscape Architect, in writing.
 - 2. On-site Inspection: When all work is complete, request and hold a meeting to include the Landscape Architect, Project Inspector, Architect and Owner's Representative who must together authorize and determine the start date for the landscape maintenance period. Coordinate and give notice of the date and time of the on-site meeting to all parties at least forty-eight (48) hours in advance.
 - 3. Acceptability: In cases where the lawn has reached adequate fullness and germination in some areas but not all, and authorization has not been given to begin the maintenance period, proceed with mowing, trimming, spraying, etc., as necessary prior to the beginning of the maintenance period.
- B. Duration of Landscape Maintenance Period:
 - 1. The Landscape Maintenance Period shall continue for a minimum of ninety (90) calendar days. During this time, continuously maintain all areas involved until final acceptance of the work by the Owner's Representative. See Landscape Maintenance Period procedure in Article LANDSCAPE MAINTENANCE, in Part 3 of this Section.

1.15 GUARANTEE

- A. The guarantee period for lawn and plant material shall be the duration of the landscape maintenance period, from commencement until final acceptance of the work of this Section.
- B. During the guarantee period, repair and/or replace plants and lawn not in satisfactory growing condition, as determined by Owner's Representative, without additional cost to Owner. Plants are to be replaced in accordance with Article LANDSCAPE MAINTENANCE in Part 3 of this Section, using plants of the same kind and size specified in plant list.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Use material in new and perfect condition as specified. Any deviations or substitutions from the Specification and Drawings must first be approved by Owner's Representative in writing prior to use.

2.2 SOIL PREPARATION MATERIALS

- A. Topsoil: Fertile; friable; natural loam surface soil; reasonably free of subsoil, clay lumps, brush, weeds and other litter; and free of roots, stumps, stones/rocks, and other extraneous or toxic matter harmful to plant growth.
- B. Soil Amendment: One-percent nitrogen-impregnated bark product with a ninety-percent (90%) bark base and zero to one-quarter inch (0-1/4") particle size, or approved equivalent. Do not spread until testing requirements have been satisfied.
- C. Fertilizer/Soil Conditioner: Gro-Power Plus or approved equal.
- D. Fertilizer for Trees: Seven-gram Gro-Power Planting Tablets (12-8-8 NPK) or approved equal.
- E. Vitamin B-1: "Superthrive", "Liquinox Start", "Cal-Liquid", or approved equal.

2.3 MISCELLANEOUS LANDSCAPE MATERIALS

- A. Bark Mulch: Untreated, shredded cedar.
- B. Tree-staking System: As indicated on Drawings.
- C. Pre-Emergent Weed Control: Oxadiazon, "Treeflan", "Ronstar 2G", "Surflan" (Elano Products Company), or approved equal.

2.4 PLANT MATERIAL:

- A. Nursery Plant Stock:
 - 1. As indicated on Drawings. Do not remove container-grown stock from containers until planting time. Plants shall be true to name.
 - 2. Healthy, shapely, well-rooted, not pot-bound, free from insect pests or plant diseases and properly "hardened off" before planting. Replace plants that are not alive or are not in satisfactory growing condition, as determined by the Landscape Architect, without additional cost to Owner. The Landscape Architect may reject plants before and/or after planting.

PART 3 - EXECUTION

3.1 SITE CONDITIONS

- A. Examine the site, verify grade elevations, and observe conditions under which work is to be performed. Do not proceed with work until unsatisfactory conditions have been corrected in a manner acceptable to the Owner's Representative.
- B. Proceed with complete landscape work as rapidly as portions of the site become available, working within seasonal limitations for each kind of landscape work required.
- C. Determine location of underground utilities and perform work in a manner which will avoid possible damage. Hand-excavate, as required, to minimize possibility of damage to underground utilities. Maintain grade stakes set by others until removal is mutually agreed upon by parties concerned.
- D. When conditions detrimental to sod or plant growth are encountered, such as rubble fill, adverse drainage condition, or other obstructions, notify the Owner's Representative before planting.

3.2 SOIL TESTING

- A. Coordinate soil testing in an expeditious and timely manner as required for on-site topsoil materials. Contract with a soil laboratory and include cost of sampling and testing in contract price. Take one (1) sample for every 5,000 square feet of landscape area up to a maximum of six (6) samples under the direction of and in the presence of the Owner's Representative.
- B. Submit each sample, according to the quantity of soil required by testing laboratory, to a competent laboratory approved by the Owner's Representative.
- C. Provide analysis of soil samples for pH, salinity, ammonia, phosphate, potassium, calcium, magnesium, boron, and sodium levels. Provide appraisal of chemical properties, including particle size determination, and recommendations for types and quantities of amendments and fertilizers.

3.3 PREPARATION

- A. Clearing of Vegetation:
 - 1. If live perennial weeds exist on site at the beginning of work, spray with a non-selective systemic contact herbicide as recommended and applied by an approved licensed landscape pest control advisor and applicator. Leave sprayed plants intact for at least 15 days.
 - 2. Clear and remove existing weeds by mowing or grubbing off all plant parts at least one-quarter inch ($\frac{1}{4}$ ") inch below surface of soil over entire areas to be planted.

B. Soil preparation:

1. Loosen soil in all planting areas, and on slopes flatter than 3:1 gradient, to a depth of six to eight inches (6" - 8") below finish grade. All debris, foreign matter, and stones shall be removed prior to the placing of any fertilizers or conditioners. Soil preparation is for all shrub planting beds, lawn hydroseeded areas and sodded lawn areas.
2. Conduct the required soil tests and instruct the lab to include a minimum of the following soil improvements in the recommendation on the soils report.
 - a. Soil Amendment: Two cubic yards (2 cy) per 1,000 square feet.
 - b. Gro-Power Plus: One hundred fifty pounds (150 lbs) per 1,000 square feet.
 - c. If the lab recommends less than six cubic yards (6 cy) of soil amendment, the excess bid amount shall be applied to the cost of any additional recommended soil improvements, or returned to the Owner as a credit
3. Apply amendments as follows, using rates recommended by the soils testing laboratory (the rates of amendments shown below are for bidding purposes only):
 - a. Fertilizer/Soil Conditioner: Broadcast 150 pounds of Gro Power Plus per 1,000 square feet in all planting areas and rototill to a depth of six to eight inches (6" - 8"). Remove from the site any rock and debris brought to the surface by cultivations. "Cultipack" all areas to receive sod or hydroseed.
 - b. Apply soil amendment to all planting areas at the rate of six cubic yards (6 cy) per 1,000 sf and rototill into the top six to eight inches (6" - 8").
4. Upon completion of finish grading, request a review and obtain approval of Landscape Architect prior to commencement of planting or hydroseeding.

C. Finish Grading for all Planting areas

1. Refer to Earthwork Specification Section for Rough Grading.
2. Grade to elevations and contours shown on Drawings. Fill low spots with landscape backfill material and grade to surface drain in manner indicated on Drawings.
3. Finish-grade so that the entire area within the contract lines has a natural and pleasing appearance as specified and as directed by Landscape Architect.
4. Adjust sprinkler heads flush to finish grade in preparation to receive hydroseeding or one-half inch above finish grade in preparation to receive sod. Reset sprinkler heads flush to grade after turf has germinated.
5. Flag the sprinkler heads and valve markers.

D. Planting Pits for Trees:

1. Excavate pits with vertical sides and with bottom of excavation slightly raised at center to provide proper drainage.

LANDSCAPING
SECTION 32 9000
3595001

2. Set container-grown stock in center of pit on earth pedestal. Separate roots and/or prune roots as directed by Landscape Architect. In hot weather, pre-wet pit. Loosen outside roots from sides and bottom of root ball. When set, place additional backfill around base and sides of root ball. Work each layer to settle backfill and eliminate voids and air pockets. Water after placing final layer of backfill.
3. Loosen hard subsoil in bottom of excavation. Extend excavation as required to insure proper drainage from plant pits.
4. Fill excavated planting pits with water to half the depth of pit. Pits should drain within four hours (4 hrs). If planting pits do not drain, notify Project Inspector immediately. Do not proceed with planting until Landscape Architect has resolved a method to provide drainage.

3.4 PLANTING

A. Trees:

1. Lay out individual trees locations and areas for multiple plantings. Stake the locations, outline the areas, and secure the Owner's Representative's acceptance before beginning the planting work. Make minor adjustments as requested.
2. Scarify root ball prior to planting. Plant in holes twice the diameter of the root ball and to a depth equal to the container's height. Place the shrub and/or groundcover so the top of the root ball is one inch (1") higher than the surrounding grade. Set container-grown stock in center of pit. In hot weather, pre-wet the pit. When set, place additional backfill around base and sides of root ball. Work each layer to settle backfill and eliminate voids and air pockets. Thoroughly compact lower half of backfill in plant pit. See staking or guying detail. Water after planting. Provide a berm or watering basin for each tree. Add Vitamin B-1, in the proper solution as recommended by the manufacturer, to the second watering of the basin.
3. Place fertilizer planting tablets in root zone and alongside each plant. Follow manufacturer's instructions for number of tablets to use for each container size.
4. See Drawings for additional information.
5. Grooming and Staking of Trees:
 - a. Prune, thin-out and shape trees in accordance with standard horticultural practice. Prune trees to retain required height and spread. Unless otherwise directed by Landscape Architect, do not cut tree leaders, and remove only injured or dead branches from flowering trees.
 - b. Paint cuts over one-half inch ($\frac{1}{2}$ ") in size with standard tree paint or compound, covering exposed, living tissue. Use paint that is waterproof, antiseptic, adhesive, elastic and free of kerosene, coal tar, creosote, and other substances harmful to plants. Do not use shellac.
 - c. Stake or guy trees immediately after planting, as indicated on Drawings.

- B. Request review by the Landscape Architect after locating, but prior to planting all trees. Under the direction of the Landscape Architect, make slight adjustments to plant material location as necessary to reflect original intention of Drawings.

3.5 WEED CONTROL

- A. Apply pre-emergent weed control to all planting areas (except lawn) after completion of all planting and one complete watering. Follow manufacturer's directions. To prevent washing away of weed control, do not over-water after its application. Do not allow any weed control into lawn areas. Treat any existing noxious weeds, such as Johnson grass, with Roundup in successive treatments until all roots are destroyed, then remove all grass and roots. Notify Owner's Representative of time of installation for verification of application.

3.6 BARK MULCH

- A. Apply mulch at the rate of three inches (3") deep to all planting areas, exclusive of lawn, after the planting and weed control are completed. Twelve inches (12") from planter edges, taper full depth of mulch to meet adjacent grades. Do not place mulch within three inches (3") of trunk or stems.

3.7 CLEAN-UP

- A. During construction, keep the site free of rubbish and debris, and clean up the site promptly when notified to do so. Take care to prevent spillage on streets from hauling and immediately clean up any such spillage and/or debris deposited on streets due to the work of this Section.
- B. During all phases of the construction work, take all precautions to abate dust nuisance by clean-up, sweeping, sprinkling with water, or other means as necessary.
- C. Paving: Maintain cleanliness of paving areas and other public areas used by equipment, and immediately remove spillage; remove rubbish, debris, and other material resulting from landscaping work, leaving site in a safe and clean condition.

3.8 LANDSCAPE MAINTENANCE

- A. The Landscape Maintenance Period will begin when all the Landscape Maintenance Period Requirements have been met (See Part 1 of these Specifications).
- B. Cleaning: Maintain cleanliness on paving areas and other public areas used by equipment and immediately remove all spillage. Remove from project site all rubbish and debris found thereon and all material and debris resulting from landscaping work, leaving the site in a safe and clean condition.

**LANDSCAPING
SECTION 32 9000
3595001**

C. Maintenance:

1. Sprinkler Irrigation System:

- a. Check system weekly for proper operation. Flush lateral lines out after removing last sprinkler head or two at each end of lateral. Adjust all heads as necessary for unimpeded coverage.
- b. Set and program automatic controllers for seasonal water requirements. Provide the Owner's Representative with keys to the controllers and instructions on how to turn off system in case of emergency.
- c. Repair all damages to sprinkler irrigation system as part of the contract work. Make repairs within one watering period or one week, whichever is the least amount of time.

2. Trees:

- a. Water enough that moisture penetrates throughout root zone and only as frequently as necessary to maintain healthy growth.
- b. Construct and/or remove water basins around each plant, depending on the time of the year and as directed.
- c. Do not prune unless directed by the Landscape Architect.
- d. Replace any dead, dying or vandalized plant material on a weekly basis throughout the Landscape Maintenance Period.

3. Insecticide and Herbicide Application:

- a. If needed, control weeds with selective herbicides and sprays. In areas where crabgrass has infested the lawn, apply pre-emergent herbicides such as Dacthal by Amvac, Balan, or Betasan by Gowan for control prior to crabgrass germination. Control insect pests if necessary.
- b. Use only a licensed Pest Control Operator to apply herbicides and sprays and to maintain a log for applications indicating material, timing, and rate.

D. Final Acceptance of the Landscape Maintenance Period: request on-site meeting forty-eight hours (48 hrs.) in advance with the Landscape Architect and Owner's Representative to determine the end of the Landscape Maintenance Period.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Domestic water piping system.
 - 2. Fire protection piping systems.
 - 3. Sewer piping system

1.2 RELATED REQUIREMENTS

- A. Section 01 5000, Temporary Facilities and Controls.
- B. Section 01 6116, Volatile Organic Compound (VOC) Restrictions, for VOC limits pertaining to adhesives, sealants, fillers, primers, and coatings.
- C. Section 01 8113, Sustainable Design Requirements, for CAL-Green [and Collaborative for High Performance Schools (CHPS)] general requirements and procedures.
- D. Section 31 0000, Earthwork.
- E. Section 31 2333, Trenching and Backfilling.
- F. Section 32 1600, Site Concrete.

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CAL Green), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- C. California Plumbing Code, (CPC), edition as noted on the Drawings.
- D. California State Health and Safety Code Section 116875, Lead Free Public Water Systems.
- E. Local Jurisdiction: Any work within the street, highway or right-of-way shall be performed in accordance with the requirement of the governmental agencies having jurisdiction, and shall not begin until all of those governing authorities have been notified.
- F. ASTM International (ASTM):
 - 1. D422-63: Test Method for Particle Size Analysis of Soil.
 - 2. D698-00: Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures, Using 5.5 lb (2.49 Kg) Rammer and 12 inch (304.8 mm) Drop.

3. D1556-00: Test Method for Density of Soil in Place by the Sand-Cone Method.
4. D1557-02: Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 10 lb. (4.54 Kg) Rammer and 18 inch (457 mm) Drop.
5. D3017-05: Test Methods for Moisture Content of Soils and Soil-Aggregate Mixture by Nuclear Methods (Shallow Depth).
6. D4318-05: Test Method for Liquid Limit, Plastic Limit, and Plasticity Limit.

G. CALTRANS Standard Specifications.

H. CAL-OSHA, Title 8, Section 1590 (e).

I. NFPA 13, 24 and 25, per CFC chapter 80 and CBC chapter 35.

1.4 ADMINISTRATIVE REQUIREMENTS

A. Submittal Procedures:

1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
3. Sustainable Design Submittals shall comply with the additional requirements of Section 01 8113, Sustainable Design Requirements.

1.5 ACTION SUBMITTALS

- A. Provide supplier's descriptive literature for all products to demonstrate compliance with specified attributes.
- B. Substitution: Provide all data of proposed material being submitted as a substitution. Provide comparison with specified product data and identify all differences. Failure to provide comparison will be reason for rejection.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For contractor / installer.
- B. Provide sieve analysis from accredited testing lab on pipe bedding material. Analysis shall have a current date not older than project contract signing date.
- C. Sustainable Design:
1. General:
 - a. Submit information necessary to establish and document compliance with the California Green Building Standards Code.
 - b. Sustainable design submittals are in addition to other submittals.
 2. The following information shall be provided:
 - a. Adhesives and Sealants: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.

- b. Paints and Coatings: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.

1.7 CLOSEOUT SUBMITTALS

- A. Guarantee: Submit subcontractor's guarantee.
- B. Water Sterilization Test Report.

1.8 QUALITY ASSURANCE

- A. Contractor / Installer shall have been in business for five (5) years providing/finishing similar size projects and complexity.
- B. Contractor shall be solely responsible for all subgrades built. Any repairs resulting from inadequate compaction or incorrect grades will be the responsibility of the contractor.
- C. The representatives of the Owner's testing lab will not act as supervisor of construction, nor will they direct construction operations. Neither the presence of the Owner's testing lab representatives nor the testing by the Owner's testing lab shall excuse the contractors or subcontractors for defects or deficiencies discovered in their work during or following completion of the project. Correcting inadequate compaction is the sole responsibility of the contractor.
- D. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the drawings to be salvaged and re-used.
 - 1. Sun damaged or discolored PVC pipe will be rejected.
- E. All materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.

1.9 FEES, PERMITS, AND UTILITY SERVICES

- A. Obtain and pay for permits and service charges required for installation of Work. Arrange for required inspections and secure written approvals from authorities having jurisdiction.
- B. Upon completion of work within right-of-way, provide copies of written final approval to the Architect.

1.10 DELIVERY, STORAGE AND HANDLING

- A. Transport, store and handle in strict accord with the local jurisdiction and manufacturer's written recommendations
- B. Deliver undamaged products to job in manufacturer's sealed containers and/or original bundles with tags and labels intact.

1.11 EXISTING SITE CONDITIONS

- A. Contractor shall acquaint himself with all site conditions. If unknown active utilities are encountered during work, notify Architect promptly for instructions. Failure to notify will make Contractor liable for damage to these utilities arising from Contractor's operations subsequent to discovery of such unknown active utilities.
- B. Existing civil, mechanical and electrical improvements are shown on respective site plans to the extent known. Should the Contractor encounter any deviation between actual conditions and those shown, he is to immediately notify the Architect before continuing work.

1.12 PROTECTION

- A. Adequate protection measures shall be provided to protect workmen and passers-by on and off the site. Adjacent property shall be fully protected throughout the operations. Blasting will not be permitted. Prevent damage to adjoining improvements and properties both above and below grade. Restore such improvements to original condition should damage occur. Replace trees and shrubs outside building area disturbed by operations.
- B. In accordance with generally accepted construction practices, the Contractor shall be solely and completely responsible for working conditions at the job site, including safety of all persons and property during performance of the work. This requirement shall apply continuously and shall not be limited to normal working hours.
- C. Any construction review of the Contractor's performance conducted by the Geotechnical Engineer is not intended to include review of the adequacy of the Contractor's safety measures, in, on, or near the construction site.
- D. Provide shoring, sheeting, sheet piles and or bracing to prevent caving, erosion or gullyng of sides of excavation.
- E. Surface Drainage: Provide for surface drainage during period of construction in manner to avoid creating nuisance to adjacent areas. The contractor shall make a reasonable effort on a daily basis to provide pumps and all equipment necessary to keep all excavations and the site free from water during entire progress of work, regardless of cause, source, or nature of water.
- F. Adjacent streets and sidewalks shall be kept free of mud, dirt or similar nuisances resulting from earthwork operations.
- G. The site and adjacent influenced areas shall be watered as required to suppress dust nuisance. Dust control measures shall be in accordance with the local jurisdiction.
- H. Trees: Carefully protect existing trees that are to remain. Provide temporary irrigation as necessary to maintain health of trees.

1.13 SEASONAL LIMITS

- A. No fill material shall be placed, spread or rolled during unfavorable weather conditions. When work is interrupted by rains, fill operations shall not be resumed until field tests indicate that moisture content and density of fill are satisfactory.

1.14 RECORD DRAWINGS

- A. Keep a daily record of all pipe placed in ground, verified by Project Inspector.
- B. Upon completion of this Contract, furnish one tracing showing all outside utility lines, piping, etc., installed under this Contract. Locate and dimension all work with reference to permanent landmarks.
- C. All symbols and designations used in preparing "RECORD" drawings shall match those used in Contract drawings.
- D. Properly identify on as-builts and provide dimensions for all stubs for future connections. Provide concrete markers 6" dia. 12" deep, flush with finish grade at the ends of all stubbed pipes.
- E. Provide record drawings per Section 01 3300.

PART 2 - PRODUCTS

2.1 DESIGN AND PERFORMANCE CRITERIA

- A. Sustainable Design:
 - 1. VOC emissions for field-applied adhesives, sealants, and sealant primers must comply with limits specified in Section 01 6116.
 - 2. VOC emissions for field-applied paints and coatings must comply with limits specified in Section 01 6116.

2.2 MATERIALS - GENERAL

- A. Provide each item listed herein or shown on drawings of quality noted or approved equal. All material shall be new, full weight, standard in all respects and in first-class condition. Insofar as possible, all materials used shall be of same brand or manufacture throughout for each class of material or equipment. Materials shall be of domestic manufacture and shall be tested within Continental United States.
- B. Grade or quality of materials desired is indicated by trade names or catalog numbers stated herein.
- C. Dimensions, sizes, and capacities shown are minimum and shall not be changed without permission of Architect.
- D. All materials in this section used for any public water system or domestic water for human consumption shall be lead free.

1. For the purposes of this section, "lead free" means not more than 0.2 percent lead when used with respect to solder and flux and not more than 8 percent when used with respect to pipes and pipe fittings.
2. All pipe, pipe or plumbing fitting or fixtures, solder, or flux shall be certified by an independent American National Standards Institute (ANSI) accredited third party, including, but not limited to, NSF International, as being in compliance with this section.

E. All materials used for fire system piping shall be UL and FM approved.

2.3 VALVE BOXES

- A. Provide at each valve or cock in ground a Christy, Brooks, or equal to Christy G05CT, concrete valve box with cover marked for service, domestic water shall be marked "Water" and fire supply shall be marked "Fire". Furnish extension handles for each size square nut valve, and provide "fork" handle for each size of "wheel handle" valve as required. Do not locate valve boxes in walk, or covered passages, curbs, or curb & gutters, unless necessary. If valve location is within concrete or asphalt paved surface valve box shall be as detailed on plans for such condition. Provide valve box extensions as required to set bottom of valve box to bottom of piping in which valve is installed. Provide Owner with set of special wrenches and/or tools as required for operation of valves.

2.4 PIPES AND FITTINGS

- A. Sanitary Sewer: PVC sewer pipe and fittings with Ring-Tite joints, ASTM D3034 SDR35.
- B. Domestic water Lines 3 1/2" and smaller: Type K copper tubing, hard temper, with wrought copper fittings. Schedule 80 PVC, ASTM D 1784, ASTM D 1785.
- C. Water lines 4" and larger: AWWA C-900 Class 150/DR18 with rubber gasket joints.
- D. Fire lines 4" and larger: AWWA C-900 Class 200/DR14 with rubber gasket joints.
- E. Solder: Lead Free. 95/5; 95% Tin / 5% Antimony.
- F. Ductile Iron Pipe; AWWA Class 51, Cement Lined
- G. Ductile Iron Pipe Fittings; AWWA C110, C153, Ebba Iron, Star Romac, Sigma, or approved equal.
- H. PVC Mechanical Fittings; Ebba Iron, Star; Romac; Sigma or approved equal.
- I. Ductile Iron Pipe/PVC C-900 Pipe Restrained Fittings; Ebba Iron # 3800 Mega Coupling, Ebba Iron 1100CH Split Restrained Harness for pipe couplings. StarGrip Series 4000.
- J. Ductile Iron Pipe/PVC C900, C905 Restrained Degreedand Blind Cap Fittings,;
- K. Mega Lug; Sigma; Romac; or an approved equal

- L. Mechanical Fitting Bolts; Bolts and nuts shall be carbon steel with a minimum 60,000 psi tensile strength conforming to ASTM A 307, Grade A. Bolts shall be standard ANSI B1.1 Class 2A course threads. Nuts shall conform to ASTM A 563 and be standard ANSI B1.1, Class 2A course thread. All bolts and nuts shall be zinc coated.
- M. Fasteners Anti-Rust Coatings; After assembly, coat all fasteners with an Asphaltic Bituminous coatings conforming to latest edition NFPA 24.
- N. Ductile Iron Pipe Wrap; 8 mil polyethylene pipe wrap conforming to ANSI/AWWA C105/A21.5 standards.
- O. Pipe Insulation; Pipe exposed to atmospheric conditions ½" thru 4" NPT; Johns Manville rigid fiberglass insulation, Micro Lok HP; Owens Corning Fiberglas SSL II; Conforming to ASTM C 612, Type 1A or type 1B.
- P. Aluminum field applied pipe insulation jacket; comply with ASTM B209, ASTM C1729, ASTM C1371 Manufacturers; Childers Metals; ITW Insulation Systems Aluminum Jacketing; or an approved equal.
 - 1. Finish shall be flat mill finish
 - 2. Factory Fabricated Fitting Covers; 45 and 90 degree elbows, tee's, valve covers, end caps, unions, shall be of the same thickness and finish of jacket.
 - 3. The fittings shall be composed of 2-pieces
 - 4. Adhesives; per the manufacturers requirements
 - 5. Joint Sealant; shall be silicone, and shall be aluminum in color.
- Q. Sewer Forced Main; HDPE, DR 11, color gray with green stripe by JM Eagle or approved equal.

2.5 SANITARY SEWER MANHOLES

- A. Shall be constructed as shown on plan details.

2.6 CLEANOUTS

- A. Cleanouts of same diameter as pipe up to 8" in size shall be installed in all horizontal soil and waste lines where indicated and at all points of change in direction. Cleanouts shall be located not less than 18" from building so as to provide sufficient space for rodding. No horizontal run over 100 feet shall be without cleanout whether shown on drawings or not.
- B. All cleanout boxes shall be traffic rated with labeled lid, Christy G05CT or approved equal. Lid shall be vandal proof with stainless steel screws

2.7 UNIONS

- A. Furnish and install one union at each threaded or soldered connection to equipment and 2 unions, one on each side of valves on pipes ½" to 3".

- B. Locate unions so that piping can be easily disconnected for removal of equipment or valve. Provide type specified in following schedule:

Type of Pipe Union

Steel Pipe: 150 lb. Screwed malleable ground joint, brass, brass-to-iron seat, black or galvanized to match pipe.

Copper tubing: Brass ground joint with sweat connections.

PVC Sch 80 pipe: PVC union, FIPT X FIPT

2.8 VALVES

- A. Provide valves as shown and other valves necessary to segregate branches or units. Furnish valves suitable for service intended. Valves shall be properly packed and lubricated. Valves shall be non-rising stem. Place unions adjacent to each threaded or sweat fitting valve. Install valves with bonnets vertical. All valves shall be lead free.
- B. Valves ½" thru 2"; shall be made of bronze, full size of pipe and lead free. Nibco S-113-FL Series; American G-300 Series; Matco 511 FL Series; Apollo 102T-FL Series. Brass valves of brass parts within valves will not be accepted.
- C. Valves, 2 ½" thru 3" shall be class 150; Shall be made of bronze, full size of pipe; Jenkins Fig. 2310 J; Lunkinheimer Fig. 2153; Crane Fig. 437; Stockham Fig. B-128.
- D. Valves, Flanged; 4" thru 12" Ductile Iron Resilient Wedge Gate Valve; Nibco F 609 RW; American 2500 Series; Kennedy 8561; Mueller 2360 Series.

2.9 TAPPING SLEEVE

- A. Shall be used on pipe sizes 6" thru 12" and shall be made with stainless steel material including stainless steel bolts. Flanges shall be ductile iron or high carbon steel. Gaskets shall seal full circumference of pipe. Shall be manufactured for operating pressure of 200 psi, and shall pass test pressure of 300 psi. Romac SST series; Smithblair 662; Mueller H304; Ford "FAST" tapping sleeve.

2.10 SERVICE SADDLES

- A. Shall be used on pipe size 2" thru 4". Body shall be made from ductile iron with epoxy coating or bronze. Cascade Style CSC-1; A.Y. McDonald model 3891 AWWA/3892 FNPT; Smith-Blair #317; Ford S70, S71, S90, (style B).

2.11 TRACER WIRE

- A. No. 10 THW solid copper wire. Solder all joints

PART 3 - EXECUTION

3.1 DRAWINGS AND COORDINATION

- A. General arrangement and location of piping, etc., are shown on Drawings or herein specified. Install work in accord therewith, except for minor changes that may be necessary on account of other work or existing conditions. Before excavation, carefully examine other work that may conflict with this work. Install this work in harmony with other craft and at proper time to avoid delay of work.
- B. Verify invert elevations at points of connection to existing systems prior to any excavation. If invert elevations differ from that shown on drawings, notify Architect immediately.
- C. In advance of construction, work out minor changes if conflicts occur with electrical or mechanical. Relocate services to suit actual conditions and work of other trades to avoid conflict therewith. Any adjustments or additional fittings to make adjustments shall not be cause for additional costs to the owner.
- D. Execute any work or apparatus shown on drawings and not mentioned in specifications, or vice versa. Omission from Drawings or Specifications of any minor details of construction, installation, materials, or essential specialties does not relieve Contractor of furnishing same in place complete.
- E. Graded pipes shall take precedence. If conflict should occur while placing the domestic water and fire service piping, the contractor shall provide any and all fittings necessary to route the water lines over such conflicting pipes at no additional costs to the owner.

3.2 ACCESS

- A. Continuously check for clearance and accessibility of equipment or materials specified herein to be placed. No allowance of any kind shall be made for negligence on part of Contractor to foresee means of installing his equipment or materials into proper position.

3.3 EXCAVATING AND BACKFILLING

- A. Excavation and Bedding:
 - 1. General: Trench straight and true to line and grade with bottom smooth and free of irregularities or rock points. Trench width to be a minimum of 12" wider than outside diameter of pipe. Follow manufacturer's recommendations for use of each kind and type of pipe.
 - 2. Bedding: Provide a bedding as noted on drawing details for the full length of the pipe. Bedding shall have a minimum thickness beneath the pipe of 4" or 1/8 the outside diameter of the pipe, which ever is greater. Provide bell holes and depressions for pipe joints only of size required to properly make joint.
 - 3. If the trenches for the site utilities falls within areas to be lime treated, the piping shall be installed prior to any lime treatment operations, providing the elevation of the piping is below the treatment section.

UTILITIES
SECTION 33 0000
3595001

- a. If trenching is necessary in areas that have been previously lime treated the contractor shall backfill the trench with class 2 aggregate base, with minimum section equal to the lime treated section and compacted to 95%.

B. Laying of Pipe:

- 1. General: Inspect pipe prior to placing. Sun damaged pipe will be rejected. Set aside any defective or damaged material. Do not place pipe in water nor place pipe when trenches or weather are unsuitable. Lay pipe bell up grade, true to line and grade.
 - a. Sewer pipe shall be laid in strict conformity to the prescribed line and grade, with grade bars set and each pipe length checked to the grade line. Three consecutive points on the same rate of slope shall be used at all times to detect any variation from a straight grade. In any case of discrepancy, work shall be stopped and the discrepancy immediately reported to the Owner's Representatives. In addition, when requested by the Owner's Representative, a string line shall be used in the bottom of the trench to insure a straight alignment of the sewer pipe between manholes. The maximum deviation from grade shall not be in excess of 1/4 inch. In returning the pipe to grade, no more than 1/4" depression shall result.
 - b. The Contractor shall expose the end of existing pipe to be extended, for verification of alignment and elevation, prior to trenching for any pipe which may be affected. All costs of such excavation and backfill shall be included in the price paid for the various items of work.
 - c. A temporary plug, mechanical type shall be installed on sewer pipe at the point of connection to existing facilities. If connecting to a public facility the plug shall conform to the requirements of the local jurisdiction. This plug shall remain in place until the completion of the balling and flushing operation.
- 2. Bell and Spigot Joints: Lubricate inside of bells and outside of spigots with soap solution. Wedge joints tight. Bell of bell and spigot pipe to be pointed up grade.

C. Backfilling:

- 1. General: Do not start backfill operations until required testing has been accomplished.
- 2. Compaction and Grading: Remainder of backfill shall be in accordance with Section 31 2333 – TRENCHING AND BACKFILLING.
- 3. If trenching in area previously lime or cement treated backfill top of trench section, same depth as lime or cement treatment with Class 2 Aggregate Base compacted to 95% minimum relative compaction.

3.4 INSTALLATION OF WATER PIPING

- A. Immediately cap or plug ends of, and opening in, pipe and fittings to exclude dirt until final connections made. Use reducing fittings where any change in pipe size occurs. Bushings shall not be used.

- B. General: Should existing conditions or other work prevent the running of pipes or the setting of equipment at the points indicated by drawings, changes as authorized by the Architect shall be made without additional cost to the Owner.
- C. All bolts used on mechanical fittings shall be thoroughly coated with an asphaltic bituminous coating conforming to 2007 NFPA (National Fire Protection Association) 10.3.5.2 and 10.8.3.5, CBC chapter 35 and CFC chapter 80.
- D. All buried metal shall be incased with 8 mil polyethylene wrap so that no soil is in contact with metal. Ends of polyethylene wrap shall be taped to provide seal with pipe.
- E. Do not install water lines in same trench with non-metallic sewer lines unless bottom of water pipe at all points is at least 12" above top of sewer line and water line is placed on solid shelf excavated at one side of common trench with a minimum of 12 inch horizontal separation.
- F. Under no circumstance shall a fitting be located directly under a structural footing without prior approval from the Architect.
- G. In locations where existing domestic pipe is rerouted, the new pipe shall be assembled using restrained fittings at all joints including factory pipe joints. Tapped restrained blind flanges shall be temporarily installed at each end of the assembled pipes until testing and chlorination is completed and approved.

3.5 CLOSING IN OF UNINSPECTED WORK

- A. Do not allow or cause work installed to be covered up or enclosed before it has been inspected, tested, and approved. Should work be enclosed or covered up before it has been approved, uncover work at own expense. After it has been inspected, tested and approved, make repairs necessary to restore work of other contractors to condition in which it was found at time of cutting.

3.6 CARE AND CLEANING

- A. Repair or replace broken, damaged, or otherwise defective parts, materials, and work. Leave entire work in new condition satisfactory to Architect. At completion, carefully clean and adjust equipment, fixtures and trim that are installed as part of this work. Leave systems and equipment in satisfactory new operating condition.
- B. Drain and flush piping to remove grease and foreign matter.
- C. Sewer piping shall be balled and flushed.
- D. Clean out and remove surplus materials and debris resulting from the work, including surplus excavated material.
- E. Flush fire service piping in the presence of the project inspector. Flushing shall be continued for a sufficient time as necessary to ensure all foreign material has been removed. Flow rate shall be equal to site fire flow requirements.

3.7 SEWER INTERNAL INSPECTIONS

- A. Upon completion of construction and prior to final inspection, the Contractor shall clean the entire new pipeline of all dirt and debris. Any dirt or debris in previously existing pipes or ditches in the area, which resulted from the new installation, shall also be removed. Pipes shall be cleaned by the controlled balling and flushing method. Temporary plugs shall be installed and maintained during cleaning operations at points of connection to existing facilities to prevent water, dirt, and debris from entering the existing facility.

3.8 TEST OF PIPING

- A. Pressure Test piping at completion of roughing-in, in accord with following schedule, and show no loss in pressure or visible leaks after minimum duration or four (4) hours at test pressures indicated.
- B. Chlorination tests shall be performed after all fixtures and any required mechanical devices are installed and the entire system is complete and closed up.
- C. In cases where new domestic water piping is assembled for re-routing of existing domestic water pipe, the contractor shall perform the following testing prior to connecting the new water pipe to the existing system.
 - 1. The pipe shall be pressure tested and per the test schedule.
 - 2. The pipe shall be pressure tested down within the trench.
 - 3. The contractor shall dig a temporary ditch below the existing pipe to drain to a sump that is lower than the bottom of the trench and to the side of the trench. The sump shall be 30% larger than the total volume of water within the testing pipe assembly.
 - 4. After pressure testing and chlorination has taken place and accepted, the contractor shall drain the pipe into the sump and pump the sump out as it is filling.
 - 5. The temporary test fittings at each end of the pipe assembly shall be removed and the final restrained couplings installed.
 - 6. The existing piping shall be cut and the water within the pipe shall drain below the pipe to the temporary sump. Pump the sump as it is being filled up. Take extreme caution not to contaminate the existing pipe with any contaminants within the trench.
 - 7. Before making the final coupling connections, the restrained couplings at each end of the new pipe shall be thoroughly swabbed inside the fitting with a solution of chlorine mixed with water at a rate of 1 part chlorine to 4 parts potable water.
 - 8. After final connections are made, a visual inspection shall be made after fittings are wiped off. If after 1 hr, no noticeable drips are noted the pipe can be backfilled.
 - 9. The contractor shall flush all water piping affected by chlorination until it is within acceptable levels approved by certified testing lab.

TEST SCHEDULE

<u>System Tested</u>	<u>Test Pressure PSIG Test With</u>
Public Water Mains	Per local jurisdiction requirements.
Private Domestic Water Piping:	150 Lbs. Water 4 hrs.
Fire Protection Piping:	200 Lbs. Water pressure, 4 hrs duration with no pressure loss.
Sanitary Sewer Piping:	Sewer system shall be tested for leakage per local jurisdiction requirements.

- D. Testing equipment, materials, and labor shall be furnished by contractor.

3.9 WATER SYSTEM STERILIZATION

- A. Public Water Mains: Shall be flushed and disinfected per the local jurisdiction requirements
- B. Clean and disinfect all site water systems connected to the domestic water systems in accordance with AWWA Standard C651 and as required by the local Building and Health Department Codes, and EPA.
 - 1. Clean and disinfect industrial water system in addition to the domestic water system.
 - 2. Disinfect existing piping systems as required to provide continuous disinfection upstream to existing valves. At Contractors option, valves may be provided to isolate the existing piping system from the new piping system.
- C. Domestic water sterilization shall be performed by a licensed "qualified applicator" as required by CAL-EPA Pesticide Enforcement Branch for disinfecting and sterilizing drinking water.
- D. Disinfecting Agent: Chlorine product that is a registered product with Cal-EPA for use in California potable water lines, such as Bacticide, CAL-EPA Registration No. 37982-20001.
- E. Contractor to provide a 1" service valve connected to the system at a point within 2'-0" of its junction with the water supply line. After sterilization is complete Contractor to provide cap at valve.
- F. Sterilization Procedure to be as follows:
 - 1. Flush pipe system by opening all outlets and letting water flow through the system until clear water flows from all outlets.

UTILITIES
SECTION 33 0000
3595001

2. Inject disinfecting agent to provide a minimum chlorine residual concentration of at least 50 parts per million (ppm) of free chlorine at each outlet.
 3. Provide sign at all outlets which reads "Water Sterilization in Progress – Do not operate". Remove signs at conclusion of test.
 4. Close all outlets and valves, including valve connecting to water supply line and 1" service valve. Retain treated water in pipe for a minimum of twenty-four hours. Should chlorine residual at pipe extremities be less than 50 PPM at this time, pipe shall be re-chlorinated. As an option, the water systems may be filled with a water-chlorine solution containing a minimum of 200 PPM of chlorine and allowed to stand for three hours.
 5. After chlorination, flush lines of chlorinated water and refill from domestic supply. Continue flushing until residual chlorine is less than or equal to 0.2 ppm, or a residual the same as that of the test water.
- G. Chemical and bacteriological tests shall be conducted by a state-certified laboratory and approved by the local authorities having jurisdiction.
- H. Submit written report to Health Department as required by State Regulations. Provide a copy of report to Architect prior to completion of project.
- I. The costs of sterilization and laboratory testing shall be paid for by the contractor.

3.10 CLEANING

- A. Upon completion of work of this Section promptly remove from the working area all scraps, debris and surplus material of this Section.

END OF SECTION

s:\master specifications\division 33 - utilities\33 0000_utilities.docx
Formatting Updated: 9-13-21

PART 1 - GENERAL

1.1 SUMMARY

- A. Summary Includes:
 - 1. Storm drainage piping systems.

1.2 RELATED REQUIREMENTS

- A. Section 01 5000, Construction Facilities and Controls.
- B. Section 01 6116, Volatile Organic Compound (VOC) Restrictions, for VOC limits pertaining to adhesives, sealants, fillers, primers, and coatings.
- C. Section 01 8113, Sustainable Design Requirements, for CAL-Green **[and Collaborative for High Performance Schools (CHPS)]** general requirements and procedures.
- D. Section 31 0000, Earthwork.
- E. Section 31 2333, Trenching and Backfilling.
- F. Section 32 1200, Asphalt Concrete Paving.
- G. Section 32 1600, Site Concrete

1.3 REFERENCES AND STANDARDS

- A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- B. California Green Building Standards Code (CAL Green), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
- C. California Plumbing Code, (CPC), edition as noted on the Drawings.
- D. Local Jurisdiction: Any work within the street, highway or right-of-way shall be performed in accordance with the requirement of the governmental agencies having jurisdiction, and shall not begin until all of those governing authorities have been notified.
- E. ASTM International (ASTM):
 - 1. D 422-63 Test Method for Particle Size Analysis of Soil.
 - 2. D698-00 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures, Using 5.5 lb (2.49 Kg) Rammer and 12 inch (304.8 mm) Drop.
 - 3. D1556-00 - Test Method for Density of Soil in Place by the Sand-Cone Method.
 - 4. D1557-02 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 10 lb. (4.54 Kg) Rammer and 18 inch (457 mm) Drop.

STORM DRAINAGE UTILITIES
SECTION 33 4000
3595001

5. D 3017-05 Test Methods for Moisture Content of Soils and Soil-Aggregate Mixture by Nuclear Methods (Shallow Depth).
6. D 4318-05 Test Method for Liquid Limit, Plastic Limit, and Plasticity Limit.

F. CALTRANS Standard Specifications.

G. CAL-OSHA, Title 8, Section 1590 (e).

1.4 ADMINISTRATIVE REQUIREMENTS

A. Submittal Procedures:

1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
3. Sustainable Design Submittals shall comply with the additional requirements of Section 01 8113, Sustainable Design Requirements.

1.5 ACTION SUBMITTALS

- A. Provide supplier's descriptive literature for all products to demonstrate compliance with specified attributes.
- B. Substitution: Provide all data of proposed material being submitted as a substitution. Provide comparison with specified product data and identify all differences. Failure to provide comparison will be reason for rejection.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: Contractor / installer.
- B. Provide sieve analysis from accredited testing lab on pipe bedding material. Analysis shall have a current date not older than project contract signing date.
- C. Sustainable Design:
1. General:
 - a. Submit information necessary to establish and document compliance with the California Green Building Standards Code.
 - b. Sustainable design submittals are in addition to other submittals.
 2. The following information shall be provided:
 - a. Adhesives and Sealants: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.
 - b. Paints and Coatings: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.

1.7 CLOSEOUT SUBMITTALS

- A. Guarantee: Submit subcontractor's guarantee.

1.8 QUALITY ASSURANCE

- A. Contractor / Installer shall have been in business for five (5) years providing/finishing similar size projects and complexity.
- B. Contractor shall be solely responsible for all subgrades built. Any repairs resulting from inadequate compaction are the responsibility of the contractor.
- C. The representatives of the Owner's testing lab will not act as supervisor of construction, nor will they direct construction operations. Neither the presence of the Owner's testing lab representatives nor the testing by the Owner's testing lab shall excuse the contractors or subcontractors for defects discovered in their work during or following completion of the project. Correcting inadequate compaction is the sole responsibility of the contractor.
- D. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.
 - 1. Sun damaged or discolored PVC pipe will be rejected.
- E. All materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.

1.9 DELIVERY, STORAGE AND HANDLING

- A. Transport, store and handle in strict accord with the local jurisdiction and manufacturer's written recommendations
- B. Deliver undamaged products to job in manufacturer's sealed containers and/or original bundles with tags and labels intact.

1.10 EXISTING SITE CONDITIONS

- A. Contractor shall acquaint himself with all site conditions. If unknown active utilities are encountered during work, notify Architect promptly for instructions. Failure to notify will make Contractor liable for damage to these utilities arising from Contractor's operations subsequent to discovery of such unknown active utilities.
- B. Existing civil, mechanical and electrical improvements are shown on respective site plans to the extent known. Should the Contractor encounter any deviation between actual conditions and those shown, he is to immediately notify the Architect before continuing work.

1.11 PROTECTION

- A. Adequate protection measures shall be provided to protect workmen and passers-by on and off the site. Adjacent property shall be fully protected throughout the operations.

STORM DRAINAGE UTILITIES
SECTION 33 4000
3595001

Blasting will not be permitted. Prevent damage to adjoining improvements and properties both above and below grade. Restore such improvements to original condition should damage occur. Replace trees and shrubs outside building area disturbed by operations.

- B. In accordance with generally accepted construction practices, the Contractor shall be solely and completely responsible for working conditions at the job site, including safety of all persons and property during performance of the work. This requirement shall apply continuously and shall not be limited to normal working hours.
- C. Any construction review of the Contractor's performance conducted by the Geotechnical Engineer is not intended to include review of the adequacy of the Contractor's safety measures, in, on, or near the construction site.
- D. Provide shoring, sheeting, sheet piles and/or bracing to prevent caving, erosion or gullyng of sides of excavation.
- E. Surface Drainage: Provide for surface drainage during period of construction in manner to avoid creating nuisance to adjacent areas. The contractor shall make a reasonable effort on a daily basis to provide pumps and all equipment necessary to keep all excavations and the site free from water during entire progress of work, regardless of cause, source, or nature of water.
- F. Adjacent streets and sidewalks shall be kept free of mud, dirt or similar nuisances resulting from earthwork operations.
- G. The site and adjacent influenced areas shall be watered as required to suppress dust nuisance. Dust control measures shall be in accordance with the local jurisdiction.
- H. Trees: Carefully protect existing trees that are to remain.

1.12 SEASONAL LIMITS

- A. No fill material shall be placed, spread or rolled during unfavorable weather conditions. When work is interrupted by rains, fill operations shall not be resumed until field tests indicate that moisture content and density of fill are satisfactory.

1.13 TESTING

- A. General: Refer to Section 01 4523 – Testing and Inspection Services, and Structural Tests and Inspections List, DSA-103.
- B. Geotechnical Engineer: Owner is retaining a Geotechnical Engineer to determine compliance of fill with Specifications, and to direct adjustments in fill operations. Costs of Geotechnical Engineer will be borne by Owner; except those costs incurred for re-tests or re-inspection will be paid by Owner and backcharged to Contractor.

1.14 RECORD DRAWINGS

- A. Keep a daily record of all pipe placed in ground, verified by Project Inspector.

STORM DRAINAGE UTILITIES
SECTION 33 4000
3595001

- B. Upon completion of this Contract, furnish one tracing showing all outside utility lines, piping, etc., installed under this Contract. Locate and dimension all work with reference to permanent landmarks.
- C. All symbols and designations used in preparing "RECORD" drawings shall match those used in Contract drawings.
- D. Properly identify all stubs for future connections, as to location and use, by setting of concrete marker at finished grade in the manner suitable to Architect.

PART 2 - PRODUCTS

2.1 DESIGN AND PERFORMANCE CRITERIA

- A. Sustainable Design:
 - 1. VOC emissions for field-applied adhesives, sealants, and sealant primers must comply with limits specified in Section 01 6116.
 - 2. VOC emissions for field-applied paints and coatings must comply with limits specified in Section 01 6116.

2.2 MATERIALS

- A. Pipe: Use one of the following, unless noted on the Drawings otherwise.
 - 1. Polyvinyl Chloride Pipe (PVC): SDR35 conforming to ASTM D3034 with elastomeric joints conforming to ASTM D3212 for pipe to 12". Sun damaged pipe will be rejected.
 - 2. High density polyethylene pipe (HDPE): The pipe shall be corrugated exterior/smooth interior pipe. 12" to 60" maximum diameter shall conform to AASHTO M294, water tight per ASTM D3212 with water tight gasket fittings.
- B. Perforated Pipe (for subdrains): Shall be ADS N12 pipe, 3 hole, ASTM F 405, AASHTO M 252; PCV ASTM D3034 SDR-35 storm drain pipe
- C. Manhole: Shall be as shown on the drawing details.
- D. Drop Inlet: Shall be as shown on the drawing details.
- E. Curb Inlet: Shall be as shown on the drawing details.
- F. Mortar: For pipe connections to concrete drainage structures, conform to ASTM C270 type N mortar. Place within one half hour after adding water.
- G. Crushed Rock: Imported washed crushed rock. Minimum 100% passing 3/4 inch sieve.
- H. Trench drain: Polycast, Polydrain or equal and as shown on drawings.
- I. Area Drains: Shall be as shown on the drawing details.

STORM DRAINAGE UTILITIES
SECTION 33 4000
3595001

- J. Floor Drains: Shall be as shown on the drawing details.
- K. Clean-outs: Shall be as shown on the drawing details.
- L. Planter drains: Shall be as detailed on the drawing details.
- M. Filter Fabric: Mirafi 140N.

PART 3 - EXECUTION

3.1 INSPECTION LAYOUT AND PREPARATION

- A. Prior to installation of the work of this Section, carefully inspect and verify by field measurements that installed work of all other trades is complete to the point where this installation may properly commence
- B. Layout all work, establish grades, locate existing underground utilities, set markers and stakes, setup and maintain barricades and protection facilities; all prior to beginning actual earthwork operations. Layout and staking shall be done by a licensed Land Surveyor or Professional Civil Engineer.
- C. Verify that specified items may be installed in accordance with the approved design.
- D. In event of discrepancy, immediately notify Owner and the Architect. Do not proceed in discrepant areas until discrepancies have been fully resolved.

3.2 EXCAVATION AND BACKFILLING

- A. General: Installation shall be in strict conformance with referenced standards, the manufacturer's written directions, as shown on the drawings and as herein specified.
- B. Verify invert elevations at points of connection to existing systems prior to any excavation. If invert elevations differ from that shown on drawings, notify Architect immediately.
- C. Excavation and Bedding:
 - 1. General: Trench straight and true to line and grade with bottom smooth and free of irregularities or rock points. Trench width in accordance with pipe manufacturer's recommendations and as per the drawings. Follow manufacturer's recommendations for use of each kind and type of pipe.
 - 2. Bedding: Provide bedding as detailed on plans for the full length of the pipe. Bedding shall have a minimum thickness beneath the pipe of 4" or 1/8 the outside diameter of the pipe, whichever is greater. Provide bell holes and depressions for pipe joints only of size required to properly make joint.
 - 3. If the trenches for the site drainage fall within areas to be lime treated, the piping shall be installed prior to any lime treatment operations.
 - a. If additional piping is added to previously lime treated areas, the contractor shall backfill the trench with class 2 aggregate base and compact to 95%.

D. Laying of Pipe:

1. General: Inspect pipe prior to placing. Set aside any defective or damaged material. Do not place pipe in water nor place pipe when trenches or weather are unsuitable. Lay pipe upgrade, true to line and grade.
2. Bell and Spigot Joints: Lubricate inside of bells and outside of spigots with soap solution or as recommended by manufacture. Wedge joints tight. Bell of bell and spigot pipe to be pointed upgrade.
3. Pipe shall be bedded uniformly throughout its length.
4. Pipe elevation shall be within 0.02 feet of design elevation as shown on plans.
5. Off Site Work: All work beyond the property lines shall be done in strict conformance with the requirements of the governing agency.

E. Backfilling:

1. General: Do not start backfill operations until required testing has been accomplished.
2. Trenches and Excavations: Backfill with material as detailed on plans, filling both sides of the pipe at the same time, carefully tamping to hold pipe in place without movement. Refer to Section 31 2333 – TRENCHING AND BACKFILLING for fill above this layer.

F. Grouting of Pipes: Grout pipes smooth and water tight at drop inlet, manholes, and curb inlets. Grout back side of hood at curb inlets all grouting shall be smooth and consistent.

G. Off Site Work: All work beyond the property lines shall be done in strict conformance with the requirements of the local agency.

H. Cutting and Patching: Remove and replace existing surface features per applicable specification section (i.e. asphaltic concrete or concrete paving) where pipe is installed in areas of existing improvements.

3.3 TOLERANCES

A. Storm Drain structure grates

1. In landscape and lawn areas $\pm 0.05'$.
2. In sidewalk and asphalt pavement $\pm 0.025'$.
3. In curb and gutter application $\pm 0.0125'$.

B. Cleanout Boxes and Lids

1. In landscape areas; 0.10 higher than surrounding finish grade, $\pm 0.05'$.
2. In sidewalks and asphalt pavement; Flush with surrounding finish grade, $\pm 0.025'$.

3.4 DEWATERING

A. Contractor to provide trench dewatering as necessary, no matter what the source is, at no additional cost to the owner.

STORM DRAINAGE UTILITIES
SECTION 33 4000
3595001

3.5 FLUSHING

- A. The Contractor shall thoroughly ball and flush the storm drain system to remove all dirt and debris. Discharge water to an approved location.

3.6 CLEANING

- A. Upon completion of work of this Section promptly remove from the working area all scraps, debris and surplus material of this Section.
- B. Clean the dirt, rocks, and debris from the drop inlets and storm drain manholes.

END OF SECTION